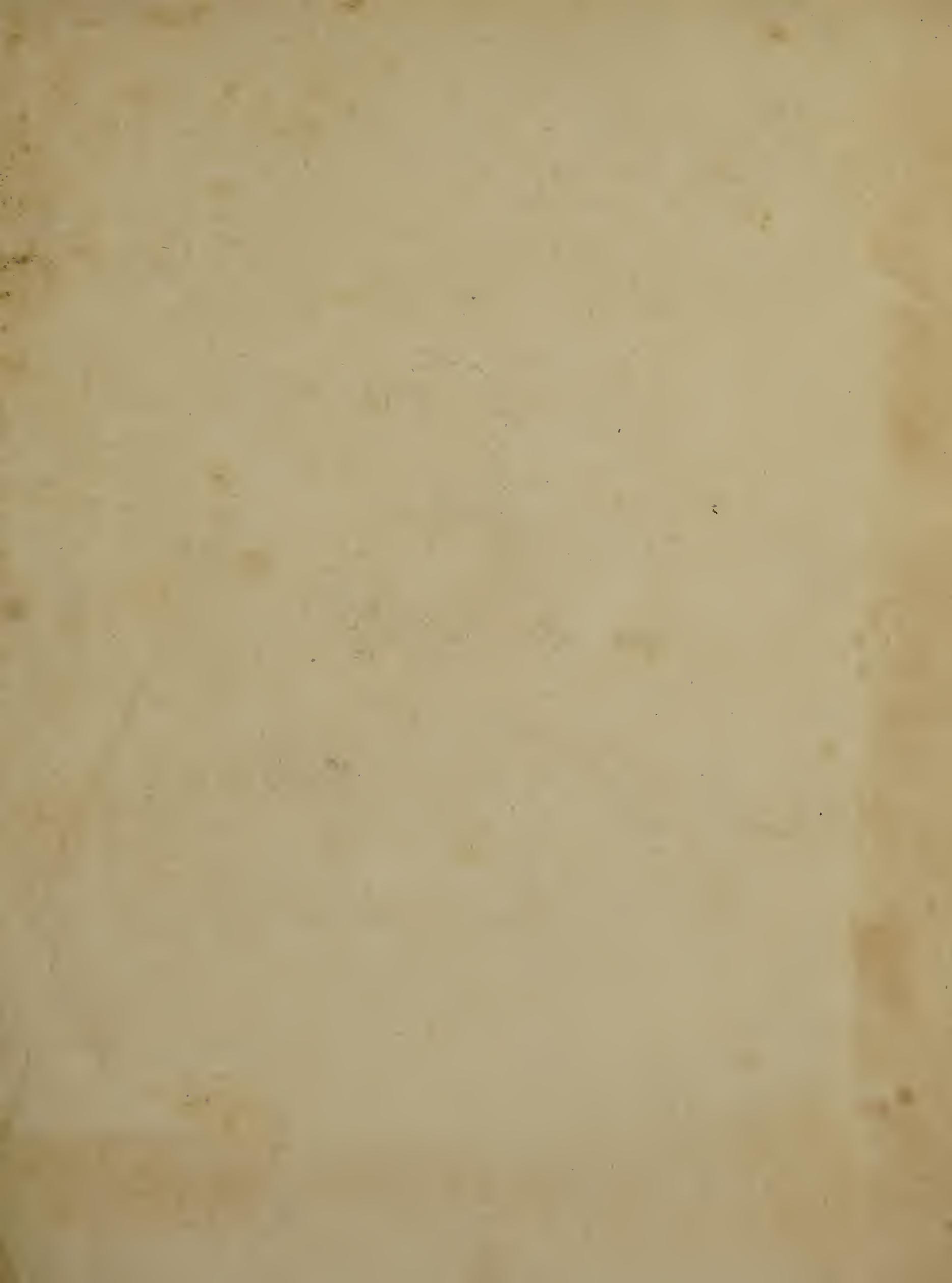


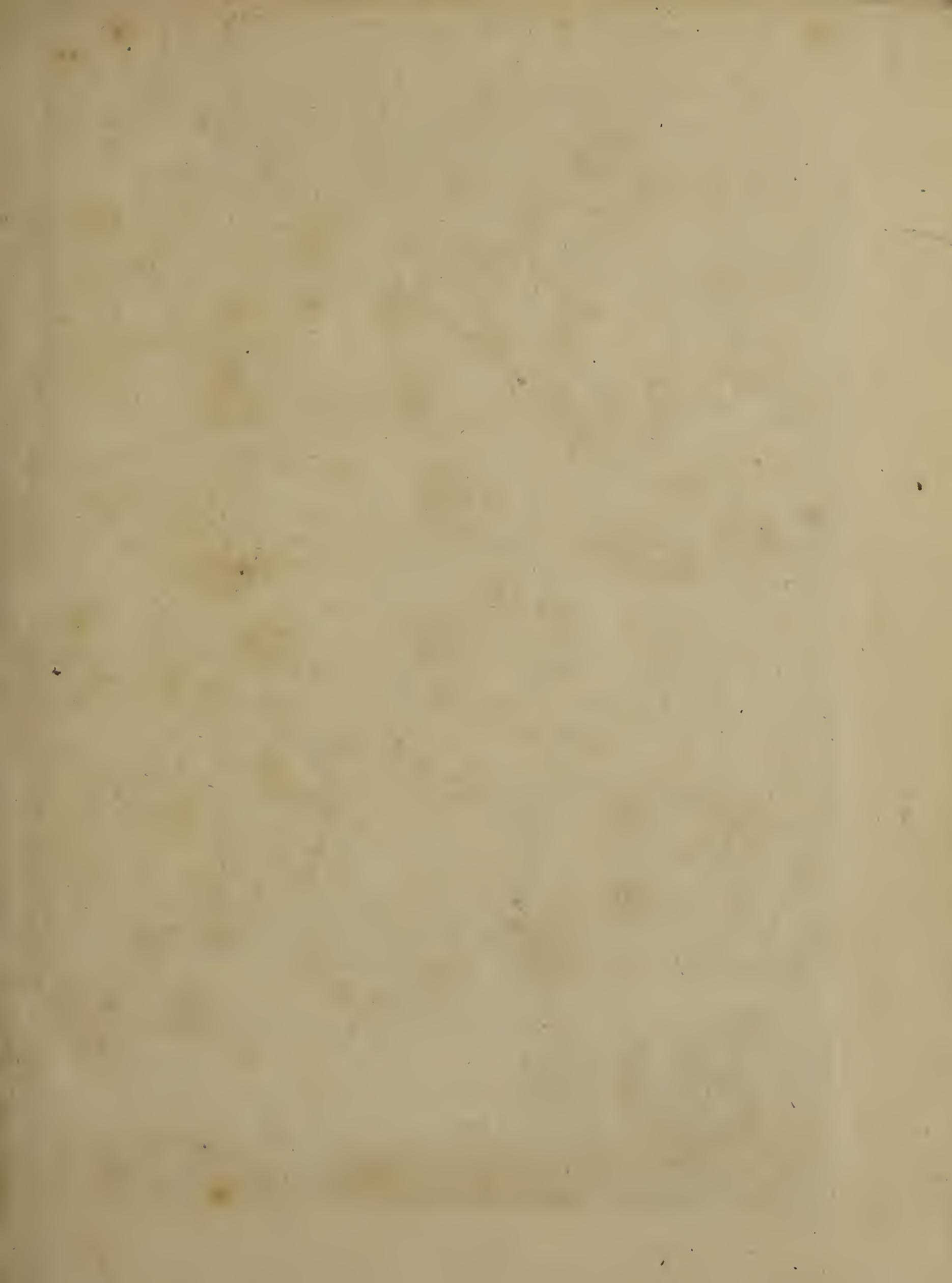
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DAUNTESEY,
Agescroft Hall.







S. Male invt et del.

*What NATURE sparing gives, or half denies,
See! healthfull INDUSTRY at large supplies.*

J. Miller Sculp.

*See! in BRITANNIA'S Lap profusely pours,
While heaven-born SCIENCE swells th'increasing Stores*

Ecce! ferunt Pueri Calathis Tibi Lilia plenis. VIRG.

THE

A B R I D G E M E N T

OF THE

GARDENERS DICTIONARY:

CONTAINING

The best and newest Methods of CULTIVATING and IMPROVING

THE

KITCHEN, FRUIT, FLOWER GARDEN, and NURSERY;

As also for Performing the

Practical Parts of *H U S B A N D R Y*:

Together with.

The MANAGEMENT of V I N E Y A R D S,

AND THE

METHODS of MAKING WINE in *E N G L A N D*.

In which likewise are included,

DIRECTIONS for PROPAGATING and IMPROVING,

From REAL PRACTICE and EXPERIENCE,

PASTURE LANDS and all Sorts of TIMBER TREES.

By P H I L I P M I L L E R, F. R. S.

Gardener to the Worshipful Company of APOTHECARIES, at their Botanick Garden at *Chelsea*,
and Member of the Botanick Academy at *Florence*.

... *Digna manet divini gloria ruris.* VIRG. Georg. I. v. 168.

The F I F T H E D I T I O N, Corrected and Enlarged.

L O N D O N,

Printed for the A U T H O R ;

And Sold by JOHN RIVINGTON, in *St. Paul's Church-yard*; A. MILLAR, J. WHISTON
and B. WHITE, H. WOODFALL, G. HAWKINS, J. HINTON, R. BALDWIN, L. HAWES
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M.DCC.LXIII.

T. J. B. ...

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TO HIS EXCELLENCY

HUGH, EARL OF NORTHUMBERLAND,

Lord WARKWORTH of Warkworth Castle,

Lord Lieutenant General and General Governor of the
Kingdom of *IRELAND*,

Lord Lieutenant and Custos Rotulorum of the Counties of MIDDLESEX
and NORTHUMBERLAND,

Knight of the Most Noble Order of the GARTER,

FELLOW OF THE ROYAL SOCIETY,

And one of the Lords of His MAJESTY'S Most Honourable Privy-Council,

This ABRIDGEMENT of the GARDENERS DICTIONARY,

Is, with the utmost Respect, inscribed, by

HIS EXCELLENCY'S most Faithful and

Obedient Humble Servant,

Philip Miller.

T H E
P R E F A C E.

THE last impression of the Abridgement of the Gardeners Dictionary, which was printed in three volumes octavo, having been long sold off, and there being yet a demand for the book, the author has been induced to publish this, which is abridged from the seventh edition in folio. But at the time he was preparing it for the press, several noblemen (for whose judgment the author had the highest regard) desired it might be printed in one volume in quarto, as they were of opinion it would be more eligible than several volumes in octavo; because the references from the *English* names to the *Latin*, or the former titles of the plants, which are here referred to those given by *Linnaeus*, would frequently occasion the turning from one volume to another, which when included in one volume would be avoided. This advice soon determined the author to print it in the manner it is now offered to the publick.

In the execution of the work, the author has been very careful not to omit any of the useful articles which are in the folio edition; and it is only the speculative parts, which are either abridged or wholly omitted. The *Latin* titles to each plant are here preserved, as being the most authentick, and therefore the more universally known; to which are added the *English* names: but where there are old *English* names to plants, by which they are more generally known among gardeners and others, who have not made botany their study, the author has chosen to adopt them, rather than to render the *Latin* titles into *English*. The synonymous titles which were added to the plants in the last folio edition are here omitted, that the work might not be too large.

The *Latin* titles of the plants are taken from Dr. *Linnaeus's* *Species of Plants*, as far as they are mentioned by that author; but there being many plants now cultivated in the *English* gardens, which are not inserted in his works, the author has given names to such as either are not to be found in *Linnaeus*, or where there is reason to believe that great botanist has not seen the plants growing, and therefore may have mistaken them.

Most of the writers on botany before *Linnaeus* have been fond of enumerating the varieties of plants, and several of them have put down varieties for different species, which had much confused the science; but *Linnaeus*, to avoid this, has too frequently gone into the opposite extreme, having, in many parts of his work, put down three or four different species, as one and the same plant. The only method to ascertain the species, is by long cultivating them from seeds; for when plants constantly keep their difference after twenty or thirty years growing from seeds, it cannot be doubted that they are distinct species.

The P R E F A C E.

The description of the species (the author believing it necessary, in order to distinguish such plants as have great resemblance to others) is here continued, but these are as much abridged as the nature of the work would admit; the particulars only being inserted in which their chief difference consists, and in every genus where there are remarkable varieties worthy notice, these are mentioned; because many of them are the greatest ornaments to the flower garden.

In treating of fruits, it is absolutely necessary to enumerate their varieties; for as most of the choice sorts have been improved by culture, the omitting the titles by which they are commonly known among gardeners, would be esteemed an unpardonable fault in a work of this kind; but in enumerating them, care has been taken not to enlarge the book, by long accounts of fruits, many of which deserve to be banished the gardens of such as have a delicate palate: therefore, the author has only recommended the best of each sort which has come to his knowledge. The directions also given, as to their choice, with the method of cultivating them thro' their different stages, are such as by long experience he has found to succeed best; and he is very certain, that whoever follows these directions, will, in a course of twenty years, find his advantage in it, whatever may have been the success of some late projects for five or six years.

The rules likewise for the management of all the esculent plants which are cultivated in the *English* gardens, are such as are now observed by those who are best skilled in the art of gardening; and where any late improvement has been made in these articles, they are carefully noticed: as also the cultivation of some roots in the open fields, which of late years have been greatly extended in *England*, and been found of very considerable benefit as a winter pabulum for cattle; as in those years when there has been a scarcity of the usual food, a supply of these roots has been of the greatest advantage to such as had store of cattle to maintain. Turneps have been long cultivated in *England* as winter fodder for cattle, and since their cultivation has been better known in the distant parts of the kingdom, have greatly improved estates; but seasons frequently happening in which these fail, every prudent person should endeavour to have a supply in case of accident. Of late years, the cultivation of two other roots has been introduced in some parts of *England*, which have fully answered this purpose; these are Carrots and Parsneps, two of the most valuable roots for fattening of cattle yet known: one acre of either of these will do more than three acres of Turneps, supposing each crop equally good; and there is scarce any cattle that will not prefer them to other food: but for swine, they are much better than any other sustenance, and the pork fatted with them the best. Another use has been made of these roots, which is the feeding of deer in parks during the winter and spring, when there is a scarcity of herbage; by this method the deer have been kept strong and sound, and so have been fat at least a month sooner than usual. The culture of both these roots is here fully treated of, with the method of preserving them through the winter for use; and it were to be wished, that such persons who have land proper for their growth would extend their culture.

The best instructions for improving natural pastures are also here given, with proper directions for laying down land which has been in tillage, so as to obtain as good sward as that of natural meadows; and likewise how to manage and improve artificial pastures, which is a part of husbandry with which the common farmers are little acquainted, though an article which deserves their greatest attention. The different methods of improving up-land, water-meadows and pastures, are also here included; the whole collected from several years experience, and not from theory, therefore the author can with safety recommend them.

The P R E F A C E.

In the articles relating to Corn of all sorts, as also in the culture of pulse, and other plants, which are sown in the open fields, several improvements are here mentioned, some of which it is to be feared will not be easily introduced, so as to become general; but however, as there is a spirit for improvements of this kind among persons of rank, it may be hoped if they begin the practice, their example may excite an emulation in their tenants and neighbours to follow them.

As the Timber of this nation is truly supposed its bulwark, so the cultivation, improvement, and preservation of it, are of the utmost consequence to the publick; yet it is greatly to be feared, that this has not been so properly attended to as it should have been, and especially by those to whom the care of the publick Timber has been entrusted; this therefore should rouse such as have large estates, to find out methods for supplying the nation with this valuable commodity, which may be done at a moderate expence, where proper care is taken in the first planting, and the after-management of Woods: in these articles the author hopes his directions will be found serviceable to all such as have inclinations and abilities to set about this work.

The directions here given for propagating all sorts of flowers being very full, it is presumed here will be found sufficient instruction to such as are desirous to improve these beauties; the choice of soils and situations for the flower-garden, and also for the nursery to raise forest-trees, fruit-trees and shrubs, is included under their several titles, whereby those who have but little experience may soon learn the methods of their culture.

As the author has been careful in this Abridgement, he hopes it will meet with the same favourable reception from the publick as his former works; for which he thinks he cannot better testify his gratitude, than by endeavouring, to the utmost of his abilities, to promote the pleasant and useful ART of GARDENING.

T H E

A B R I D G E M E N T

O F T H E

G A R D E N E R S D I C T I O N A R Y .

A B I



BELE Tree. See Populus.

ABIES, Tourn. Pinus, Lin. Gen. Plant. 956.
The Fir Tree.

The Characters of this genus are,

There are male and female flowers on the same tree; the male flowers have empalements of four leaves, without petals, many stamina, and naked summits. The female flowers, which are collected in a scaly cone, each scale covering two flowers, having neither petals or stamina, with one pointal, and are each succeeded by a winged nut. The distinguishing character of this genus, is the leaves arising singly from their base; whereas the Pines have two or more arising from the same point.

The Fir has always been separated from the Pine trees, by all the writers on Botany before Dr. Linnæus, and were generally distinguished therefrom, by their leaves being produced singly on the branches; the leaves of the Pines being produced by pairs, threes, or fives, out of sheaths which surround their base. And as this distinction is now well known among the nursery gardeners, so it is much better to keep them separate, than to join them with the Cedar of Libanus, and Larch tree to the Pine, as the doctor has done, making them of one genus.

The following Species are now in the English gardens;

1. ABIES foliis emarginatis, subtus glaucis, strobilis erectis scissilibus. The Silver or Yew-leaved Fir.

2. ABIES foliis subulatis mucronatis utrinque dispositis, strobilis pendentibus. The Spruce or Norway Fir, sometimes called the Pitch tree.

3. ABIES foliis subulatis subtus glaucis, utrinque dispositis, strobilis uncialibus laxis utrinque dispositis. The small coned American Spruce Fir.

4. ABIES foliis submarginatis, subtus glaucis, utrinque dispositis, strobilis uncialibus laxis. The white Spruce Fir of North America, called Newfoundland Spruce.

5. ABIES foliis submarginatis, bifariam dispositis, strobilis subrotundis. The American Hemlock Fir.

There are some other varieties of these trees, which have been raised in England, from seeds which came from North America; but as they are believed to be only accidental va-

A B I

riations, arising from the difference of soils and situations, I shall not pretend to put them down as different species, especially as several of them have not as yet produced cones in England.

The first sort grows naturally in many parts of Germany, but the finest trees of this sort, are growing upon mount Olympus, from whence I have received some of the cones, which were of an extraordinary size. The Strasburgh turpentine is drawn from this tree. The wood is white and soft, and therefore not greatly esteemed. The Balm of Gilead Fir is so near resembling this, as scarcely to be distinguished from it, after it is grown to a large size. The young trees have their leaves growing on every side their branches, by which they may then be easily known; but as the trees advance, so their leaves become ranged only on two sides of the branches, and approach nearer to the Silver Fir: the short duration of this tree in almost every soil and situation in England, has inclined many persons to believe it a distinct species; but as I have observed the same trees to alter after some years growth, so I shall suspend my judgment of this matter, until I can determine with greater certainty.

The second sort grows naturally in the low lands of Sweden, Norway, and Denmark, as also in many other parts of Europe. This is sometimes titled *Abies rubra*, i. e. Red Fir, which has given occasion to some persons to believe, that the red deals are cut from this sort; but we now can have no doubt of the contrary, for they are cut from the Scotch Pine, the wood of the Spruce Fir being white. The young branches of this Fir are used to make Spruce Beer in Germany, and from thence had the title of Spruce Fir.

The third sort grows naturally in many parts of North America, from whence the cones have been brought to England. The leaves of this sort are shorter than those of the Spruce Fir, but are in shape like them, their underside being of a glaucous green colour, the cones are loose, and about an inch in length.

The fourth sort is also a native of North America, where the inhabitants make three sorts of it, by the titles of Black, White, and Red Spruce. In England, these are mostly known by the title of Newfoundland Fir, because many of their

cones have been brought from thence; but the trees are found growing in most parts of *North America*. The Black Spruce grows commonly in swamps and bogs, and rarely rises to a great height. The White Spruce is an inhabitant of the mountains and higher lands, where it grows to a large size: and in the gardens of his Grace the late Duke of *Argyle* at *Whitton*, near *Hounslow*, there are some noble trees of this sort, which are not more than thirty-six years growth from seeds. By the difference in the growth of this and the Black Spruce, we may readily suppose them to be different species; but upon examining the old branches with their cones, they approach so near as to give suspicion of their being only varieties. The red sort, as it is called in *America*, I believe to be the same with the third; for the young plants which I have raised from the seeds brought to *England* by that title, are at present so like the third sort, as not to be distinguished from them.

The fifth sort is also a native of the same country; and in the northern parts of *America*, I am informed it grows to be a very large tree; but in *England* the branches spread wide every way, so that there is no appearance of the trees ever arriving to any considerable height. The leaves of this tree are short, and shaped very like those of the Yew tree; they are ranged on two sides of the branches only, so they appear flat, like those of the Silver Fir, but are of a pale green on both sides. The cones are small, loose, and roundish. What sort of wood this tree affords I cannot say, having never seen any trees of a size fit to cut down.

From most of these Firs, the inhabitants of *North America* collect a clear fragrant turpentine, which they use for curing green wounds; and the physicians there make great use of it internally: and it is generally supposed, that what is now sold under the title of balm of *Gilead* in *England*, is this turpentine.

All the sorts of Fir are propagated by seeds; the time for sowing them is about the middle of *March* when the season is mild, otherwise it had better be deferred till the end of that month, or the beginning of *April*. The seeds which are preserved in their cones will keep good, much longer than those which are taken out; but the cones of the Silver and Balm of *Gilead* Firs generally fall to pieces in the autumn, soon after the seeds are ripe; so that if they are not carefully watched, and gathered at that time, the seeds will be lost. The cones of all the sorts of Fir open with more ease than those of the Pines, and require but little trouble to get out their seeds. If they are spread on a cloth before a fire for a few hours, their scales will open, and emit the seeds.

The seeds may be sown in pots or boxes filled with light fresh earth, covering them over about half an inch thick with the same earth; these should be placed to an east aspect, where they may have the sun till eleven in the morning; or if the seeds are sown in a bed of earth, it should be shaded with mats in the middle of the day: for when they are too much exposed to the sun, the surface of the ground will dry so fast (especially in dry seasons) as to hinder the seeds from vegetating; and when the plants begin to appear, if they are not screened from the sun, many of them will be soon destroyed. The seeds must be carefully guarded against mice and birds, who are very fond of them, but particularly when the plants begin to appear; for as they thrust up the cover of the seeds on their top, so the birds in pecking off these covers, will destroy the young plants; therefore the surest method is to cover them with nets until the plants have thrown off their husks, and expanded their seed leaves, soon after which they will be out of danger.

The plants may remain in these places where the seeds were sown till the following spring, provided they are not stunted by the stiffness of the ground, or any other cause; if

so, they had better be carefully transplanted into new beds, about the beginning of *July*; but this must be done with great care, observing to raise the plants with a trowel, so as to preserve their roots as entire as possible, and to plant them again immediately, otherwise their tender fibres will soon become dry when exposed to the air at this season, and the plants thereby destroyed. The distance for planting these young plants should be four inches row from row, and about three inches asunder in the rows: for as these beds must be arched over with hoops, that the plants may be shaded with mats in the middle of the day, so the closer they are planted, there will be less trouble and expence in their covering; and as the plants are to remain in these beds no longer than the following year, so there will be room enough for their growth during that time. These young plants must be carefully weeded, for if weeds are permitted to grow among them of any size, there will be great danger of drawing the plants out of the ground with the roots of the weeds. If the season proves very dry, it will be of service to the plants to sprinkle them over with water once or twice a week during the hot time of the year: but this should be done with caution, for too much wet will rot the shanks of these young plants and destroy them.

These plants are very rarely hurt by frost in winter, especially those in the full ground; but such as are in pots or tubs are in more danger, if they stand upon the surface of the ground; for the frost will penetrate through the sides of the pots or tubs, and thereby may injure their roots. Therefore these should either be sunk into the ground before winter, or some old tanner's bark, straw, or mulch, laid round the pots or tubs to keep out the frost.

After the young plants have remained in the seed bed one year, they may be transplanted into beds the *April* following; but as these which were not transplanted in summer from the places where they were sown, may stand two years in the beds when transplanted, so they should be allowed more room than those which were removed the preceding summer. Therefore the rows may be from five to six inches distant, and the plants in the rows four inches asunder, observing to treat them in the manner before directed. When they have grown two years in these beds, they may then be transplanted into the nursery, placing them in rows at three feet distance, and in the rows a foot asunder. The best season for removing them is in *April*, just before they begin to shoot: though they may, and often are transplanted in autumn with success; but the other time is preferable, especially if there happens to be rain soon after, otherwise they will require watering once a week for about a month.

The smaller these trees are planted out where they are to remain, the greater will be their progress, and they will grow to a much larger size than those that are removed at a much greater age; but there are few persons who have patience to wait their growth, therefore frequently plant them at the height of six or eight feet, at which size they will transplant better than most other evergreen trees; but those which are so tall, will require support, otherwise they will be in danger of being blown down by the wind. And if trees of such sizes are to be carried to a distant place, it will be expensive; for unless they have large balls of earth to their roots, there will be great hazard of their growing; and these will require more water than young plants: so that upon the whole, planting of young trees, is much preferable and less expensive. Therefore, where there are large plantations to be made, planting the trees very young is the most eligible; for the expence of cleaning these young plantations, will not be equal to that of staking and securing tall trees: and the difference of the first price, together with the carriage of the latter, will be very considerable;

ble; beside, the former will in a few years outgrow the latter. I have myself made plantations of Firs of different ages at the same time, upon the same ground; and have always found that plants of two or three years old, have in ten or twelve years, been much the best of any in the plantations; and I dare say others, who have made the like experiment, have found the same success.

In the choice of the plants, if they are to be purchased from a nursery, they should not be taken from good land to plant in a poor soil; therefore the better way is to procure them from ground, as nearly like that into which they are to be planted as possible; or if it is worse, the plants will succeed better. Indeed, where large plantations of these trees are designed, it is much the better way to make nurseries on the same ground, where the trees should be raised from seeds; for this will be a great saving of expence, and as the distance will be small to remove them, so there will be little danger of their succeeding.

But as the wood of all the sorts of Fir yet known, is much inferior to that of the Pine, so it is not adviseable to make plantations of them for their timber; therefore they are only valuable for their beauty: so that when they are planted for ornament, they should be placed so far asunder, as to admit the free air between them, otherwise the lower branches will decay, and render the trees unsightly. The great beauty of these trees are in their pyramidal form, and being furnished with lateral branches from about seven feet above the surface of the ground to their top; and these branches should be well garnished with leaves: to obtain which, the trees should not be planted nearer than eighteen or twenty feet; for when they are closer planted, the under branches soon drop their leaves and decay; and if these branches are taken off, the trees never put out new ones to supply their place. The unskilful disposition of these trees, has brought them into disrepute with many persons; whereas, if they are properly placed, they may be made very ornamental to fine seats.

In pruning off the under branches to the designed height, there must be care taken, not to cut off too many branches at the same time; one tier of branches is full enough to be displaced in a year; and if every other year this is performed, it will be sufficient; and by this gradual method of pruning, the trees will not be much retarded in their growth. The best time for this operation is in the beginning of September.

The Silver Fir requires a deep strong soil, for if it is planted in a light ground it will make but little progress; and when it is planted in a shallow ground, as soon as the roots meet with obstruction, the trees generally decay. The largest trees of this kind which I have seen, were growing in a deep loamy soil; these were upwards of ninety feet high, and were furnished with branches from ten feet above the ground to their tops, which being well garnished with leaves, made a fine appearance.

The common Spruce Fir will thrive best on the same land, but this will also do well on light ground, where the other will make little progress, so is more generally planted in England: besides, it will thrive in soils and in situations where the other will scarce live; it is also of longer duration in England.

The third sort will succeed best on a moist soil, for in light dry ground it makes but little progress, nor does it make a good appearance where the soil is not proper for its growth.

The American Spruce Fir delights in light moist ground, where the trees grow to a large size, and make a beautiful appearance; and if they are allowed room for their lower branches to spread and extend, they will be garnished with them almost to the ground, forming themselves in a pyramidal figure.

The Hemlock Fir thrives best in a strong loamy soil; those which have been planted in light dry ground, have made but little progress, especially upward, their branches taking a lateral position: so that unless the upper shoot is trained to a stake to direct its upright growth, the leading shoot will turn on one side and become flat; but in a strong loam, I have seen some of these trees which have naturally grown upright. As there are none of these trees in England, which are arrived to a size fit to cut down, so we know little of the worth of this wood.

There are some persons who are fond of propagating Fir trees from cuttings, which if properly planted will take root, but the plants so raised will never arrive to near the size of those raised from seeds: they are also never inclined to an upright growth, sending out lateral branches, and becoming bushy, therefore this practice is not worthy of imitation; and unless for sake of the multiplying a curious sort, whose seeds cannot be procured, should never be attempted; nor should the inarching of one sort upon another be practised for the same reason: for the trees so propagated will be of slow growth, and of short duration.

ABROTANUM, *Tourn. Inst.* See Artemisia.

ABROTANUM *Fœmina.* See Santolina.

ABSINTHIUM. See Artemisia.

ABRUS. See Glycine.

ABUTILON, *Tourn. Inst.* 99. Sida, *Lin. Gen. Plant.* 674. Yellow or Indian Mallow.

The Characters of this genus are,

It hath a malvaceous flower, whose stamina and styles are united at their base in one body, forming a sort of column, having a single empalement: the fruit is composed of several capsules, which contain many seeds.

Dr. *Linneus* has joined the plants of this genus to the Malvinda of *Dillenius*, including them in the same genus, under the title *Sida*. But as the Malvinda has a fruit with five capsules or cells, each containing one seed, and the fruit of *Abutilon* has many capsules and seeds, so I believe it to be right to separate them, especially as there are many species of each.

The Species of this genus now in the English gardens are,

1. ABUTILON *foliis subrotundo-cordatis acuminatis crenatis.* The common Yellow Mallow.

2. ABUTILON *foliis cordatis crenatis, capsulis scabris calyce longioribus.* The Indian Yellow Mallow.

3. ABUTILON *foliis oblongo-cordatis, inaequaliter crenatis pedunculis petiolo longioribus.* American Yellow Mallow with oblong heart-shaped leaves, and the footstalks of the flowers longer than those of the leaves.

4. ABUTILON *foliis ovato-cordatis acuminatis rugosis, floribus in thyrso terminalibus.* Yellow Mallow with oval heart-shaped rough leaves, and flowers disposed in a loose spike at the end of the branches.

5. ABUTILON *foliis cordatis subrotundis tomentosis petiolatis, pericarpis inflatis crenatis repandis.* Yellow Mallow, with downy roundish heart-shaped leaves having footstalks, and swollen covers to the fruit, which are crenated and turn backward.

6. ABUTILON *foliis cordatis acuminatis crenatis sessilibus, pericarpis inflatis tomentosis pedunculo geniculato.* Yellow Mallow, with heart shaped pointed leaves which are notched on their edges, sitting close to the stalk, and a downy swollen cover to the fruit, having a jointed footstalk.

7. ABUTILON *foliis hastatis glabris, floribus solitariis erectis, pedunculis petiolisque pilosis.* Yellow or Indian Mallow, with smooth halbert-pointed leaves, flowers standing singly and upright, with hairy footstalks to the leaves and flowers.

8. ABUTILON *foliis lobatis acutis, crenatis, subtus tomentosis, floribus terminalibus, caule fruticoso lanuginoso.* Indian

Mallow with sharp-pointed lobed leaves, woolly on their under side, flowers terminating the branches, and a downy shrubby stalk.

The first sort grows naturally in many parts of *North America*, from whence the seeds are frequently sent to *England*. It is an annual plant, which in good ground will rise four or five feet high, sending out many branches: the leaves are soft to the touch, the flowers small, of a yellow colour, so make no great appearance. The inhabitants of *North America*, use this plant for the Marsh-mallow. If the seeds of this plant are sown in a border in the spring, where the plants are to remain, they will require no other care but to keep them clean from weeds, and thin them where they are too close; and if the seeds are permitted to scatter, the plants will come up the following spring without care, and after the seeds are ripe they decay.

The fourth sort grows naturally on moist land in the *West Indies*, where it rises with a shrubby stalk, five or six feet high, sending out branches on every side, which are garnished with rough heart-shaped leaves: the flowers are disposed in loose spikes at the end of the branches, they are yellow, and shaped like those of the Mallow. This sort is propagated by seeds, which must be sown on a hot-bed, and the plants must be kept in a moderate warmth, otherwise they will not thrive in this country. The plants will continue two or three years, and produce flowers and fruit.

The eighth sort grows naturally in the *Bahama Islands*, from whence the late Mr. *Catesby* brought the seeds. It rises with a shrubby stalk to the height of seven or eight feet: the stalks are covered with a white down, the branches are garnished with leaves, having four or five lobes ending in sharp points, which are downy on their underside; the flowers are purple, and grow in loose clusters at the end of the branches. This sort is propagated by seeds, which should be sown on a moderate hot-bed; the plants must be put into pots when they are fit to transplant, and gradually inured to the open air, to which they should be exposed in summer; but in winter they must be placed in a good green-house, to secure them from frost. The plants will flower and produce seeds the second year; but will continue several years, if they are carefully managed.

All the other sorts are annual plants, which grow naturally in several parts of the *West Indies*, from whence their seeds have been brought to *England*. The seeds of these should be sown on a moderate hot-bed in the spring, and when the plants are fit to remove, they should be transplanted on another hot-bed, to bring them forward; but as the weather becomes warm, they must be hardened gradually to bear the open air; and toward the middle of *May*, if the season proves favourable, they may be taken up with balls of earth to their roots, and planted in the open borders, observing to shade and water them until they have taken new root; after which time they will require no farther care, than to keep them clean from weeds. In *June* they will begin to flower, and there will be a succession of flowers, until the cold in autumn puts a stop to them. The seeds ripen in the autumn, which should be gathered as they ripen, otherwise they will scatter.

ACACIA, *Tourn. Inst. Mimosa, Lin. Gen. Plant. 597.* The Egyptian Thorn, or Binding Bean tree.

The Characters of this genus are,

It hath male and hermaphrodite flowers collected in the same head: the male flowers have their empalements ending in five points; they have one tubulous petal, cut at the brim into five segments, and have several stamina. The hermaphrodite flowers have the same empalements and petals, with five stamina and one pointal, which afterward becomes a cylindrical pod.

Dr. *Linnaeus* has joined the *Acacia*, *Inga* and *Mimosa* together, including them in the same genus, under the title of

Mimosa. But as there are many species of *Acacia*, and that being an old medicinal title, which is still known in the shops, so it is much better to separate them, especially as there is a characteristic difference in their pods, than to join them to the *Mimosa*, of which there are also many distinct species now known in *Europe*.

The Species of this genus which we now have in the *English* gardens are,

1. ACACIA *foliis bipinnatis, foliolis aequalibus glabris, spinis geminis rectis.* *Acacia* with winged leaves, whose lobes are smooth and equal, and upright thorns by pairs.

2. ACACIA *foliis bipinnatis, foliolis exterioribus minoribus, caule aculeato.* *Acacia* with winged leaves, whose outer lobes are the least, and a prickly stalk.

3. ACACIA *foliis bipinnatis, foliolis subaequalibus spinis longis geminis rectis.* *Acacia* with winged leaves, whose lobes are almost equal, and long upright spines by pairs on the stalks.

4. ACACIA *spinis geminis patentibus foliis bipinnatis, foliolis linearibus aequalibus.* *Indian Acacia* of the *Farnese* garden.

5. ACACIA *inermis, foliis bipinnatis, foliolis linearibus glabris, floribus paniculatis, siliquis ad singula grana tumidis.* *Acacia* without thorns, winged narrow smooth leaves, and flowers disposed in panicles.

6. ACACIA *inermis, foliis bipinnatis numerosissimis, floribus globosis axillaribus.* *Acacia* with double winged leaves, having many lobes, and globular flowers rising at the wings of the stalk. 11. Dictionary.

7. ACACIA *spinis axillaribus geminis connatis, foliis bipinnatis, floribus spicatis.* Large horned *Acacia* with spiked flowers.

8. ACACIA *spinis axillaribus geminis connatis, foliis bipinnatis, floribus globosis.* Large horned *Acacia* with globular flowers. 3d Dictionary.

9. ACACIA *foliis bigeminis obtusis, spinis geminis axillaribus, floribus paniculatis staminibus longissimis.* *Acacia* with two pair of lobes to each leaf, commonly called *Doctor Long*, or *Cat's Dung*, in the *West Indies*. 5th Dictionary.

10. ACACIA *foliis bipinnatis bijugis, foliolis interioribus minoribus, petiolo lineari.* *Acacia* with double winged leaves, having two pair of lobes, the inner being smallest, and a linear stalk.

11. ACACIA *foliis conjugatis pinnatis, foliolis aequalibus, stipulis spinosis.* *Acacia* with conjugated winged leaves, whose lobes are equal, and thorny stipulae.

12. ACACIA *inermis, foliis bipinnatis, foliolis exterioribus majoribus, siliquis tumidis.* *Acacia* without thorns, doubly winged leaves, whose outer lobes are largest, and thick blunt pods.

13. ACACIA *spinis solitariis incurvis, foliis bipinnatis, floribus spicatis.* *Acacia* with single incurved spines, doubly winged leaves, and spiked flowers.

14. ACACIA *aculeata, floribus polyandris spicatis, legumine compresso laevi elliptico.* *Adanson.* Prickly *Acacia*, with spiked flowers having many stamina, and smooth compressed elliptical pods; or the true *Acacia* from which the *Gum Senegal* is taken.

15. ACACIA *spinis geminis approximatis, foliis bipinnatis, partialibus bijugatis.* *Acacia* with twin spines near each other, double winged leaves, whose wings have two pair of lobes.

The three first sorts grow naturally at the *Cape of Good Hope*, from whence the seeds are brought to *Europe*; and the plants are now in many gardens in *England* and *Holland*. These plants are not so tender as most of the other sorts, so may be preserved in a good green-house in winter, and exposed to the open air in summer. They retain their leaves all the year; but as there are not at present

any plants of an age fit for flowering, we can say nothing of their beauty as yet, but their leaves make a good appearance, and add to the variety in the green-house.

All the other sorts are natives of warmer countries, and cannot be kept in *England* through the winter without artificial heat: therefore those who have not the conveniency of a stove to preserve them, must not attempt to raise them here: for although they may grow very well in summer, yet on the first approach of winter, they will lose their leaves, and soon after decay.

They are all of them propagated by seeds, which do not ripen well in *England*, so should be procured from the countries where they grow naturally; and should be sown in small pots filled with light earth, early in the spring, which pots should be plunged into a hot-bed of a moderate temperature of heat; where (if the seeds are good) the plants will appear in about a month or five weeks after; then they should have gentle waterings two or three times a week, and fresh air should be admitted to the plants every day when the weather is warm, which will greatly strengthen them. When the plants are about three inches high, they should be each planted into a single small pot, filled with light earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them every day when the sun is warm, until they have taken new root; after which they should have fresh air admitted to them, by raising of the glasses, in proportion to the warmth of the season; and they should be gently watered, when the earth of the pots is dry; but as the greater part of these plants do not draw up the moisture very fast, so they should not have too much wet.

As the plants advance in strength, they should have a greater share of air admitted to them; and when they have filled the pots with their roots, they should be shifted into pots of the next size to those in which they were before growing; but they must not be over-potted, for they will not thrive in large pots; nor if the earth is stiff will they make much progress, for they generally grow in light sandy earth.

When the plants have acquired strength, they may be exposed to the open air, during the warm season in summer, which seldom continues much longer than two months, *viz.* from the end of *June* to the end of *August*; during which time they should be placed in a warm situation, where they may be defended from strong winds: and soon after they are placed in the open air, they should be shifted into fresh earth, that they may be well rooted before the cold comes on in the autumn, for they must then be removed into shelter: those sorts which are the most tender should be first taken in, which are the seventh, eighth, ninth, tenth, eleventh, thirteenth and fourteenth sorts; the fourth, fifth, sixth, twelfth and fifteenth sorts may remain longer abroad, if the weather is favourable. The former sorts should be placed in a warm stove in winter, otherwise they will not thrive; but if the latter are placed in a stove kept in a moderate temperature of warmth, they will succeed very well. But the three first sorts being less tender, may remain longer in the open air; and if they are placed in a warm green-house in winter, they will do better than in a greater warmth.

All these plants may be treated with less tenderness as they acquire strength; therefore as they advance in their growth, so they should be gradually hardened: but this must be done with caution, and great care should be taken, not to let them have too much wet.

The fourteenth sort produces the Gum Senegal, of which there are great quantities consumed in *Europe*: and it is from the same tree the Gum Arabick is collected in other countries, as Mr. *Adanson* has mentioned in his *History of Senegal*. This sort is not only common in *Africa* and in *Egypt*,

but grows naturally in many parts of *India*, from whence I have frequently received the seeds. It is easily distinguished by the pods, from all the other *Acacias*, these having several isthmus in which the seeds are lodged.

The fourth sort grows naturally in both *Indies*, and also in *Africa*, and is frequently cultivated in gardens in many parts of *Europe*, for the fragrance of its flowers, which are collected into large globular heads; they are of a bright yellow colour, and very agreeable scent; these are produced from the side of the young branches, at the insertion of the leaves: so that as the shoots extend in length, new flowers are produced, whereby (in warm countries) the trees continue flowering two or three months, but in *England* there are few plants old enough for flowering: they are too tender to live through the winter in a common green-house; and if they are too much drawn in a stove, they are apt to grow weak, so rarely flower. The only method to have these trees succeed in *England*, is to keep the plants in a moderate stove in winter, where they may have air in warm mild weather, and in cold damp weather secured by a fire from both; and in the summer place them in an airy glass-case, where they may be sheltered from cold and wet, and in warm weather let them have a great share of air; for if they are placed in the open air, the summers are generally too cold for these trees; and when they are kept too close in a stove, they run up weak, so rarely produce any flowers: but by the other method I have had them produce their flowers in plenty, when the plants were of a proper age.

The other sorts are frequently preserved in the gardens of the curious for the sake of variety, some of which have frequently flowered and perfected their seeds in *England*, when they have remained in the bark stove during the whole year; but there should be particular care taken in this case, not to draw the plants so as to make them very weak.

The seventh and eighth sorts produce very large thorns upon their stems and branches, some of which were brought me from *Campeachy*, which are five or six inches long, and as large as a goose-quill; they are greatly twisted cross each other so as to make an odd appearance, having more resemblance to a work of art, than of a natural production, when separated from the tree. This sort is frequently destitute of leaves for two or three months.

ACACIA, the Common *American*. See *Robinia*.

ACAJOU, or CAJOU. See *Anacardium*.

ACALYPHA. Three-seeded Mercury.

There are three species of this genus of plants, which are preserved in curious botanic gardens for the sake of variety; but as they have no great beauty, or of any use, so they are rarely propagated in other gardens, therefore are not inserted here, as the enumeration of such plants would swell the work beyond the bounds intended.

ACANTHUS, *Tourn. Inst. Lin. Gen. Plant.* 711. Bear's-breech.

The *Characters* of this genus are,

The empalement of the flower is two-leaved and bifid; the petal has but one lip, which is turned backward, and is divided into three at the end. The capsule has two cells, each containing one seed. It is of the ringent class of flowers, whose seeds are in a capsule. In the second division of *Linnæus's* fourteenth class.

The *Species* of this genus now in the *English* gardens are,

1. ACANTHUS foliis sinuatis inermibus obtusis. Smooth Bears breech with sinuated obtuse leaves, or the common Official Bear's-breech.

2. ACANTHUS foliis sinuatis inermibus lucidis, laciniis acutis. Smooth Bear's-breech with sinuated shining leaves, having acute points.

3. ACANTHUS foliis pinnatis acutis subspinosis. Bear's-breech with acute winged leaves, having soft prickles.

4. *ACANTHUS foliis pinnatis lucidis spinosissimis*. Prickly Bear's-breech with shining winged leaves.

The first sort is the common *Acanthus*, whose leaves are taken for the ornaments of the *Corinthian* capital, and is the sort which is used in medicine. It grows naturally in *Italy*, *Sicily*, and the *Levant*.

The second sort grows naturally in *Portugal*. The leaves of this are much larger than those of the first, and are less jagged; the cuts of the leaves are more pointed, and the upper surface is lucid. This is not a variety, for the seeds constantly produce the same kind.

The third sort grows naturally in *Italy*; the leaves of this are cut into acute segments, and are shaped like winged leaves, each segment terminating with a short soft spine. The flower-stalks of this sort, rise considerably higher than those of the former sort.

The fourth sort hath large shining winged leaves, which are armed with strong spines at the end of each segment, which renders it very troublesome to handle the leaves; the flower-stalks of this rise as high as those of the third sort. This grows naturally in the *Archipelago*.

These plants have all of them thick fleshy roots, which strike deep in the ground; and those of the third and fourth sorts creep in the ground to a considerable distance, that it is difficult to keep them within proper compass. They are also less tender than the first and second sorts, so are rarely injured by the greatest cold in *England*; whereas the former are killed in severe winters where they are exposed in an open situation, therefore require a warm situation and a dry soil. These plants frequently perfect their seeds in *England*, so they may be propagated by sowing them in a bed of light earth in the spring, where the plants generally appear in about six weeks after; and if they are kept clean from weeds, it is all the care they require the first summer: but in the winter, the plants of the first and second sorts will require some protection, especially if the weather should be very sharp; therefore they should be covered with mats, pease-haulm, or some other light covering, when the frost is severe, but the covering should always be removed in mild weather.

About the beginning of *March*, if the season is mild, the young plants should be carefully taken up, and transplanted in the places where they are designed to remain. Those of the two first sorts should have a warm situation and a dry soil; they must also be covered in winter if the frost is severe, for a year or two, till they have obtained strength enough to resist the cold: but the other may be planted in the open border, where, if the ground is not too wet, they will thrive and flower very well.

But as the plants which are raised from seeds seldom flower till the third year, so few people care to wait so long, therefore generally propagate them by offsets from the roots; these are produced in great plenty by the third and fourth sorts, which send them out to a considerable distance from the mother plant, so may be had in great abundance: but the first and second sorts do not increase near so fast, therefore are less common in the *English* gardens than the other. The offsets of all these sorts, should be taken from the old plants in *March*, when the danger of the hard frost is over; for if very severe frost should happen soon after their removal, it will kill them, especially those of the two first sorts.

When the plants have taken good root in the places where they are designed to remain, the only culture they will require, is to keep them clean from weeds; and when they shoot up their flower-stalks, to put down stakes and fasten the stalks to them, to prevent their being broke down by the wind, for they generally grow four or five feet high, and their flowers being large, become heavy; but when the

seeds are formed, they are commonly too weighty for the stalks to support them. The two last sorts should have their offsets frequently taken off, to keep them within bounds.

ACER. The Maple tree. In *French*, *Erable*.

The *Characters* of this genus are,

It hath hermaphrodite and male flowers on the same tree; the hermaphrodite flowers have an empalement of one leaf, cut into five parts: the corolla has five petals, they have five stamina and one pointal: the flowers are succeeded by two winged capsules joined at their base; each including a single seed. The male flowers have the same characters but have no style, so are not fruitful.

The *Species* are,

1. *ACER foliis quinquelobis inæqualiter serratis, floribus racemosis*. *Lin. Sp. Pl.* 1054. The greater Maple, falsely called Sycamore.

2. *ACER foliis lobatis obtusis emarginatis*. *Lin. Sp. Pl.* 1055. The common or lesser Maple.

3. *ACER foliis compositis, floribus racemosis*. *Hort. Cliff.* 144. The Ash leaved Maple.

4. *ACER foliis quinquelobis acuminatis acute dentatis glabris floribus corymbosis*. *Lin. Flor. Suec.* 303. The *Norway* Maple.

5. *ACER foliis quinquelobis sub iis dentatis, subtus glaucis pedunculis simplicissimis aggregatis*. *Lin. Sp. Plant.* 1055. The *Scarlet* flowering Maple.

6. *ACER foliis quinquepartito-palmatis acuminato dentatis*. *Lin. Sp. Pl.* 1055. The *American* Sugar Maple.

7. *ACER foliis trilobis acuminatis serrulatis, floribus racemosis*. *Lin. Sp. Pl.* 1055. The *American* Mountain Maple.

8. *ACER foliis trilobis integerrimis*. *Prod. Leyd.* 459. The *Montpelier* Maple.

9. *ACER foliis subtrilobis serrulatis*. The *Cretan* Maple.

The first sort grows naturally in the mountains in *Germany*, but is now so common in *Britain*, as to be by some supposed to be indigenous here; for the seeds have been carried by the winds to a great distance from the trees, and the plants have risen in great plenty without care, in all places which are fenced from cattle, in the neighbourhood of the trees; so that there is generally a supply of young plants from scattered seeds without any trouble, and this may have misled many persons, to believe the tree is a native of this country.

This sort grows to a tree of a large size; the wood is soft and very white, so is used by the turners, but is not esteemed very valuable for other purposes. But as this tree will thrive better than most other sorts near the sea, so it is frequently planted to screen plantations of other sorts of trees from the spray of the sea.

The second sort is very common in most parts of *Europe*, and is generally believed to be a native of this country. The wood is very hard, so is used for gun-stocks and several other purposes; but this sort never grows to a large size.

The third sort, which is commonly known by the title of *Ash leaved* Maple, is a native of *North America*, but is now very common in the *English* gardens. It is of quick growth; the trees often make shoots of eight or ten feet long in one year, but the wood is soft, and the branches of these trees are frequently split off by strong winds in the summer, when they are clothed with leaves, if they are in an exposed situation. These trees abound with a sweet sap early in the spring, which, if collected, by tapping their stems at that season, and boiling it, a tolerable good sugar is produced in *North America*; but the sixth sort is that, which the inhabitants of that part of the world usually tap for that purpose. From the first sort here mentioned, *Dr. Lister* procured some sugar after the same manner in *England*; and I believe if the sap of some other species were tried, there

there might be a coarse sort of sugar produced, as there might also by boiling the sap of the Birch tree.

The fourth sort grows naturally in *Norway*, *Sweden*, and other northern parts of *Europe*; it rises to a good height, and is well furnished with branches, which are garnished with large smooth leaves of a lucid green, which are divided in shape of a hand. These have an acrid milky juice; so are rarely eaten by insects; whereas those of the first sort are frequently eaten full of holes; which render them very unfightly; for which reason, the trees have been generally neglected of late years. This fourth sort will thrive as well near the sea as the first, so is much preferable to it.

The fifth sort is a native of *North America*, from whence the seeds were brought to *England*. This is cultivated in gardens for the beauty of its red flowers, which appear early in the spring; they are formed in roundish bunches, at the bottom of the foot stalks of the leaves. There is a variety of this, which is commonly called *Sir Charles Wager's Maple*, whose flowers are produced in much larger clusters than those of the common sort, and are placed closer upon the branches; so the trees make a much better appearance than the former, though I believe it to be only a variety from it. This sort never grows to a large size in *England*.

The sixth sort is what the inhabitants of *North America* generally tap for the juice, which they boil to obtain a coarse sort of sugar, so is distinguished from the other sorts by the title of *Sugar Maple*. The leaves of this sort have some resemblance to those of the fourth sort, but are not so lucid, and are frequently eaten by insects like those of the first sort, therefore this tree is seldom cultivated for beauty. It grows large, and the wood may be used for the same purposes as those of the other species.

The seventh sort hath some appearance of the sixth, but the leaves are more pointed.

The eighth sort is a tree of low growth, never rising to a greater height than our *Lesser Maple* in its native soil. The leaves are of a thick substance, divided into three intire lobes, and are of a lucid green; they continue in beauty till late in the autumn.

The ninth sort grows naturally in the islands of the *Archipelago*; the leaves of the young plants of this sort are oval and entire, but as they advance their leaves become in shape like those of the *Ivy*; they are not of so thick consistence as those of the eighth, but are of a lucid green: and in places where the trees are well sheltered from cold, the leaves continue green most part of the year, especially while the trees are young. This sort will endure the cold of our winters in the open air.

All the sorts of *Maple* may be propagated by cuttings, which in dry ground should be planted in the autumn; but where the land is moist and cold, the spring season is preferable; if they are cut from the trees before the buds begin to swell, and the ground is not then fit to receive them, they may be wrapped in moss, and put in a cool place, where they may be kept a month or five weeks without injury, as I have frequently experienced; so that these cuttings, will bear transporting from one country to another very well. But the trees which are raised from cuttings are not so valuable as those which are propagated by seeds, because they seldom grow so large, nor so upright.

The seeds of all the sorts of *Maple* should be sown in the autumn, soon after they are ripe, for if they are kept dry till the spring, they often fail, or at least lie a whole year in the ground before they vegetate. Therefore if they cannot be sown in the autumn, they should be put into sand to preserve them, and the sand and seeds sown together early in the spring upon a common bed of earth. When the plants come up, they must be kept clean from weeds, and in the following autumn transplanted into the nursery, where they

may grow two or three years, and then may be planted where they are to remain.

ACETOSA. Sorrel. *Rumex*, *Lin. Gen.* 407.

The Characters are,

It hath male and hermaphrodite flowers on the same plant in some of the species, and in others they are on different plants; the flowers have a three-leaved empalement, and have six stamina; the hermaphrodite flowers have a three-cornered style, and these are succeeded by a three-cornered seed.

The Sorrels and Docks are by *Dr. Linnaeus* included in the same genus, under the title of *Rumex*; but as the old name of *Acetosa* or *Sorrel* is better known by physicians and in the gardens, so I have continued it under the old title.

The Species are,

1. ACETOSA floribus dioicis, foliis oblongis sagittatis. The Common Sorrel.

2. ACETOSA floribus dioicis, foliis lanceolato-hastatis. Sheeps-Sorrel.

3. ACETOSA floribus hermaphroditis, foliis cordato-hastatis. Round-leaved Garden, or Roman Sorrel.

4. ACETOSA floribus hermaphroditis digynis. *Westmoreland* Sorrel.

5. ACETOSA floribus hermaphroditis geminatis, valvularum alis maximis membranaceis reflexis, foliis indivisis. *American* Annual Sorrel.

6. ACETOSA floribus hermaphroditis distinctis, valvularum alis maximis membranaceis, foliis crotis. *Egyptian* Sorrel with Rose-coloured bladders.

7. ACETOSA floribus dioicis, valvulis lævibus, caule arboreo, foliis subcordatis. The Sorrel tree.

The first sort grows naturally in pasture lands in most parts of *England*, but is also cultivated in gardens for culinary uses. It is a perennial plant, so will continue many years without renewing, provided the roots are planted at a sufficient distance to allow room for digging the ground between the rows.

The second sort grows naturally upon dry banks, and on gravelly ground in most parts of *England*, where by its creeping roots, it spreads over the land, and is often a very troublesome weed, so is rarely admitted into gardens.

The third sort is cultivated in gardens for use, and is a much better plant for the kitchen than the common Sorrel. This spreads and increases greatly by its creeping roots, so should be planted at a good distance, and in a stony soil, will do much better than in rich land.

The fourth sort grows naturally in the northern counties of *England*, in *Wales*, and *Scotland*; it is a low plant with creeping roots, the leaves are thick in proportion to their size, and are of a glaucous colour. It is rarely propagated in gardens.

The Annual *American* Sorrel is kept in some gardens for the sake of variety, but is not of any use. It grows naturally in *America* and *Egypt*.

The sixth sort grows naturally in *Egypt*; it is an annual plant, the bladders covers of the seeds are of a fine Rose-colour. This is kept in gardens for variety, but is not cultivated for use.

The seventh sort grows naturally in the *Canary Islands*. This rises with a strong woody stalk to the height of ten or twelve feet. It is frequently kept in gardens here, but must be housed in winter, for it will not live abroad in any country where there are hard frosts in winter. This is generally propagated by cuttings, because the seeds seldom ripen well in *England*. If the cuttings are planted in a shady border any time in summer, and are duly supplied with water, they will soon put out roots; then they should be taken up carefully and planted in pots, for if they are permitted to remain in the border, they will soon grow so vigorous as to render their transplanting hazardous. When they are planted

planted into pots, they should be placed in the shade until they are rooted again; then they may be removed to enjoy the open air till *October*, when the frosts begin to be sharp; at which time they should be carried into the green-house, and treated in the same way as Myrtles, and other hardy green-house plants.

The common Sorrel is cultivated by seeds, and sometimes by parting of the roots; but the seedling plants, if they are allowed room, will have larger and more succulent leaves, than those which are propagated by slips. The plants should stand in rows about a foot asunder, to give room for digging the ground between them every spring: and if the plants are six inches distant in the rows, they may stand two or three years without removing, and only require to have the ground kept clean from weeds in summer, and slightly dug in the spring. The best time to part or transplant the roots is in autumn, which is also the best time for sowing of the seeds upon dry land.

The round-leaved, or *Roman Sorrel*, is propagated by its creeping roots. These may be transplanted either in spring or autumn, but the latter season is the best for dry ground. It thrives best on stony land, for it grows naturally on rocks. This seldom produces good seeds, especially when it is planted in light ground. The roots of this sort should be planted two feet asunder each way.

The seeds of the annual sorts should be sown the latter end of *March*, on a bed of common ground, in rows at a foot and half distance; and when the plants come up, they should be thinned so as to leave them four or five inches asunder; the ground must be kept clean from weeds, which is all the culture these plants require. In *July* they will flower, and their seeds will ripen in autumn.

ACETOSELLA. See Oxalis.

ACHILLÆA. Yarrow, Milfoil, or Nose bleed.

The Characters of this genus are,

The compound flowers have an oval scaly empalement, including many hermaphrodite florets in the disk, and from five to ten female half florets which compose the ray; the seeds are lodged in a chaffy bed, and have no down.

The Species which are kept in the *English* gardens,

1. ACHILLÆA foliis setaceis dentatis, denticulis subintegrifolulatis reflexis. *Lin. Sp. Pl.* Eastern Sneezwort, with a leaf like Lavender-Cotton, and a large flower.

2. ACHILLÆA foliis pinnatis hirsutis, pinnis linearibus dentatis, *Lin. Sp.* 897. Woolly Yarrow with yellow flowers.

3. ACHILLÆA foliis pinnatis supra decompositis laciniis linearibus distantibus. *Prod. Leyd.* 175. Tall Eastern Yarrow with leaves like Wormwood, and yellow flowers.

4. ACHILLÆA foliis pinnatifidis planis obtusis tomentosis. *Lin. Sp.* 898. Alpine umbelliferous Wormwood with silvery woolly leaves.

5. ACHILLÆA foliis lanceolatis obtusis acutè serratis. *Lin. Sp.* 898. Sweet Maudlin.

6. ACHILLÆA foliis pinnatis, foliolis obtusè lanceolatis serrato-dentatis. *Lin. Sp.* 898. Hoary Sneezwort with crested pinnule.

7. ACHILLÆA foliis lanceolatis acuminatis argutè serratis. *Lin. Sp.* 898. *Strore pleno.* Double Ptarmica, or Sneezwort.

8. ACHILLÆA foliis lanceolatis dentato-serratis, denticulatis minutè serratis. *Lin. Sp.* 898. Alpine white Maudlin with deep green leaves.

The common Yarrow, and some other species of this genus are here omitted, as they are rarely permitted to have a place in gardens. The common sort with white and purple flowers grow naturally in *England*, but the white is the most common, and is the sort which has been long used in medicine. It grows on the side of foot-ways almost every where, so may be easily procured.

The first sort here mentioned, has large yellow flowers

which stand upon pretty long footstalks singly, not in close bunches, as the common sort. It has leaves like those of Lavendar Cotton, which, when rubbed, emit a strong oily odour. This flowers in *June* and *July*.

The second sort hath woolly leaves shaped like those of the common sort, the flowers are yellow, growing in clusters at the top of the stalks, which seldom rise more than a foot high.

The third sort grows to the height of two feet and a half, having large umbels of yellow flowers on the top; the leaves are somewhat like those of the common Wormwood, and are cut into long narrow segments. This flowers in *June* and *July*.

The fourth sort is a native of the *Alps*; it is a plant of humble growth, the stalks seldom rising higher than six or seven inches; these support umbels of white flowers like those of the common Sneezwort, which appear in *April* and *May*. The leaves are silvery, and shaped like those of Wormwood, which frequently decay in the autumn or winter.

The fifth sort was used in medicine, and was some years past much cultivated in the gardens, as it was frequently used in the kitchens: but of late years it has been almost totally neglected, so was almost lost in *England* a few years since; and the markets were supplied with the eighth sort, which ignorant persons substituted in its stead, though the two plants are very different in appearance, and have very different flavours, and probably different qualities.

The sixth sort grows naturally in the *Archipelago*, but is hardy enough to live abroad in *England*, provided it is planted in a dry soil and a warm situation. It is a low plant, which puts out many heads near the roots, which are fully grnished with fine cut silvery leaves. The stalks rise from nine inches to a foot high, and are terminated by compact umbels of yellow flowers. This sort continues flowering great part of summer, so deserves a place in gardens.

The seventh sort is the common Sneezwort, of which there is a variety with double flowers, that is cultivated in gardens. The common sort, which is used in medicine, grows naturally in woods, and upon commons, in most counties in *England*. It creeps greatly at root, so that variety with double flowers should be confined, otherwise it will spread to a great distance, and will not be handsome.

The eighth sort grows naturally on the *Alps*, but is now commonly cultivated by those gardeners who supply the markets with physic herbs, and is sold for Sweet Maudlin, as is before-mentioned. This plant will rise four feet high in good land; the leaves are long, narrow, and sharply sawed on their edges; they are of a dark green, and the flowers are white: the roots creep far under ground, so they should be confined.

All the sorts of Yarrow are easily propagated by seeds, which may be sown either in the spring or autumn, upon a bed of common earth; and when the plants come up and are strong enough to transplant, they should be planted into beds in the nursery, where they may remain till autumn, at which time they should be transplanted to the places where they are designed to remain: if they are planted in a stony dry soil, they will live much longer than in rich ground.

The sorts with creeping roots propagate themselves so fast, as to render it necessary to confine them, otherwise they will spread wide on every side; and the stalks being separated to a distance from each other, the plants will make but an indifferent figure when the flowers are fully blown. The other sorts whose roots do not creep may be propagated by slipping off their heads, and planting them in a shady border; or if in an open bed, they must be shaded with mats in the day until they have taken root, after which

which they will require no farther care than to keep them clean from weeds till autumn, when they should be transplanted to the places where they are designed to remain.

ACHRAS. Mamme Sapota.

This is a large tree, which is propagated in the islands of the *West Indies*, but is supposed to have been transplanted thither from some other country. The leaves are nine or ten inches long, and five broad in the middle, drawing to points at both ends; they are smooth on their upper side, but have many slight veins running from the middle rib to the sides: the fruit is large, oval and fleshy, including one long oval-pointed nut, which is very smooth, having a longitudinal border on one side.

As I have not seen any of these trees in the *English* gardens, so I shall forbear to say any thing more of its culture, than that if the plants can be procured they must be kept in the bark-bed of the stove, and treated in the same way as other exotic plants of the same country. I have frequently received the stones of this fruit from *Jamaica*, but they were always rotten before they arrived, for not one of them ever sprouted; so that I believe, these seeds will not continue long sound after the fruit is eaten.

ACHYRANTHES. We have no proper *English* name for these plants. One of the sorts has been long in the gardens, and has been known by Father *Boccon's* title, *viz.* *Amaranthus ficulus spicatus radice perenne.* This sort grows naturally in both *Indies*, from whence I have several times received the seeds. There are three other species, whose seeds have been brought from the *Cape of Good Hope*, and the plants are preserved in curious botanic gardens, but being neither useful or beautiful, are seldom kept in other gardens, therefore they are not enumerated here.

ACINOS. See *Thymus*.

ACONITUM. Wolfsbane, or Monkshood.

The Characters are,

The flower has no empalement; it has five unequal petals, the upper is hooded and inverted; it has two forked nectariums, whose footstalks are recurved, and many small stamina which incline to the petals, with five styles terminated by reflexed stigmas. The flowers are succeeded by three or four capsules with one valve, containing many angular seeds.

The Species are,

1. ACONITUM foliis palmatis multifidis villosis. *Lin. Sp. Pl.* 532. Yellow Wolfsbane or Monkshood with hand-shaped leaves.

2. ACONITUM foliis palmatis nervosis glabris. Yellow Wolfsbane with larger smooth-veined hand-shaped leaves.

3. ACONITUM foliis multifidis, laciniis semipartitis supernè latis. *Hort. Cliff.* 24. Small Blue Wolfsbane or Monkshood with many pointed leaves.

4. ACONITUM foliorum laciniis linearibus supernè latioribus linea exaratis. *Hort. Cliff.* 214. Large Blue Wolfsbane or Monkshood, whose under leaves are cut into many narrow segments, and the upper into broader.

5. ACONITUM foliis palmatis multipartitis, spicis florum longissimis. The Common Monkshood or Blue Wolfsbane, with the longest spikes of flowers.

6. ACONITUM foliis multipartitis, laciniis linearibus incurvatis squarrosis. *Hort. Upsal.* 152. Yellow Wolfsbane of the *Pyrenees*, with leaves cut into many narrow segments which are rough.

7. ACONITUM floribus pentagynis. *Lin. Sp. Pl.* 532. Yellow wholesome Wolfsbane or Monkshood.

These sorts of Wolfsbane grow naturally upon the *Alps*, the mountains in *Germany*, *Austria*, and in *Tartary*, so require a cool shady situation, and a soil rather moist than dry; but not so wet, as to have the water standing near their roots in winter: in dry ground these plants do not thrive or flower well, especially if they are exposed much

to the sun. They may be all of them propagated by sowing their seeds in autumn, upon a north-border, where they are screened from the sun. The plants will come up the following spring, when they must be kept clean from weeds during the summer months, and in very dry seasons, if they are frequently refreshed with water, it will greatly promote their growth; the following autumn they should be transplanted into shady borders, into rows a foot asunder, and the plants at six inches distance in the rows. In this situation they may remain two years, by which time they will be strong enough to flower, so may be transplanted to the garden where they are designed to remain.

As these plants rarely flower in less time than three years from seeds, so they are generally propagated by parting of their roots; for when they are planted in a shady cool situation, the roots increase plentifully, especially the fifth sort; which, if not confined, will in a few years spread at a great distance. The autumn is the season for transplanting and parting of their roots, and if they are planted in a loamy soil to a north or east aspect, they will thrive greatly.

The roots of these plants are thick and fleshy, and in some sorts are as large as a man's thumb; these put out a great number of fibres every year, which spread to a considerable distance every way: therefore they should be allowed room, for if they have not two or three feet space, they will not produce strong flower stalks, in which their beauty chiefly consists. But the fifth sort must have much more room, because it sends out offsets in great plenty to a considerable distance every way. This has been the most commonly cultivated in the *English* gardens of all the species; and the flowers are annually brought in great plenty in *May* to the markets for flower-pots to adorn rooms; but as it is of a very poisonous quality, so it should be with great caution admitted where children frequent; there having been many instances of its dangerous effects.

Most if not all the species of this genus are hurtful in a greater or less degree, therefore should not be planted in those parts of gardens, where children are permitted to walk, lest by gathering of the leaves or flowers, and putting them in their mouths, or by rubbing either about their eyes, they should suffer by it. For the juice of the leaves will occasion great disorder, if only rubbed upon very tender flesh, but if taken inwardly will kill, unless there is timely relief. The farina of the flowers, if accidentally blown into the eyes, will occasion great pain and blindness for a time, by causing them to swell greatly, as I have myself experienced.

The Common Monkshood flowers in *May*, and is succeeded by the first and second sorts. The wholesome Wolfsbane comes after these, and the other sorts flower in *August* and *September*.

ACONITUM HYEMALE, or Winter Aconite. See *Helleborus*.

ACORUS. The Sweet Rush.

This plant grows naturally in deep standing waters, so is rarely admitted into gardens, for it will not thrive on dry land; but as the roots are used in medicine, so I would not omit the mention of it. Whoever has an inclination to propagate it, should procure some roots from the places where it grows naturally, and plant them in ditches, or close on the side of ponds, where they will thrive and increase greatly, if they are not disturbed.

ACRIVIOLA. See *Tropæolum*.

ACTÆA. Herb Christopher.

The Characters of the genus are,

The empalement of the flower is composed of four roundish concave leaves which fall off. The former has four petals which

drop off, and a great number of stamina; an oval germen with one stigma, which becomes a smooth oval berry including several roundish seeds.

The Species are,

1. *ACTÆA racemo ovato, fructibus baccatis.* Lin. Sp. 504. Common Herb Christopher.

2. *ACTÆA racemis longissimis, fructibus unicapsularibus.* Lin. Sp. 504. American Herb Christopher with the longest spikes of flowers, called Black Snakeroot in America.

3. *ACTÆA racemis paniculatis, fructibus quadricapsularibus.* Lin. Sp. 504. Herb Christopher with flowers disposed in panicles, and four capsules to each fruit.

The first sort grows naturally in shady woods, in some of the northern counties in England, particularly near Ingleborough hill in Yorkshire. It is by some curious persons preserved in gardens, for the sake of variety, but there is little beauty in the flowers to recommend it. This must have a shady situation and a moist soil, otherwise it will not thrive. It is propagated by seeds or parting of the roots; if by seeds, they should be sown in the autumn soon after they are ripe, on a shady moist border; for if the seeds are kept out of the ground till spring, they often fail, or at least lie a year before they vegetate. The time for parting and transplanting of the roots is in autumn; they require no other culture, but to keep them clear from weeds. It flowers in May, and the berries ripen in September.

The second sort is a native of North America, from whence the seeds have been brought to Europe. The fruit of this plant is frequently used in America, as an antidote to poison, and to cure the bite of venomous serpents. By some persons it is used as an emetic, and is sometimes called Ipecacuana.

The roots of this sort grow large, and multiply into several heads; and when they are planted in gardens, they should be allowed three feet every way to spread, for their leaves, which are composed of many branches, will soon cover so much room. The seeds of this plant do not ripen in England, so this is propagated by parting of the roots; the best time for transplanting and parting them is in the autumn, when the leaves begin to decay. It loves a loamy soil, not too dry. If the seeds are brought over, they should be sown as soon as they arrive, in a border of loamy earth. The seeds lie a year before they grow; the seedling plants should be transplanted in the autumn.

The stalks of this sort rise five or six feet high in moist land, and sustain very long spikes of white flowers in July and August. The plants should not be often removed, for that will prevent their flowering strong.

The third sort grows naturally in Siberia, and is at present rare in England. The leaves of this sort resemble those of the Feathered Columbine; the stalks rise little more than a foot high, supporting panicles of white flowers, which appear in May. This requires a moist loamy soil and shady situation, and may be propagated as the former.

ADANSONIA. The Sour Gourd; in French, *Pain du Singe*. Monkeys Bread.

The Characters are,

The empalement of the flower is cup-shaped, and cut into five parts at the top which turn backward. The flower has five roundish petals, fastened to the stamina at the base. It has a great number of stamina, which are joined and form a column at their base, but spread open above, and are crowned by prostrate summits. It has an oval germen, supporting a very long tubulous style which is variously intorted, crowned by several hairy stigmas spreading out in rays. The germen becomes a large oval woody capsule with many cells, filled with a mealy pulp, inclosing a great number of kidney-shaped seeds.

We know but one specie of this genus at present,

ADANSONIA. *Juss.* The Sour Gourd, or Monkeys Bread.

This tree was first described by *Prosper Alpinus*, in his book of *Egyptian plants*; but it is now known to grow in several other countries, particularly at *Senegal* in *Africa*, where there are many trees now growing, whose stems are of much greater bulk, than any other trees yet known. *Mr. Adanson*, who was four years in that country, to examine the natural productions of it, and is writing the natural history, measured the stems of several of these trees, which were from seventy-five to eighty feet in circumference; the greater branches of these trees, he says, are equal in size to the largest trees he had ever seen in *Europe*. He has not, in his account of these trees, mentioned any thing of the wood of them, or if it is used for any purposes there, but we may expect a more particular account of it, in that part of his natural history, where he is to treat of the vegetables of that country.

I have also lately received a fruit of this tree, which I was assured came from *Surinam* in the *West-Indies*, so it may probably be a native of that country. The fruit is almost as large as a man's head, the shell is woody and close, having a greenish downy coat; it is divided into ten, twelve, or fourteen cells within, which contain a good number of kidney-shaped seeds, as large as the tip of a man's little finger; these are closely surrounded with a mealy pulp of an acid taste.

The leaves of the young plants are entire, of an oblong form, about four or five inches long, and almost three broad towards the top, where they are broadest, having several veins running from the middle rib; they are of a lucid green, and stand alternately. As the plants advance in height, the leaves alter, and are divided into three parts; and afterwards into five lobes, which spread out in the shape of an hand. In some of the oldest plants, I have seen leaves with seven divisions, but these are rare in the plants which are in *England*.

The plants rise easily from fresh seeds, if they are sown in a hot bed, and are of quick growth for two or three years, but afterwards make but little progress; the lower part of their stems then begin to swell and grow much larger than the other part, after which they do not advance much in their upright growth, but put out lateral branches, which incline to an horizontal position; the branches are covered with light grey bark. The leaves fall off in the latter part of winter, and the young leaves do not come out till summer, so the branches are naked for near three months.

As this tree is a native of very hot countries, the plants will not thrive in the open air in *England*, in summer, therefore they must be constantly kept plunged in the bark-bed in the stove; and in warm weather, the fresh air should be admitted to them every day; but in winter they must be kept warm: while the plants are in a growing state, they must be frequently refreshed with water, but when they are destitute of leaves, it must be given sparingly, for too much wet will then rot their roots. It loves a light rich loamy soil.

ADENANTHERA. Bastard Flower-fence.

The Characters are,

The empalement of the flower has five indentures; the flower has five petals, ten erect stamina having prostrate summits whose points have globular glands, and an oblong germen supporting one style crowned by a single stigma; the flower is succeeded by an oblong compressed pod, inclosing four or five roundish compressed seeds.

We have but one specie of this genus in *England*, which is, *ADENANTHERA foliis utrinque glabris.* Lin. Syst. 1020. *Adenantha* with smooth leaves.

This is a native of *India*, from whence the seeds have been brought to *England*. It grows naturally in the plains near the sea in *Hiboca* and *Senalo*, where it rises to a considerable stature; it is as large as the *Tamarind* tree, spreads its branches wide on every hand, making a fine shade, so is frequently planted by the inhabitants in their gardens, and near habitations for that purpose. The leaves of this tree are doubly winged; the flowers are small and of a yellow colour, and are disposed in a long thyrse or bunch. These are succeeded by long twisted membranaceous-pods, inclosing several compressed hard seeds of a fine scarlet colour, which are lodged in the pods at a distance from each other. The inhabitants perforate these seeds, and string them for the young women, who wear them about their necks.

There is another species of this tree, which is figured and described by *Rumphius*, in his *History of the Amboyna* plants, whose leaves are woolly on their underside, but this is not in our *English* gardens at present.

The sort here described requires the same treatment as the *Poinciana*, and the tender kinds of *Acacia*; to which articles the reader is desired to turn, for the culture of it: as these agree in every part so well, as that whoever can manage one, need not fear the other thriving well with the same degree of heat and management, which renders it unnecessary to insert in this place, since it would swell the work too much.

ADIANTUM. Maidenhair.

This genus is placed in *Linnaeus's* twenty-fourth class, intitled *Cryptogamia*, where he has ranged the Ferns, Maiden-hairs, *Polypodium*, &c. with the Moss, Mushroom; and all those plants, which do not produce flowers conspicuous to the naked eye; being either concealed in their fructification, or so small as not to be perceived without the help of glasses. The first order of this class is of Ferns, &c. most of which have their flowers and seeds on the back of their leaves. There are a great number of species under this genus, which grow naturally in warm countries but we have only two in the *English* gardens, viz.

1. *ADIANTUM frondibus decompositis, foliis alternis, pinnis cuneiformibus lobatis pediculatis.* *Lin. Sp. Plant.* 1096. The officinal or true Maidenhair.

2. *ADIANTUM fronde pedata, foliolis pinnatis, pinnis anticè gibbis incisus fructificantibus.* *Lin. Sp. Plant.* 1095. *Canada* Maidenhair.

The first sort is the true Maidenhair, which is directed to be used in medicine; but as it does not grow naturally in *England*, so the *Trichomanes* is usually substituted for it, which is found growing wild in great plenty in several parts of *England*. The other is a native of the south of *France*, *Italy*, and the *Levant*, from whence I received the plants. It usually grows out of the joints of walls, and the fissures of rocks, so that whoever is inclinable to keep this plant in their gardens, should plant it in pots filled with gravel and lime rubbish, in which it will thrive much better than in good earth; but the pots must be sheltered under a frame in winter, otherwise the plants are often killed by the frost.

The second sort is often preserved in gardens for the sake of variety; this should be planted in pots, and treated in the same manner as the former, for although it will live through the winter in the open air in moderate seasons, yet in severe frost it is often destroyed. This sort grows naturally in *Canada* in such quantities, that the *French* send it from thence in package for other goods, and the apothecaries at *Paris* use it for the Maidenhair in all their compositions, in which that is ordered.

ADONIS, or FLOS ADONIS. Pheasant's Eye.

The Characters are,

The flower has a five-leaved empalement, and five or eight

petals without any nectarium. It has many stamina and pointals, and the seeds are naked. It is ranged in the seventh division of *Linnaeus's* thirteenth class.

The Species are,

1. *ADONIS floribus octopetalis fructibus subcylindricis.* *Hort. Upsal.* 156. The common Adonis, or Flos Adonis, with small red flowers, of late called Red Morocco.

2. *ADONIS floribus pentapetalis fructibus ovatis.* The annual Adonis with pale yellow flowers.

3. *ADONIS floribus polypetalis, fructibus obtusis, radice perenne.* Perennial Adonis with yellow flowers, by some titled fennel-leaved black Hellebore.

The two first sorts are annual, so perish when the seeds are ripe. If the seeds are sown in the autumn, soon after they are ripe, the plants will come up the following spring; but when the seeds are not sown till spring, they rarely come up the same year. So that when the seeds are permitted to fall on the ground, they generally succeed better than when sown by art. The first sort grows naturally in *Kent*, particularly by the sides of the river *Medway*, between *Rockester* and *Maidstone*, where it is found in great plenty in the fields which are sown with wheat, but in the intermediate fields which are sown with spring corn, there is rarely a plant of it to be found, which shews the necessity of sowing the seeds in autumn; for those fields of spring corn, if suffered to remain undisturbed after the harvest, will abound with this plant the following year. For some years past great quantities of the flowers of this plant have been brought to *London*, and sold in the streets by the name of Red Morocco.

These plants will thrive best in a light soil, but may be sown in any situation, so that by sowing some in a warm situation, and others in the shade, they may be continued longer in flower. The seeds ought to be sown where the plants are to remain to flower, for they do not bear transplanting well, unless it is done when the plants are young; and therefore they should be sown in small patches in the borders of the flower garden, and when the plants come up, they should be thinned, leaving but few in each patch, which will make a better appearance than where they grow single.

The third sort hath a perennial root, and an annual stalk. This grows naturally on the mountains of *Bohemia*, *Prussia*, and other parts of *Germany*, but has been long cultivated in gardens. It produces its flowers the latter end of *March*, or the beginning of *April*, according to the forwardness of the season; the stalks rise about a foot and an half high, and when the roots are large, and have stood unremoved for some years, they will put out a great number of stalks from each root; these are garnished with fine slender leaves, which are placed in clusters at intervals. At the top of each stalk, is produced one large yellow flower, composed of an unequal number of petals, the center of which is occupied by a great number of germen, surrounded by many stamina; after the flowers drop, the germen become naked seeds, closely adhering to the footstalk, forming an obtuse spike.

This sort is propagated by seeds, which must be sown in the autumn soon after they are ripe, on an east-border, where they may have only the sun in the forenoon: when the plants come up the following spring, they must be kept clean from weeds, and in very dry weather if they are watered, it will greatly promote their growth. The following autumn the plants should be carefully taken up, and planted in a nursery-bed, at four or five inches distance, where they may remain two years to acquire strength, then may be transplanted into the pleasure-garden, where they may remain for good, because these plants do not bear transplanting well when they are old.

ADOXA. Moschatellina. Tuberos Moschatel, or Hollow Root.

This plant grows naturally in shady woods in several parts of *England*, so is seldom kept in gardens; therefore all that is necessary to be inserted of its culture is, to plant it in a shady moist part of the garden, where it will thrive fast enough.

ÆSCHYNOMENA. The false Sensitive Plant.

The Characters are,

The flower is of the butterfly kind, having ten stamina in two bodies; the cup is divided into two lips; the pod is erect, compressed, and jointed.

The Species are,

1. ÆSCHYNOMENE caule scabro leguminum articulis medio scabris. *Lin. Sp. Plant.* 713. Bastard Sensitive Plant with a rough stalk, and a jointed pod.

2. ÆSCHYNOMENE caule hispido foliis acuminatis, leguminum articulis suborbiculatis. *Prod. Leyd.* 384. Bastard Sensitive Plant with a prickly stalk, pointed leaves, and jointed pods half-rounded.

3. ÆSCHYNOMENE caule lævi arboreo leguminum articulis semicordatis glabris. *Prod. Leyd.* 384. Bastard Sensitive Plant with a smooth tree-like stalk, and smooth jointed pods.

These plants are natives of warm countries; the seeds of the two first sorts I have received from *Africa*, and those of the third from *America*, and also from *China*, and several parts of *India*.

They are generally kept in botanic gardens, but are seldom preserved in any other, as there is little beauty in their flowers, and as they are plants of no use; beside, they require a good stove to preserve them in *England*. The first and third sorts may be preserved through the winter in a bark-bed in the stove; but as their leaves and stalks are succulent, so they should have but little water given to them in cold weather, for much wet at that season will cause them to rot. The second year the plants will flower, and sometimes will perfect their seeds in *England*.

The second sort will perfect its seeds the same year it is raised, if kept under a frame, or in an airy glass-case, so is generally treated here as an annual plant, though it may be preserved through the winter in a stove.

These plants are propagated by seeds, which should be sown on a hot-bed early in the spring, and when the plants have strength enough to be removed, they should be put each into a separate small pot, filled with light earth, and plunged into a fresh hot-bed, to bring them forward; and as they advance in their growth, they should be shifted into larger pots, but great care should be taken not to overpot them, for if the pots are too large, the plants will not thrive. They must be brought forward early in the year, otherwise the second sort will not perfect its seeds.

ÆSCULUS. *Lin. Gen.* 420. The Horse Chestnut.

The title which *Dr. Linnæus* has applied to the genus, might, with greater propriety, have been given to the Chestnut, which by that author is joined to the Beech-tree, making it only a species of that genus.

The Characters are,

The empalement of the flower is slightly cut into five segments; the flower is composed of five unequal petals, folded at their border, and waved; it has seven stamina, the empalement becomes a thick, roundish, echinated capsule, opening into three cells, in one or two of which are lodged globular seeds.

We have but one Species of this genus, viz.

ÆSCULUS floribus heptandriis. *Hort. Upsal.* 92. The Common Horse Chestnut.

The Horse Chestnut was brought from the northern parts of *Asia* about the year 1550, and was sent to *Vienna* about the year 1588. It was called *Castanea* from the shape of

its fruit, and the title of *Equini* was added to it from its being a good food for horses when ground.

This tree was in much greater esteem formerly than at present, for since it is become so very common, few persons regard it. What has occasioned its being so seldom planted, is the decay of the leaves early in summer, so that their leaves frequently begin to fall in *July*, and occasion a litter from that time, until all the leaves are fallen; but notwithstanding this inconvenience, the tree has great merit, for it affords a noble Shade in summer; and during the month of *May*, there is no tree has greater beauty, for the extremity of the branches are terminated by fine spikes of flowers, so that every part of the tree seems covered with them; which are finely spotted with a rose colour, and these being intermixed with the green leaves make a noble appearance.

As this tree is quick in its growth, so in a few years it will arrive to a size large enough to afford a good shade in summer, as also to produce plenty of flowers. I have known trees which were raised from nuts, in twelve or fourteen years, large enough to shade two or three chairs under the spread of their branches, and have been covered with flowers in the season, so that few trees make greater progress than these. But as their wood is of little value, so the trees should not be propagated in too great plenty: a few therefore of them placed at proper distances in parks for ornament, is as many as should be preserved, the wood not being fit even for burning, nor any other use that I know of.

These trees are propagated by sowing of the nuts, the best time for doing this is early in the spring; but the nuts should be preserved in sand during the winter, otherwise they are apt to grow mouldy and rot. They may indeed be planted in autumn, but then they will be in danger of rotting if the winter should prove very wet.

When the nuts succeed, and have a proper soil, the plants will shoot near a foot the first summer; so that where they grow pretty close together, it will be proper to transplant them the following autumn, when they ought to be planted in rows at three or four feet distance, and one foot and an half asunder in the rows: in this nursery they may remain two years, by which time they will be fit to plant where they are designed to be continued; for the younger these trees are planted out, the larger they will grow. But there are many who will object to their being planted out young in parks, because they will require a fence to secure them against the cattle; which will also be necessary, whatever size they are when planted; and if large, they must be well staked to prevent their being displaced by strong winds: which is another expence, so that when we consider how much faster a young tree will grow, than those which are removed at a greater age, there can be no excuse for planting large trees.

When these trees are transplanted, their roots should be preserved as entire as possible, for they do not succeed well, when torn or cut; nor should any of the branches be shortened, for there is scarce any tree, which will not bear amputation better than this; so that when any branches are by accident broken, they should be cut off close to the stem, that the wound may heal over.

There is something very singular in the growth of these trees, which is, the whole shoot being performed in less than three weeks, after the buds are opened; in which time I have measured shoots a foot and an half long, with their leaves fully expanded.

In *Turkey* the nuts of this tree are ground, and mixed with the provender for their horses, especially those which are troubled with coughs, or are broken winded; in both which disorders, they are accounted very good. Deer are very fond of the fruit, and at the time of their ripening will

will keep much about the trees, but especially in strong winds, when the nuts are blown down, which they carefully watch, and greedily devour as they fall.

There are in some gardens a few old trees now standing, which were planted single, at a great distance from any other; these are grown to a very large size, and their heads form a natural parabola, and when their flowers are in full beauty, there is not any tree yet known in *Europe*, which makes so fine an appearance. I have measured some of these trees, whose branches have extended more than thirty feet in diameter, and their heads have been so close, as to afford a perfect shade in the hottest seasons. These were planted in 1679, as appears by some writings which are in the possession of the persons, who have now the property of the land where they grow: so that although they are of quick growth, yet they are not of very short duration.

AGAVE. *Lin. Gen.* 390. Common *American Aloe*.

The *Characters* are,

The flower has no empalement, it is erect and spreads open at the brim. It has six erect stamina, crowned by narrow summits; after the flower is past, the germen becomes an oblong three-cornered seed-vessel, having three cells, which are filled with flat seeds.

Dr. *Linnaeus* has separated the plants of this genus from the *Aloe*, to which they had been joined by former botanists, because the stamina and style in these flowers, are extended much longer than the corolla, and the corolla rest upon the germen, which in the *Aloe* are not so. We may also mention another difference in the growth of the plants, by which they may be distinguished before they flower; which is, all the plants of this genus have their center leaves closely folding over each other, and embracing the flower-stem which is formed in the center; so that these never flower until all the leaves are expanded, to give the stem its liberty to advance, and when the flower is past, the plants die.

The *Species* are,

1. AGAVE *foliis dentato-spinosis scapo ramofo. Gen. Nov.* 1102. The common Great *American Aloe*, with a branching stalk.

2. AGAVE *foliis dentato-spinosis scapo simplicissimo. Lin. Sp. Plant.* 323. Great *American Aloe* with a simple stalk.

3. AGAVE *foliis integerrimis. Gen. Nov. Lin. Sp. Pl.* 323. *American Aloe* with stiff whole leaves called *Piet*.

4. AGAVE *radice tuberosâ foliis longissimis marginibus spinosis.* Smaller *American Aloe*, with a tuberos root and very long leaves, with spines on their edges.

5. AGAVE *foliis lanceolatis reflexis, marginibus dentatis.* *American Aloe* with spear-shaped reflexed leaves, whose edges are indented, called *Sobolifera*.

6. AGAVE *foliis longis erectis latè virentibus, marginibus fuscis minimè ferratis.* *American Aloe* with long deep green leaves, edged with brown, and very slightly sawed. This is called in *America* *Karattò*.

7. AGAVE *foliis oblongis marginibus spinosissimis nigricantibus.* *American Aloe* with oblong leaves, whose edges are closely beset with black spines, commonly called broad-leaved *Aloe* from *Vera Cruz*.

8. AGAVE *foliis lineari-lanceolatis integerrimis rigidis aculeo terminatis.* Narrow leaved *Aloe* from *Vera Cruz*.

The first sort here mentioned, has been long preserved in the *English* gardens, where of late years there hath been several of the plants in flower. The stems of this when the plants are vigorous, generally rise upward of twenty feet high, and branch out on every side toward the top, so as to form a kind of pyramid: the slender shoots being garnished with greenish yellow flowers, which stand erect, and come out in thick clusters at every joint.

When these plants flower, they make a fine appearance, and continue a long time in beauty, if they are protected from the cold in autumn, as there will be a succession of new flowers produced, for near three months, in favourable seasons. It has been generally believed, that this plant doth not flower until it is an hundred years old; but this is a great mistake, for the time of its flowering depends on the growth of the plants; so that in hot countries where they grow fast, and expand many leaves every season, they will flower in a few years; but in colder climates, where their growth is slow, it will be much longer before they shoot up their stem. There is a variety of this sort with striped leaves, which is now pretty common in the *English* gardens.

The plants of the second sort are so like those of the first, as not to be distinguished from them, but by good judges. The principal difference is, the leaves of this are narrower toward their extremity, and of a paler colour: the stems of this sort do not rise so high as the first, nor do they branch in the same manner, but the flowers are collected into a close head at the top; they are however of the same shape and colour. There has been three or four plants of this sort, which have lately flowered in *England*; one of which was in the *Chelsea* garden a few years past. This sort seldom puts out so many offsets as the common *Aloe*.

The seventh sort greatly resembles these, so that many persons have supposed it to be the same. But the leaves of this are much thinner, the indentures on their edges abundantly closer, and not so deep, as in either of the former; the spines too are blacker. How this differs from others in flower I know not, as none of their flowers have been produced in *England*, so far as I know.

These three sorts are hardy. I have known plants of the first sort live in the open air for some years in mild seasons, but in severe winters they are always killed, if not sheltered in that season. They are propagated by offsets, which the first sort sends out in plenty, but the third seldom puts out any; so these may be increased by taking off some of the larger roots, at the time when the plants are shifted; planting them in pots filled with light sandy earth, they will shoot out and become good plants, as I have often experienced. These should be planted in pots filled with light sandy earth, and housed in winter with *Oranges*, *Myrtles*, &c. and during that season, should have but little wet. In the summer they must be placed abroad in the open air, where they may remain till toward the end of *October*, when they should be housed again. The seventh sort being a little tenderer than the other two, should be put into the green-house before them, and may stay there a little longer in the spring.

The third sort hath long narrow stiff leaves, of a pale green colour, not indented on their edges, but frequently a little waved; the side leaves spread open, but those in the center fold closely over each other, and strictly surround the bud. The plants of this sort rarely grow more than three feet high, but the flower stem rises near twenty, and branches out much like that of the first, but more horizontally; the flowers are of the same shape, but smaller, and of a greener colour: after the flowers are past, instead of seed-vessels, young plants succeed to every flower, so that all the branches are closely beset with them. This sort never produces offsets from the root, so that it cannot be increased but when it flowers, at which time there will be plenty enough; the old plant presently after dies.

The fourth sort hath leaves somewhat like the third in shape and colour, but they are indented on the edges, and each indenture terminates in a strong thorn; the root of this sort is thick, and swells just above the surface of the ground;

ground; in other respects it agrees with the former. Dr. *Linneus* supposes this sort to be the same with the third species, but whoever sees the plants, will not doubt of their being different.

The fifth sort never grows to a large size, the leaves of it are seldom more than a foot and an half long, and about two inches and an half broad at their base; these end in a slender spine, being slightly indented on their edges; they are also reflexed backward toward their extremity, and are of a dark green colour. The flower-stem rises about twelve feet high, and branches out toward the top in the same manner as the third sort; the flowers are nearly of the same size and colour as those of the third, and after they fall off, are succeeded by young plants in the same manner.

The leaves of the sixth sort, are from two feet and an half to three feet long, and about three inches broad, being of a dark green colour ending in a black spine; the borders of the leaves are of a brownish red colour, and slightly serrated. These stand more erect than in the other species; but as this sort hath not flowered in *England*, so I cannot say how it differs from the other. The plants of it were sent me from *St. Christophers* by the title of Korato, which I suppose is given indifferently to other species of this genus; for I have frequently heard the inhabitants of *America* call the common great Aloe by the same name.

The eighth sort hath long narrow stiff leaves, which are entire, and are terminated by a stiff black spine. These leaves are seldom more than two feet long, and little more than an inch broad, being of a glaucous colour: the side leaves stand almost horizontally, but the center leaves are folded over each other, and inclose the flower-bud. This sort never puts out suckers from the root, nor have I seen any plants of this kind in flower, although there are many of them in the *English* gardens, some of which are of a considerable age.

The third, fourth, fifth, sixth, and eighth sorts, are much tenderer than the others, so cannot be preserved through the winter in *England*, unless they are placed in a warm stove; nor will they thrive if set abroad in summer, therefore they should constantly remain in the stove, observing to let them enjoy a great share of free air in warm weather. They require a light sandy earth, and should have little wet in winter; but in warm weather, may be gently watered twice a week, which is as often as is necessary; for if they have much water given them, it rots their roots, and then their leaves will decay and insects infest them. They should be shifted every summer into fresh earth, but must not be put into large pots, for unless their roots are confined, the plants will not thrive.

AGERATUM. *Lin. Gen. Plant.* 842. Bastard Hemp Agrimony.

The Characters are,

The flower has a naked receptacle, it has five bristly hairs, an oblong cup almost equal, and the style is scarce any longer.

The Species are,

1. AGERATUM foliis ovatis caule piloso. *Lin. Sp. Plant.* 839. Bastard Hemp Agrimony, with oval leaves and a hairy stalk.
2. AGERATUM foliis oppositis petiolatis crenatis, caule bifido. Bastard Hemp Agrimony, with leaves having long foot-stalks placed opposite, whose edges are bluntly indented, and a hairy stalk.
3. AGERATUM foliis ovato cordatis rugosis feralibus alternis, caule glabro. *Lin. Sp. Plant.* 839. Bastard Hemp Agrimony, with rough oval heart-shaped leaves, flower branches growing alternate, and a smooth stalk.

The two first are annual plants; the seeds of these must be sown on an hot-bed in the spring, and when the plants are come up and are strong enough to remove, they should

be transplanted into another moderate hot-bed, observing to water and shade them until they have taken root; after which time, they must have a good share of air in warm weather, otherwise they will grow up very weak. In summer, the plants will thrive in the open air. The seeds ripen in *September* and *October*, and when any of them scatter upon the ground, and the same earth happens to be put on an hot-bed the following spring, the plants will come up in great plenty, as they frequently do also in the open air. The first sort grows naturally in *Africa*, and also in the islands of *America*; for in tubs of earth which I received with plants from *Jamaica*, *Barbadoes*, and *Antigua*, I have had plenty of plants arise, from seeds which were scattered on the ground. The second sort was found growing naturally at *La Vera Cruz*, by the late Dr. *William Houslow*, who sent the seeds to *Europe*, which have so well succeeded in many gardens, as to become a weed in the hot-beds.

The third sort grows naturally in *Carolina*, but has been many years an inhabitant of the *English* gardens. This hath a perennial root, and an annual stalk, which dies in winter, but the roots put out fresh stalks in spring.

This sort is propagated by seeds, as also by parting of the roots; the latter method is commonly practised in *England*, because there are few autumns so favourable as to ripen the seeds: but the seeds are frequently brought from *North America*, where this plant is very common; for being light, they are easily waisted about to a great distance, where they come to maturity; so that where there are any plants growing, all the adjoining land is filled with the seeds of them.

The best time for paring and transplanting the roots of this plant, is in autumn, soon after their stalks decay, that they may have good root before the drying winds in spring come on, otherwise they will not flower strong, or make a good increase. The roots should be allowed three feet room every way, for as they spread and increase very much at root, so when they are cramped for room, the plants starve, and in dry seasons their leaves will hang as if they were dead.

AGERATUM, or MAUDLIN. See Achillea.

AGERATUM PURPUREUM. See Erinus.

AGNUS CASTUS. See Vitex.

AGRIFOLIUM. See Ilex.

AGRIMONIA. *Lin. Gen. Plant.* 534. Agrimony.

The Characters are,

The empalement of the flower is indented in five parts; the flower has four or five petals, which are inserted in the empalement. In the center arises a simple style resting on the germen; it has twelve slender stamina. The empalement has two cells which are compressed on both sides, and radiated length-wise.

The Species are,

1. AGRIMONIA foliis caulinis pinnatis, foliolis undique serratis omnibus minutis interstinctis fructibus hispids. *Lin.* The common Agrimony.
2. AGRIMONIA foliis pinnatis, foliolis obtusis dentatis. The white Agrimony.
3. AGRIMONIA altissima, foliis pinnatis foliolis oblongis acutis serratis. The sweet scented Agrimony.
4. AGRIMONIA foliis caulinis pinnatis, stipulis caulem obtangentibus, spica subrotunda sessili, fructibus hispids. *Lin.* Eastern Agrimony.
5. AGRIMONIA foliis caulinis ternatis fructibus glabris. *Hort. Cliff.* 179. Three-leaved Agrimony with smooth fruit.

The first sort grows naturally in several parts of *England*, by the sides of hedges, and in woods. This is the sort which is commonly used in medicine, and is brought to the markets by those who gather herbs in the fields.

The second sort is the smallest of all the species; the leaves of this have not so many pinnæ as the common sort, and the pinnæ are rounder, and the indentures on their edges blunter. The spike of flowers is slender, and the flowers smaller and of a dirty white colour. This sort grows naturally in *Italy* from whence I received the seeds, and have constantly found that the seeds of this when sown never vary.

The third sort grows near four feet high, the leaves of this have more pinnæ than either of the other, and they are longer and narrower, ending in acute points; the serratures of the leaves are sharper than any of the other, and when handled emit an agreeable odour.

The fourth sort is of humble growth, seldom rising above two feet high; the pinnæ of its leaves are longer and narrower than either of the former, and the spikes of flowers very short and thick. The roots of this are very thick, and spread widely under ground, by which it multiplies faster than either of the other.

The fifth sort greatly resembles the other in the shape of its pinnæ (or smaller leaves) but there are but three upon each foot stalk; the flower of this hath a double empalement, the outer one being fringed. *Fabius Columna*, and other writers on botany, have separated it from the Agrimony, making it a distinct genus.

All these sorts are hardy perennial plants, which will thrive in almost any soil or situation, and require no other care but to keep them clean from weeds. They may be propagated by parting their roots, which should be done in autumn, when their leaves begin to decay, that the plants may be well established before the spring. They should not be planted nearer than two feet, that their roots may have room to spread. They may also be propagated by seeds, which should be sown in autumn, for if they are kept out of the ground till spring, they seldom come up the same season.

AGROSTEMMA. *Lin. Gen. Plant.* 516. Wild Lychnis or Campion.

The Characters are,

The flower has a thick empalement of one leaf, it has five petals which are obtuse and entire, and the capsule has one cell.

The Species are,

1. AGROSTEMMA *hirsuta calycibus corollam æquantibus petalis integris nudis. Lin. Sp. Pl.* 435. Hairy wild Lychnis, commonly called Corn Campion or Darnel.

2. AGROSTEMMA *tomentosa foliis ovato-lanceolatis, petalis integris coronatis. Hort. Upsal.* 115. The single Rose Campion.

3. AGROSTEMMA *tomentosa petalis emarginatis. Lin. Sp. Pl.* 436. The umbelliferous Mountain Campion.

The first sort grows naturally in the corn fields in most parts of *England*, so is seldom admitted into gardens.

The single Rose Campion has been long an inhabitant of the *English* gardens, where, by its seeds having scattered, it is become a kind of weed. There are three varieties of this plant, one with deep red, another with flesh coloured, and a third with white flowers, but these are of small esteem; for the double Rose Campion being a finer flower, has turned the others out of most fine gardens. The single sorts propagate fast enough by the seeds, where they are permitted to scatter, for the plants come up better from self-sown seeds, than when they are sown by hand, especially if they are not sown in autumn.

The sort with double flowers never produces any seeds, so is only propagated by parting of the roots; the best time for this is in autumn, after their flowers are past; in doing of this, every head which can be slipped off with roots should be parted; these should be planted in a border of fresh undunged earth, at the distance of six inches, ob-

erving to water them gently until they have taken root, after which they will require no more, for much wet is very injurious to them, as is also dung. After the heads are well rooted, they should be planted into the borders of the flower-garden, where they will be very ornamental during the time of their flowering, which is in *July* and *August*. This is a variety of the single sort, which was first accidentally obtained from seeds.

The fifth sort grows naturally upon the *Helvetican* mountains. This is a low plant, with woolly leaves, the flower-stem rises near a foot and an half high; the flowers grow in umbels on the top of the stalk, which are of a bright red colour. This flowers in *June*, and the seeds ripen in *August* or *September*; it should have a shady situation, and will thrive best in a strong soil.

AIZOON.

This name has been by some writers applied to the House Leek, and also the Aloes.

The Characters are,

It hath a permanent empalement of one leaf, which is cut into five acute segments, with a five-cornered germen empalement, supporting five styles which are crowned, and a simple stigma. The germen afterward becomes a swelling five-cornered capsule, having five cells, in which are lodged many roundish seeds.

This genus of plants is by *Dr. Linnæus* ranged in the fifth division of his twelfth class, entitled *Icosandria pentagynia*.

The Species are,

1. AIZOON *foliis cuneiformi-ovatis floribus sessilibus. Hort. Upsal.* 127. Sempervive or Ficoidea with oval wedge-shaped leaves, and flowers without foot-stalks.

2. AIZOON *foliis lanceolatis floribus sessilibus. Lin. Sp. Pl.* 488. Sempervive with spear-shaped leaves and flowers, having no foot-stalks.

3. AIZOON *foliis lanceolatis floribus paniculatis. Lin. Sp. Pl.* 448. Sempervive with spear-shaped leaves and flowers growing in panicles.

As we have no *English* names for these plants, so I have adopted this of Sempervive, which hath been applied to the Aloe and Sedum, both which have been also titled Aizoon and Sempervivum.

The first sort is a native of the *Canary Islands*: This is an annual plant, which must be raised on a moderate hot-bed in the spring; and when the plants are fit to transplant, they should be carefully taken up, and planted each into a small pot filled with fresh light earth, and plunged into another moderate hot-bed to bring them forward; but as the weather grows warm they must be hardened by degrees to bear the open air, into which they should be removed in *June*, placing them in a sheltered situation, where they will flower, and ripen their seeds in *September*, soon after which the plants will perish.

The second sort grows naturally in *Spain*; this is also an annual plant, whose branches trail on the ground; the flowers have no beauty, so these plants are only preserved by those who are curious in collecting rare plants for the sake of variety.

The third sort grows naturally at the *Cape of Good Hope*, from whence the seeds were brought to *Europe*. This is also of humble growth, and perishes soon after the seeds are ripe.

These may be propagated in the same manner as the first, and when the plants have acquired strength, they may be planted in the full ground; but they require a poor sandy soil, for in rich ground they will grow very luxuriant in branches, but will not flower till late in the season, so rarely perfect their seeds; but when they are planted in dry sand, or lime rubbish, they will be more productive of flowers, and less vigorous in the branches.

ALATERNOIDES;

ALATERNOIDES. See *Phyllica*, *Clutia*, and *Ceanothus*.

ALATERNUS. Ever-green Privet.

The *Characters* are,

It hath male and female flowers in different plants. The male flowers have an empalement of one leaf, cut into five segments at the brim; five small petals; at the base of these petals are fastened so many stamina. The female flowers have a great resemblance to the male, but have no stamina; in the center is placed the germen, supporting a trifid style crowned by a round stigma; the germen afterward becomes a soft round berry, containing three seeds.

The *Species* are,

1. *ALATERNUS foliis ovatis marginibus crenatis glabris.* The common Alaternus.

2. *ALATERNUS foliis subcordatis serratis glabris.* Alaternus with small heart-shaped leaves.

3. *ALATERNUS foliis lanceolatis profundè serratis glabris.* Cut-leaved Alaternus.

4. *ALATERNUS foliis ovato-lanceolatis integerrimis glabris.* Broad-leaved Alaternus.

The varieties of these plants are, the first sort with variegated leaves, which is commonly called Bloatched Phillyrea by the nursery-gardeners. And the third sort with leaves striped with white, and another with yellow; these are known by the silver and gold striped Alaternus: but as these are accidental varieties, so I have omitted placing them among the number of species.

The common distinction of this genus from the Phillyrea, is in the position of their leaves, which in the plants of this are placed alternately on the branches, whereas those of Phillyrea are placed by pairs opposite; this is obvious at all seasons, but there are more essential differences in their characters, as will be explained under the article Phillyrea.

The first sort has been long cultivated in the *English* gardens, but the plain sort is now uncommon here; for the bloatched-leaved sort has been generally cultivated in the nurseries, and the other has been almost totally neglected.

The second sort was formerly in the *English* gardens, in much greater plenty than at present. This was generally called Cellastrus, or Staff-tree; the leaves of this sort are placed at greater distances than those of the first; so that their branches appear thinly covered with them, which may have occasioned their being disesteemed.

The third sort has been an old inhabitant in some gardens, but was not much propagated till of late years; the leaves of this are much longer and narrower than those of either of the other sorts, and the serratures on their edges are much deeper.

These sorts are by some supposed to be only varieties and not distinct species; but from many repeated trials, in raising them from seeds, I can affirm they do not vary, the seeds constantly producing the same species as they were taken from.

All these sorts are easily propagated by laying their branches down, as is practised for many other trees. The best time for this is in autumn, and if properly performed, the layers will have made good roots by the autumn following, when they may be cut off from the old stock, and planted either into the nursery, or in the places where they are designed to remain. When they are planted in a nursery, they should not remain there longer than two or three years; for they shoot their roots to a great distance on every side, so they do not remove with safety after several years growth. They may be transplanted either in the autumn or the spring, but in dry land the autumn planting is best, whereas in moist ground the spring is to be preferred.

The plain sorts may also be propagated by sowing their berries, which they produce in great plenty, but the birds are greedy devourers of them; so that unless the berries are guarded from them, they will soon be gone when they begin to ripen. The plants which arise from seeds, always grow more erect than those which are propagated by layers, so are fitter for large plantations, as they may be trained up to stems, and formed more like trees; whereas the layers are apt to extend their lower branches, which retards their upright growth, and renders them more like shrubs. They will grow to the height of eighteen or twenty feet, if their upright shoots are encouraged; but to keep their heads from being broken by wind or snow, those branches which shoot irregular should be shortened, which will cause their heads to be closer, and not in so much danger.

ALCEA. *Lin. Gen.* 750. The Hollyhock.

The *Characters* are,

The flower hath a double empalement, of which one is permanent, and cut into six parts. The inner is larger and slightly cut into five. In the center is placed the round germen, supporting a short cylindrical style, with many stamina joined below to the pentagonal column, and spread open at top; the germen afterwards becomes a round, depressed, articulated capsule, having many cells, in each of which is lodged one compressed kidney-shaped seed.

The *Species* are,

1. *ALCEA foliis sinuatis angulosis.* *Hort. Cliff.* 348. Hollyhock with angular sinuated leaves.

2. *ALCEA foliis palmatis.* *Hort. Cliff.* 348. Hollyhock with handed leaves.

These are distinct species, whose difference in the form of their leaves always continue. The leaves of the first sort are roundish, and cut at their extremity into angles; whereas those of the second are deeply cut into six or seven lobes, so as to resemble a hand.

The various colours of their flowers being accidental, as also the double flowers being only varieties which have risen from culture, are not by botanists deemed distinct species, so I have not enumerated them here; therefore shall only mention the various colours, which are commonly observed in their flowers; which are white, pale red, deep red, dark red, purple, yellow, and flesh colour.

Although these varieties of double Hollyhocks are not constant, yet where their seeds are carefully saved from the most double flowers, the greatest number of the plants will approach near to the plants from which their seeds were taken, both as to their colour and the fulness of their flowers; provided no plants with single or bad-coloured flowers are permitted to grow near them. Therefore as soon as any such appear, they should be removed from the good ones, that their farina may not spread into the other flowers, which would cause them to degenerate.

These plants, although natives of warm countries, yet are hardy enough to thrive in the open air in *England*, and have for many years been some of the greatest ornaments of our gardens, toward the latter part of summer: but since they have become very common, have not been so much regarded as they deserve; partly from their growing too large for small gardens, and their requiring tall stakes to secure them from being broken by strong winds, to which they are very liable by their tall growth. But in large gardens, where they are properly disposed, they make a fine appearance; for as their spikes of flowers grow very tall, so there will be a succession of them on the same stems, more than two months; the flowers on the lower part of the spike, appearing in *July*, and as their stalks advance, so new flowers are produced till near the end of *September*.

They are propagated by seeds, which, as hath been already observed, should be carefully saved from those plants whose flowers are the most double, and of the best colours. If these are preserved in their capsules until spring, the seeds will be better, provided they are gathered very dry, and care be taken that no damp comes to them in winter, for that will cause their covers to be mouldy, and thereby spoil the seeds.

The seeds should be sown on a bed of light earth, about the middle of *April*, which must be covered about half an inch deep, with the same light earth; some persons sow them in shallow drills, and others scatter the seeds thinly over the whole bed. When they are sown in the former method, the plants generally come up thick, so will require to be transplanted sooner than those which are sown thinly in broad cast. By the first, the seeds may be more equally covered, and kept clean with less trouble, because the ground between the drills may be hoed. When the plants have put out six or eight leaves, they should be transplanted into nursery-beds, at a foot distance from each other, observing to water them until they have taken good root; after which they will require no farther care, but to keep them clean from weeds till *October*, when they should be transplanted where they are to remain.

ALCHEMILLA. Ladies Mantle.

The Characters are,

The flower hath a permanent empalement of one leaf, which is cut into eight segments. It hath no petals, and each flower is succeeded by one seed wrapped up in the empalement.

Dr. *Linnaeus* ranges this genus in his fourth class of plants, entitled *Tetrandria monogynia*.

The Species are,

1. ALCHEMILLA foliis lobatis serratis, segmentis involucri acuto. The common Ladies Mantle.

2. ALCHEMILLA foliis lobatis sericeis acutè serratis, segmentis involucri subrotundis. Smaller silvery Ladies Mantle, with lobated leaves sharply serrated, and the segments of the involucrium cut into roundish segments.

3. ALCHEMILLA foliis digitatis serratis. Flor. Lapp. 62. Silvery Alpine Ladies Mantle with handed leaves.

4. ALCHEMILLA foliis quinatis multifidis glabris. Lin. Sp. Pl. 123. Smooth five-leaved Ladies Mantle, cut into many segments.

The first sort grows naturally in moist meadows in several parts of *England*, but is not very common near *London*. The leaves of this sort are used in medicine, and are esteemed to be vulnerary, drying and binding, and of great force to stop inward bleeding.

The second sort is much smaller than the first, and the leaves are much whiter and appear silky; this sort is different from the third, and always continues so when the plants are propagated by seeds, so that there can be no doubt of its being a distinct species.

The third sort grows naturally on the mountains in *Yorkshire*, *Westmoreland*, and *Cumberland*, generally upon moist boggy places. The leaves of this sort are very white, and deeply cut into five parts like a hand.

The fourth sort grows naturally in *Sweden*, *Lapland*, and other cold countries, so is only to be found in some few curious botanick gardens in this country. These are all abiding plants, which have perennial roots and annual stalks, which perish in autumn. They may be propagated by parting of their roots; the best time for doing this is in the autumn, that their roots may be established before the drying winds of the spring come on. They should have a moist soil and a shady situation, otherwise they will not thrive in the southern parts of *England*.

ALDER-TREE. See *Alnus*.

ALESANDER, or ALEXANDER. See *Smyrnum*.

ALKEKENGI. See *Physalis*.

ALLELUJAH. See *Oxalis*.

ALLIUM. Garlick.

The Characters are,

The flowers are included in one common spathe; they are composed of six concave spreading petals. It hath a three cornered capsule, opening into three parts, having three cells, filled with roundish seeds.

The Species are,

1. ALLIUM caule planifolio bulbifero, radice compositâ, staminibus tricuspидatis. Hort. Upsal. 76. Common or manured Garlick.

2. ALLIUM caule planifolio bulbifero, foliis crenulatis vaginis ancipitibus staminibus tricuspидatis. Hort. Upsal. 77. The Rocambole.

3. ALLIUM scapo nudo semicylindrico foliis lanceolatis petiolatis umbellâ fastigiatâ. Lin. Sp. Plant. 300. Broad-leaved wild Garlick or Rampsons.

4. ALLIUM caule planifolio umbellifero umbellâ globosâ staminibus tricuspидatis radice laterali. Lin. Sp. Pl. 294. Great round headed Garlick of the *Holm Islands*.

5. ALLIUM scapo nudo subcylindrico foliis lanceolatis sessilibus umbellâ fastigiatâ. Hort. Upsal. 76. The yellow Moly.

6. ALLIUM caule planifolio umbellifero ramulo bulbifero staminibus simplicibus. Lin. Sp. Plant. 296. Great broad-leaved Moly with Lilly flowers.

7. ALLIUM scapo nudo ancipiti foliis linearibus subtus convexis lævibus umbellâ subrotundâ staminibus subulatis. Hort. Upsal. 79. Greater Mountain Garlick with leaves like *Narcissus*.

8. ALLIUM scapo nudo ancipiti foliis linearibus caniculatis subtus subangulatis umbellâ fastigiatâ. Hort. Upsal. 79. Garlick with a naked stalk, narrow hollow leaves, which are angular on their lower side, and a compact umbel.

9. ALLIUM caule planifolio umbellifero foliis inferioribus hirsutis staminibus subulatis. Lin. Sp. Pl. 295. Umbelliferous Garlick with hairy under leaves, and awl-shaped stamina, commonly called *Dioscoridis* Moly.

The two first species are easily propagated by planting the cloves, or small bulbs, in the spring, in beds about four or five inches distance from each other, keeping them clean from weeds. About the beginning of *June*, the leaves of the first sort should be tied in knots, to prevent their spindling, or running to seed, which will greatly enlarge the bulb. In the middle of *July*, the leaves will begin to wither and decay, at which time they should be taken out of the ground, and hanged up in a dry room, to prevent their rotting, and may be thus preserved for winter use.

The roots of the second sort may remain in the ground till the leaves are decayed, when their bulbs may be taken up and dried, to be preserved for use during the winter season; but some of the roots may be at the same time planted again for the succeeding year. For this sort requires to be planted in autumn, especially on dry ground, otherwise their bulbs will not be large.

The third sort was formerly in greater esteem than at present, it being rarely cultivated in gardens, but is found wild in moist shady places in many parts of *England*; and may be cultivated by planting the roots in a moist shady border, at almost any time of the year; but the best season is in *July*, just as the green leaves are decaying.

The fourth sort grows naturally in the *Holm Islands*, from whence it has been transplanted into several gardens, where it is preserved more for the sake of variety than use.

The fifth sort was formerly preserved in gardens, for the sake of its yellow flowers, but having a very strong Garlick scent, most people have rooted it out of their gardens.

The sixth sort is also preserved by many persons in their gardens for the sake of variety, but as this hath a

very strong scent, so it is not very often admitted to the flower-garden.

The ninth sort is sometimes permitted to have a place in gardens for the sake of variety.

They are all of them very hardy, and will thrive in almost any soil or situation, and are easily propagated, either by their roots, or from seeds; if from the roots, the best time is in autumn, that they may take good root in the ground before the spring, which is necessary, in order to have them flower strong the following summer. If they are propagated by seeds, they may be sown on a border of common earth, either in autumn, soon after the seeds are ripe, or in the spring following, and will require no farther care, but to keep them clear from weeds; in the following autumn the plants may be transplanted into the borders where they are to remain for good.

These plants produce their flowers in *May, June, and July.*

ALMOND TREE. See *Amygdalus.*

ALMOND DWARF. See *Persica.*

ALNUS. The Alder Tree.

The Characters are,

It hath male and female flowers, which are produced at remote distances on the same plant; the male flowers are digested into a long juli, or katkin, which is loose, imbricated and cylindrical. The female flowers are collected into a conical scaly head, and are succeeded by scaly cones.

The Species are,

1. ALNUS *foliis obversè ovatis rugosis.* The common, or round-leaved Alder.

2. ALNUS *foliis ovato lanceolatis marginibus dentatis.* The long-leaved Alder.

The first sort here mentioned, is the common Alder, which is propagated in *England.* The second sort is very common in *Austria* and *Hungary,* from whence I have been furnished with the seeds. The leaves of this sort are longer, narrower, and not so glutinous as those of the first, nor are they so rough; they are also of a thinner consistence.

These two sorts delight in a moist soil, where few other trees will thrive, and are a great improvement to such lands; they are propagated either by layers, or planting of truncheons about three feet in length. The best time for this is in *February,* or the beginning of *March;* these should be sharpened at one end, and the ground loosened with an instrument before they are thrust into it, lest by the stiffness of the soil the bark should be torn off, which may occasion their miscarriage. These truncheons should be thrust into the earth at least two feet, to prevent their being blown out of the ground by strong winds, after they have made strong shoots. The plantations should be cleared from all such weeds as grow tall, otherwise they will over-bear the young shoots; but when they have made good heads, they will keep down the weeds, and will require no farther care.

If you raise them by laying down the branches, it must be performed in *October;* and by the *October* following, they will have taken roots sufficient to be transplanted out; which must be done by digging a hole, and loosening the earth in the place where each plant is to stand, planting the young tree at least a foot and an half deep, cutting off the top to about nine inches above the surface, which will occasion them to shoot out many branches.

The distance these trees should be placed (if designed for a coppice) is six feet square; and if the small lateral shoots are taken off in the spring, it will very much strengthen your upright poles, provided you leave a few small shoots at distances upon the body thereof, to detain the sap for the increase of its bulk.

These trees may be also planted on the sides of brooks

(as is usual for willows), where they will thrive exceedingly, and may be cut for poles every fifth or sixth year. This wood is in great request with the turners, and will endure a long time under ground, or to be laid in water.

ALNUS NIGRA BACCIFERA. See *Frangula.*

ALOE.

The Characters are,

The flower is of one leaf, which is cut at the top into six parts, which spread open; in the bottom of the flower is the nectarii, and the stamina are inserted in the receptacle.

This genus of plants is by *Dr. Linnæus* ranged in his sixth class, which is titled *Hexandria monogynia.*

The Species are,

1. ALOE *floribus pedunculatis cernuis corymbosis sub-cylindricis.* *Lin. Sp. Plant.* 319. The mitre-shaped Aloe.

2. ALOE *foliis dentatis erectis succulentibus planis maculatis, floribus luteis in thyrso dependentibus.* The common Barbadoes Aloe.

3. ALOE *foliis amplexicaulibus reflexis, margine dentatis, floribus cylindricis caule fruticoso.* Commonly called Sword-Aloe.

4. ALOE *foliis latioribus amplexicaulibus, margine & dorso spinosis, floribus spicatis, caule fruticoso.* Aloe with broader leaves embracing the stalks, whose edges and back are set with spines, flowers growing in spikes, and a shrubby stalk.

5. ALOE *foliis latissimis amplexicaulibus maculatis, margine spinosis floribus umbellatis.* By some called the Sops Aloe, and by others *Carolina Aloe.*

6. ALOE *foliis latioribus amplexicaulibus maculatis margine spinosis floribus spicatis.* Aloe with broad spotted leaves embracing the stalks, whose edges have spines, and flowers growing in a spike.

7. ALOE *foliis ensiformibus inermis ancipitibus floribus laxè spicatis caule fruticoso.* Aloe with sword-shaped smooth leaves, standing two ways, the flowers growing in loose spikes, and a shrubby stalk.

8. ALOE *foliis amplexicaulibus utràque spinosis, floribus spicatis.* Aloe with leaves embracing the stalks, which are prickly on every side, and flowers growing in spikes.

9. ALOE *floribus pedunculatis cernuis racemosis prismaticis ore patulo æquali.* *Lin. Sp. Plant.* 321. Aloe with hanging branching flowers, having foot stalks, and spreading equally at the brim. Commonly called Partridge-breast Aloe.

10. ALOE *foliis erectis subulatis radicans undique inerme spinosis.* *Hort. Cliff.* 131. Aloe with erect awl shaped leaves, set with soft spines on every part.

11. ALOE *floribus sessilibus infundibuli formibus bilabiatis laciniis quinque revolutis summa erecta.* *Lin. Sp. Pl.* 322. Aloe with funnel-shaped flowers, without foot-stalks, opening in two lips, and cut into five segments, which turn backward, and are erect at the top.

12. ALOE *floribus sessilibus ovatis creuatis segmentis interioribus conniventibus.* *Lin. Sp. Pl.* 322. Aloe with oval crenated flowers, without foot stalks, and the interior segments scarce appearing.

13. ALOE *sessilis foliis linguiformibus maculatis floribus pedunculatis cernuis.* This is commonly called Tongue-Aloe.

14. ALOE *floribus sessilibus bilabiatis labio superiore erecto inferiore patente.* *Lin. Sp. Pl.* 322. Commonly called large Pearl Aloe.

15. ALOE *foliis longissimis & angustissimis marginibus spinosis, floribus spicatis.* The Succotrine Aloe.

16. ALOE *caule brevi, foliis amplexicaulibus bifariam versis spinis marginibus erectis floribus capitatis.* Aloe with a short stalk, leaves standing two ways, which embrace the stalk; the spines on the edges erect, and flowers growing in a head.

17. ALOE *sessilis foliis brevioribus planis carnosus apice triquetris marginibus inerme spinosis.* Commonly called Cobweb Aloe.

18. *ALOE foliis ovato-lanceolatis carnosis apice triquetris angulis inermis dentatis. Hort. Cliff. 131.* Aloe with oval spear-shaped fleshy leaves, having three angles at their extremities, which are indented and set with soft spines.

19. *ALOE floribus sessilibus triquetris bilabiatis labio inferiore revoluto. Lin. Sp. Plant. 322.* Aloe with flowers divided into three parts, the under lip being turned back. Commonly called Cushion Aloe.

20. *ALOE sessilis foliis carinatis utraque verrucosis bifariam versis.* Low Aloe with keel-shaped leaves, warted on every part, and standing two ways. Commonly called Pearl-tongue Aloe.

21. *ALOE sessilis foliis carinatis verrucosis apice triquetris carnosis.* Low Aloe with fleshy, keel-shaped, spotted leaves, which are triangular at their extremities.

22. *ALOE foliis latis undulatis maculosis floribus spicatis infundibuli formibus limbo revolutis.* Aloe with broad spotted waved leaves, and funnel-shaped flowers growing in spikes, which are turned back at their brim. Commonly called Guinea Aloe.

23. *ALOE pumila, foliis longis angustis integerrimis maculatis radice repente.* Low Aloe with long narrow entire leaves, which are spotted, and a creeping root. Commonly called Ceylon Aloe.

24. *ALOE foliis amplexicaulibus nigricantibus undique spinosis.* Aloe with dark green leaves embracing the stalks, which are beset with spines on every side. Commonly, but falsely called *Aloe ferox*.

25. *ALOE floribus sessilibus reflexis imbricatis prismaticis. Lin. Sp. Plant. 323.* Aloe with reflexed flowers growing close to the stalk, in form of a prism, lying over each other like tiles on a house. Commonly called *Iris uvaria*.

The first, third, and eighteen next following sorts, are so hardy as to be kept in a warm dry green-house in winter, and may be placed in the open air in summer, in a sheltered situation; but then the plants should not have much wet, for that will rot their stems. But with this management the plants will not grow so fast, as when they are placed in a stove, though they will be stronger, and their stems will support their heads much better, nor will their leaves be so much drawn as those which are more tenderly treated, therefore this management should be preferred.

The fifth, sixth and seventh sorts grow from one to the height of two or three feet; the leaves of the fifth and sixth are generally a foot or more in length, being broad at their base, ending in acute points: they are armed with spines on their edges, and spread out on every side of their stems. The seventh has pliable blunt leaves without spines, the stalk will rise three feet high, and put out several heads. The eighth sort seldom rises more than a foot high, putting out from the stalk many clustering heads; the leaves are armed with short spines on every side, but those on the under side are short. This sort does not flower so frequently as many of the other.

The ninth, tenth, eleventh, twelfth, thirteenth, fourteenth, seventeenth, eighteenth, nineteenth, twentieth, and twenty-first sorts are plants of smaller growth; these seldom rise more than a foot high, and some of them not more than half that height; their leaves are of very different shapes, some of them have tongue-shaped leaves, and others have thick succulent leaves, for the most part terminating in an awl-shaped point. These sorts flower every year, and some of them flower two or three times in a year.

They are all of them hardy enough to live through the winter in a good green-house, provided they have not too much water; for wet in winter, will soon destroy these plants when they have no warmth in cold weather. In summer they may be exposed in the open air for about three months, during which time they should be gently watered twice a

week in dry weather. But if the autumn should prove cold and wet, they should be removed into shelter earlier than in a dry season; for if they get too much moisture, they are very apt to rot in the winter when they have no artificial heat.

The second sort is very common in the islands of *America*, where the plants are propagated upon the poorest land, for to obtain the Hepatic Aloes, which is brought to *England*, and is used chiefly for horses, being too coarse for medicine.

The leaves of this sort are about four inches broad at their base, where they are near two inches thick, and diminish gradually to a point. The leaves are of a pale sea-green colour, and when young are spotted with white. The flower-stem rises near three feet high, and the flowers stand in a slender loose spike, with very short foot-stalks, and hang downwards. This sort is too tender to live through the winter in our climate, in a common green-house; therefore it should be placed in a stove kept to a moderate degree of warmth in that season. I have known plants of this kind, which have had an oiled cloth tied about their roots, and hung up in a warm room more than two years, and afterwards planted in pots, which have grown very well, from whence the plant has been called *Sempervivum* by the inhabitants of *America*.

Although the third sort will live through the winter in a good green-house, yet it will not flower unless it is placed in a moderate share of warmth; for the flowers of this sort appear in *December*, when they make a fine appearance.

The fourth sort is somewhat like the third, but the leaves are broader, and have several spines on their backs towards their extremities. The flowers of this grow in a looser spike, and the plants never put out any suckers, so that it is very difficult to increase.

The fifteenth sort is the true Succotrine Aloe, from whence the best sort of Aloe for use in medicine is produced. This has long narrow succulent leaves, which come out without any order, and form large heads. The stalks grow three or four feet high, and have two, three, and sometimes four of these heads, branching out from it: the flowers of this sort are generally in the winter season. It will live through the winter in a warm green-house, but the plants so managed will not flower so frequently, as those which have a moderate degree of warmth in winter.

The twenty-second sort hath knobbed creeping fleshy roots, which spread over the pots; the leaves come up single, are narrow at bottom, wide in the middle, where they are waved on their edges, and decrease again at their extremities; they are about a foot and an half long, and four inches wide in their broadest part; these are of a dark green colour, marbled over with white. The flower-stem arises immediately from the root, grows about two feet high, the upper part being closely set with very white flowers which are tubulous, and cut into six parts, which are reflexed back, so as to have much of the appearance of a large single Hyacinth. This plant increases plentifully by its creeping roots, but is very tender, so must constantly remain in the stove. It usually flowers in *July*.

The twenty-third sort is a low plant with creeping fleshy roots, the leaves are about nine inches long, and one and an half broad at the bottom, gradually diminishing to the top, where it ends in a point. This sort rarely produces any flowers in *Europe*, but increases very plentifully by offsets.

The twenty-fourth sort rises to the height of eight or ten feet, with a strong stem; the leaves grow on the top, which closely embrace the stalk; these come out irregularly, and spread every way; they are near four inches broad at their base, and diminish gradually to the top, where they end in a spine. These are near two feet long, of a dark green colour,

four, and closely beset with short thick spines on every side. This sort hath not as yet flowered in *England*, nor does it put out suckers, so that it is difficult to increase. It must have a warm green-house in winter, and very little water.

The twenty-fifth sort hath very long narrow triangular leaves, shaped like those of the Bullrush; the flowers are produced in close thick spikes, upon stalks near three feet high. They are of an Orange-colour, so that when the plants are strong, and produce large spikes, they make a fine appearance. It flowers in *August* and *September*; and will live through the winter, in a warm border, close to a south-aspected wall.

The soil in which these plants thrive best, is one half fresh light earth from a common (and if the turf is taken with it and rotted, it is much better); the rest should be white sea sand and sifted lime rubbish, of each of these two a fourth part; mix these together six or eight months at least before it is used, observing to turn it over often in this time.

The middle of *July* is a very proper season to shift these plants; at which time you may take them out of the pots, and with your fingers open the roots, and shake out as much of the earth as possible, taking off all dead or mouldy roots, but do not wound or break the young fresh ones: then fill the pot about three parts full of the above-mentioned earth, putting a few stones in the bottom of the pot, to drain off the moisture; and after placing the roots of the plant in such a manner as to prevent their interfering too much with each other, put in as much of the same earth, as to fill the pot almost to the rim, and observe to shake the plant, so as to let the earth in between the roots; and then with your hand settle it close to the roots of the plant, to keep it steady in the pot; then water them gently, and set them abroad in a shady place, where they may remain for three weeks, giving them gentle waterings, if the weather should prove hot and dry.

Toward the latter end of *September*, in a dry day, remove them into the house again, observing to give them as much free open air as possible, while the weather holds warm; but, if the nights are cool, you must shut up the glasses, and give them air only in the day; and, as the cold increases, you must decrease opening the glasses, but observe to give them gentle waterings often, till the middle of *October*, when you must abate them, according to the heat of the house in which they are kept. For those plants which are placed in a stove, will require to be watered at least once a week, most part of the winter; whereas those which are kept in a green-house without artificial heat, should not be watered oftener in winter than once a month.

The tender sorts should constantly remain in the stove, or be removed in the summer to an airy glass case, where they may have free air in warm weather, but be protected from rain and cold. With this management the plants will thrive and increase, and such of them as usually flower, may be expected to produce them in beauty at their seasons.

Most of these Aloes are increased by offsets, which should be taken from the mother-plant, at the time when they are shifted, and must be planted in very small pots, filled with the same earth as was directed for the old plants; but if, in taking the suckers off, you observe that part which joined to the mother root to be moist, you must let them lie out of the ground in a shady dry place for about a week, to dry before they are planted, otherwise they are very subject to rot.

After planting, let them remain in a shady place (as was before directed in shifting the old plants) for a fortnight, when you should remove the tender kinds to a very moderate hot bed, plunging the pots therein, which will greatly facilitate their taking new root; but observe to

shade the glasses in the middle of the day, and to give them a great share of air.

Toward the middle of *August*, begin to harden these young plants, by taking off the glasses in good weather, and by raising them at other times with props, that the air may freely enter the bed, which is absolutely necessary for their growth, and to prepare them to be removed into the house, which must be done toward the end of *September*, and managed as before directed for the old plants.

The *African Aloes*, for the most part, afford plenty of suckers, by which they are increased; but those few that do not, may be most of them propagated, by taking off some of the under leaves, laying them to dry for ten days or a fortnight, as was directed for the offsets; then plant them in the same soil as was directed for them, putting that part of the leaf which did adhere to the old plant, about an inch, or an inch and an half (according to the size of the leaf) into the earth, giving them a little water to settle the earth about them; then plunge the pots into a moderate hot-bed, observing to screen them from the violence of the sun, and give them gentle refreshings with water once in a week or ten days. The best season for this is in *June*, that they may push out heads before winter.

ALOE AMERICANA MURICATA. See Agave.

ALOIDES. See Stratiotes.

ALPINIA.

The Characters are,

The flower has one stamina and one style; it is cut into six parts at the top, and has a swelling tube with three spreading lobes.

We know but one species of this genus, viz.

ALPINIA. Royen. Prod. 12. White branching Alpinia, with leaves like the flowering Reed.

This plant is a native of the *West-Indies*, from whence it has been brought into some of the curious gardens of *Europe*, where it must be preserved in a warm stove, and the pots plunged into a hot-bed of tanners bark, otherwise it will not thrive in this country. The leaves decay every winter, and are pushed out from the roots every spring, like the Ginger and Maranta; so should be managed in the same manner as is directed for those two plants, and may be propagated by parting of the roots when the leaves decay. It grows naturally in moist places in the *West-Indies*.

ALSINE. Chick-weed.

There are several species of this plant, which are common in cultivated places, and on dunghills. These being so well known to most persons, it will be needless to mention the species in this place.

ALTHÆA. Marshmallow.

The Characters are,

The flower has a double calyx; the outer is cut into nine segments. It hath several capsules, each containing one seed.

The Species are,

1. ALTHÆA foliis simplicibus acuminatis acutè dentatis tomentosis. Common Marshmallow.

2. ALTHÆA foliis trifidis piloso-hispidis. Hort. Cliff. 349. Marshmallow with trifid hairy pungent leaves.

3. ALTHÆA foliis inferioribus palmatis superioribus digitatis caule fruticoso. Hort. Upsal. 205. Marshmallow with the under leaves shaped like a hand, the upper leaves more divided, and a shrubby stalk.

The first sort is the common Marshmallow, which grows naturally in moist places in divers parts of *England*, and is frequently used in medicine. This hath a perennial root and an annual stalk, which perishes every autumn. The stalks of this plant grow erect, to the height of four or five feet; these are garnished with leaves which are hoary and soft to the touch, and placed alternately on the branches; the

the flowers come out from the wings of the leaves, which are shaped like those of the Mallow, but are smaller and of a pale colour. It may be propagated fast enough, either by seeds or parting of their roots. When it is propagated by seeds they should be sown in the spring, but if by parting of the roots, the best time is in autumn, when the stalks decay. It will thrive in any soil or situation, but in moist places will grow larger than in dry land.

The second sort grows naturally in *Spain* and *Portugal*, from both of these countries I have received the seeds. This is a low plant, whose branches trail on the ground, unless they are supported by stakes. The leaves and stalks are beset with strong hairs, the flowers come out at the wings of the stalks, and are smaller than those of the common sort, having purplish bottoms.

If the seeds of this sort are sown in *April*, the plants will flower in *July*, and the seeds ripen in *September*. They should be sown in the places where they are to remain, for as the roots shoot deep into the ground, so unless the plants are removed very young, they seldom survive transplanting.

The third sort has a woody stem, which rises to the height of four or five feet, and puts out many side branches. The flowers come out from the wings of the stalks in the same manner as the other sorts, but are not so large as those of the common Marshmallow; they are of a deeper red colour, and the empalement is much larger. This sort seldom flowers the first year, unless the summer proves warm; but when the plants live through the winter, they will flower early the following summer, so will produce good seeds. This grows naturally in *Hungary* and *Istria*, from both which places I have received the seeds.

It is propagated by seeds, which should be sown in the spring, in the place where the plants are to remain; or if otherwise, the plants must be transplanted young, else they will not succeed. They should have a sheltered situation and a dry soil, otherwise they will not live through the winter in *England*. When these plants grow in a stony soil, or in lime rubbish, they will be stunted in their growth, but they will have less sap in their branches, so will better endure the cold of this climate. This sort seldom continues longer than two years in *England*, but the seeds ripen here in kindly seasons.

ALTHÆA FRUTEX. See *Hibiscus* and *Lavatera*.

ALYSSOIDES. See *Alyssum* and *Lunaria*.

ALYSSON ALPINUM LUTEUM. See *Draba*.

ALYSSON SEGETUM. See *Myagrum*.

ALYSSON SERPILLI FOLIO. See *Clypeola*.

ALYSSON VERONICÆ FOLIO. See *Draba*.

ALYSSUM. Madwort.

The Characters are,

The flower hath four petals in form of a cross; it hath six stamina, two of which are shorter than the other four. The flower is succeeded by an indented compressed pod.

The Species are,

1. ALYSSUM caulibus frutescentibus paniculatis foliis lanceolatis undulatis integris. *Prod. Leyd.* 331. Madwort with shrubby stalks, flowers growing in panicles, and whole spear-shaped waved leaves.

2. ALYSSUM foliis lanceolato-linearibus acutis integerrimis caulibus procumbentibus perennantibus. *Hort. Cliff.* 333. Madwort with whole spear-shaped pointed leaves, and trailing perennial stalks.

3. ALYSSUM ramis senilibus spiniformibus nudis. *Hort. Cliff.* 332. Madwort, whose older branches have naked spines.

4. ALYSSUM ramis suffruticosis diffusis foliis punctato echinatis. *Hort. Ups.* 185. Madwort with shrubby diffused branches and leaves, having prickly punctures.

5. ALYSSUM caule erecto foliis lanceolatis incanis integerrimis floribus corymbosis. *Hort. Cliff.* 332. Hoary shrubby Madwort.

6. ALYSSUM caule erecto herbaceo filiculis sessilibus ovalibus compresso planis petalis acuminatis. *Lin. Sp. Plant.* 651. Madwort with an erect herbaceous stalk, pods growing close to the stalks, which are oval and compressed, and the flower leaves pointed.

7. ALYSSUM caule herbaceo foliis lanceolatis dentatis filiculis inflatis. *Lin. Sp. Plant.* 651. Madwort with an herbaceous stalk, spear-shaped indented leaves, and swollen seed vessels.

The first sort is a low perennial plant, with a thick fleshy stem, which seldom rises more than one foot high, but divides into many less branches which spread on the ground. The branches are garnished with long spear-shaped leaves, which are hoary and waved on their edges, and continue through the year. The flowers are produced in loose panicles, at the extremity of every branch, and are of a bright yellow colour, consisting of four petals, which are placed in form of a cross: these being numerous, make a fine appearance during their continuance. They appear the latter end of *April*, or the beginning of *May*, and if the season is moderate, will continue three weeks in beauty.

This plant is hardy, and although brought from a more southerly climate, yet, if planted in a dry, lean, or rubbishy soil, will endure our severest winters abroad. It is increased by sowing the seeds in *March* in a light sandy soil, or by planting cuttings in *April* or *May*; which are very apt to take root, if kept shaded in the heat of the day, and gently refreshed with water.

The second sort seldom continues above two or three years with us, and must therefore be often sown to preserve it; or if the seeds are suffered to fall, and remain upon the ground, the plants will rise without any trouble. It produces, at the extremity of its branches, very pretty tufts of small white flowers. This will also grow from cuttings, if planted and managed as the former.

The third sort hath lignous branches, which rise about two feet high; these are armed with small spines; the leaves are hoary, spear-shaped, and thinly placed on the stalks without any order. The flowers are white, cross-shaped, and grow in small clusters at the extremity of the branches.

This may be propagated in the same manner as the first sort, either by seeds or slips; and when the plants grow in rubbish, or on old walls, they will last much longer, and endure the cold of our winters, better than those which are in a good soil. It grows naturally in *Spain*, *Italy*, and the south of *France*.

The fourth sort hath trailing branches, which lie on the ground; these are garnished with oblong hoary leaves, which are rough to the touch. The flowers are produced in small clusters at the extremity of the branches, which are of a dark yellow colour, and are succeeded by seed vessels shaped like those of the third sort. This grows naturally upon rocks and ruins, in *Burgundy*, and some other parts of *France*, as also about *Basil*. It may be propagated in the same manner as the former sorts, and when it grows in rubbish, the plants will continue some years; but in rich ground, they seldom live through the winter in *England*.

The fifth sort grows to the height of two feet, having lignous stalks, which divide into several branches toward the top. These are garnished with hoary spear-shaped leaves, which are placed alternately on the branches: at the extremity of every shoot, the flowers are produced in round bunches, which are small, white, and cross-shaped. This plant grows naturally in the south of *France*, *Spain*, and *Italy*, chiefly on rocky or gravelly soils. It flowers in *June*, *July*, *August*, and *September*, and the seeds ripen soon after; which if permitted to scatter, the plants will come up, and require little care.

The sixth sort is a biennial plant, with oblong hoary leaves, placed alternately; the flowers come out from the wings of the stalks single; these grow very close to the stalk, and are succeeded by oval compressed seed vessels, shaped like those of the Lunaria, which contain many flat seeds. It is propagated by seeds, which must be sown upon dry ground, or lime rubbish, and treated like the former sorts.

The seventh sort is a low spreading plant, garnished with oblong hoary leaves which continue through the year: the flowers are produced in small clusters at the extremity of the branches; these are of a bright yellow colour, consisting of four petals placed in form of a cross. This sort grows naturally in the islands of the *Archipelago*, but is hardy enough to live in the open air in *England*, in a dry soil and a warm situation. It is propagated by seeds, and seldom lasts longer than two or three years.

AMARANTHOIDES. See *Gomphrena*.

AMARANTHUS. Amaranth, or Flower-gentle.

The Characters are,

It hath male and female flowers in the same plant. The flower hath no petals, but the empalement consists of three or five leaves; this is common to both sexes. The male flowers have in some species three, and in others five slender stamina. The female flowers have three short styles. The seed vessel has one cell, in which is lodged a single globular seed.

The Species are,

1. AMARANTHUS *capitellis triandris subrotundis amplexicaulibus foliis lanceolatis acuminatis*. *Lin. Sp. Pl.* 989. The *Amaranthus tricolor*.

2. AMARANTHUS *capitellis triandris subrotundis sessilibus foliis lanceolatis sparsis*. *Lin. Sp. Plant.* 989. *Amaranthus bicolor*.

3. AMARANTHUS *racemis pentandris cylindricis pendulis longissimis*. *Hort. Cliff.* 443. Flower-gentle with five stamina, and very long hanging cylindrical spikes.

4. AMARANTHUS *racemis cylindricis pendulis, caule erecto arboreo*. This is the tree *Amaranthus*.

The first sort has been long cultivated in gardens for the beauty of its variegated leaves, which are of three colours, *viz.* green, yellow, and red; these are very elegantly mixed, and when the plants are in full vigour, the leaves are large, and closely set from the bottom to the top of the stalks, and the branches form a sort of pyramid; so that there is not a more beautiful plant than this, when it is in full lustre. From the leaves of this plant being party-coloured, like the feathers of parrots, some botanists have separated this species from the others, and constituted a genus of it, by the title of *Psittacus*.

The second sort hath been introduced into the *English* gardens much later than the former. This grows to the same height with the former, and in the manner of its growth greatly resembles it; but the leaves have only two colours, which are an obscure purple, and a bright crimson; these are so blended as to set off each other, and when the plants are vigorous, they make a fine appearance.

The third sort grows naturally in *America*, from whence I received the seeds: this grows with an upright stem, upward of three feet high; the leaves and stalks are of a pale green colour; the spikes of the flowers are produced from the wings of the stalks, and also in clusters at the extremity of the branches: they are very long and hang downward, being of a bright purple colour. I have measured some of these spikes, which were two feet and an half long, so that many of them have reached the ground.

The fourth sort hath a strong stem, which rises to the height of seven or eight feet, sending forth many horizontal branches toward the top; these are garnished with oblong rough green leaves. At the extremity of every shoot, the

cylindrical spikes of a purple colour are produced, which hang downward, but these are seldom half the length of those of the former sort, and are much thicker. This is the sort of *Amaranth*, which is directed by the College to be used in medicine.

These two sorts must be raised upon a hot-bed, and in *June* they may be planted into the borders of the pleasure-garden; shading them till they have taken new root, and in dry weather they should be watered. The third sort seldom fails to ripen its seeds in the open air, but the fourth sort seldom ripens its seeds abroad when the autumn proves cold and wet; therefore one plant of this sort should be potted, to be removed to shelter early in the autumn to obtain good seeds.

The first two sorts of *Amaranths* must be sown on a good hot-bed in *February*, or the beginning of *March* at farthest; and in about a fortnight's time, if the bed is in good temper, the plants will rise; when you must prepare another hot-bed, covered with good rich light earth, about four inches thick; when this bed is in a proper temper to receive the young plants, you should raise them up with your finger, so as not to break off the tender roots, and prick them into your new hot-bed about four inches distance every way, giving them a gentle watering to settle the earth to their roots; but in doing this, be very cautious not to bear the young plants down to the ground by hasty watering, which rarely rise again, or at least so as to recover their former strength in a long time, but very often rot in the stems, and die quite away.

In the middle of the day keep them screened with mats from the great heat of the sun, and give them air by raising up the glasses with a small stone; and, if the glasses are wet, it will be proper to turn them every day, in good weather, that they may dry; for the moisture which is occasioned by the fermentation of the dung, and perspiration of the plants, is of a noxious quality, and very unkindly to plants; so that if the weather happens to prove bad, that you cannot turn your glasses, it will be of great service to your plants to wipe off all the moisture two or three times a day with a woollen cloth, to prevent its dropping upon the plants. When your plants are firmly rooted, and begin to grow, you must observe to give them air every day, more or less, as the weather is cold or hot, to prevent their drawing up too fast, which greatly weakens their stems.

In about three weeks or a month's time, these plants will have grown so as to meet, and will stand in need of another hot-bed, which should be of a moderate temper, and covered with the same rich earth about six inches thick, in which they should be removed, observing to take them up with as much earth about their roots as possible, and plant them seven or eight inches distance every way, giving them some water to settle the earth about their roots; but be very careful not to water them heavily, so as to bear down the plants, as was before directed; and keep them shaded in the heat of the day, until they have taken fresh roots; and be sure to refresh them often gently with water, and give them air in proportion to the heat of the weather, covering the glasses with mats every night, lest the cold chill your beds, and stop the growth of the plants.

In the beginning of *May* you must provide another hot-bed, which should be covered with a deep frame, that your plants may have room to grow. Upon this hot-bed you must set as many three-penny pots as can stand within the compass of the frame; these pots must be filled with good rich earth, and the cavities between each pot filled up with any common earth, to prevent the heat of the bed from evaporating, and filling the frame with noxious steams; then with a trowel, or some such instrument, take up your plants from the former hot-bed, with as much earth as possible to their

their roots, and place each single plant in the middle of one of the pots, filling the pot up with the earth before described, and settle it close to the root of the plant with your hands; water them gently, as before, and shade them in the heat of the day from the violence of the sun, by covering the glasses with mats; refresh them often with water, and give them a good quantity of air in the day-time.

In about three weeks more these plants will have grown to a considerable size and strength, so that you must now raise the glasses very much in the day-time; and when the air is soft, and the sun is clouded, draw off the glasses, and expose them to the open air, and repeat this as often as the weather will permit; which will harden them by degrees, to be removed abroad into the places where they are to remain the whole season; but it is not adviseable to set these plants out until a week in *July*, observing to do it when the air is perfectly soft, and, if possible, in a gentle shower of rain.

Let them at first be set near the shelter of a hedge for two or three days, where they may be screened from the violence of the sun, and strong winds, to which they must be inured by degrees. These plants, when grown to a good stature, perspire very freely, and must be every day refreshed with water, if the weather proves hot and dry; otherwise they will flint, and never produce so large leaves, as those which are skilfully treated.

This is the proper management, in order to have fine Amaranths; which, if rightly followed, and the kinds are good, in a favourable season, will produce wonderful large fine leaves, and are the greatest ornament to a good garden for upwards of two months.

There are many more species of this genus, which grow naturally in the two *Indies*, where some of them are cultivated as esculent plants; one of which the inhabitants title *Breda*, the other *Cullulu*, but as these are plants of no beauty, so they are rarely kept in gardens here.

AMARANTHUS CRISTATUS. See Celosia.

AMARYLLIS. Lily-daffodil.

The Characters are,

It hath an oblong compressed spathe, which incloses the flower-buds; it hath six awl shaped stamina with incumbent summits. The germen turns to an oval capsule, opening in three parts, having three cells.

The Species are,

1. AMARYLLIS *spatha uniflora, corolla aequali, staminibus declinatis*. Lin. Commonly called Autumnal Narcissus.

2. AMARYLLIS *spatha uniflora, corolla aequali, pistillo declinato*. Hort. Cliff. 135. Commonly called *Atamusco* Lily.

3. AMARYLLIS *spatha uniflora, corolla inaequali, genitalibus declinatis*. Hort. Cliff. 135. Commonly called *Jacobaea* Lily.

4. AMARYLLIS *spatha multiflora, corollis revolutis genitalibus strictis*. Hort. Upsal. 75. Commonly called *Guernsey* Lily.

5. AMARYLLIS *spatha multiflora, corollis campanulatis aequalibus, genitalibus declinatis*. Hort. Cliff. 135. Commonly called *Belladonna* Lily.

6. AMARYLLIS *spatha multiflora, corollis campanulatis marginibus reflexis genitalibus declinatis*. Commonly called *Mexican* Lily.

7. AMARYLLIS *spatha multiflora, corollis campanulatis aequalibus, scapo compresso longitudini umbellae*. Flor. Leyd. 36. Lily Daffodil with many flowers in one cover; the petals equal, and the cover compressed the length of the umbel.

8. AMARYLLIS *spatha multiflora, corollis campanulatis aequalibus, scapo tereti ancipiti*. Flor. Leyd. 36. Commonly called the *Ceylon* Lily.

9. AMARYLLIS *spatha multiflora, foliis ciliatis*. Flor. Leyd. 37. Commonly called the *African* Scarlet Lily.

10. AMARYLLIS *spatha uniflora, corolla aequali, staminibus erectis*. Commonly called Spring yellow Lily Narcissus.

11. AMARYLLIS *spatha multiflora corollis inaequalibus foliis linguiformibus*. Buttn. Lily Daffodil with many flowers in a cover, whose petals are unequal, and leaves shaped like a tongue; or the *Brunswigia* of Dr. Heister.

The first sort is a very hardy plant, which increases very fast by offsets. The season for transplanting these roots is any time from *May* to the end of *July*, when their leaves are decayed, after which it will be too late to remove them; for they will begin to push out new fibres by the middle of *August*, if the season be moist, and many times they flower the beginning of *September*; so that if they are then transplanted, it will spoil their flowering. This plant will grow in any soil or situation; but it will thrive best in a fresh light dry soil, and in an open situation, *i. e.* not under the dripping of trees, nor too near to walls. It is commonly called by the gardeners, the yellow Autumnal Narcissus, &c. and is usually sold by them with Colchicums, for autumnal ornaments to gardens; for which purpose this is a pretty plant, as it will frequently keep flowering from the middle of *September* to the middle of *November*, provided the frost is not so severe as to destroy the flowers; for although there is but one flower in each cover, yet there is a succession of flowers from the same root, especially when they are suffered to remain three or four years unremoved. The flowers seldom rise above three or four inches high; it is shaped somewhat like the flowers of the large yellow Crocus; these have their green leaves come up at the same time, like the Saffron, and after the flowers are past, the leaves increase all the winter. The roots are bulbous, and shaped like those of the Narcissus.

The tenth sort is more rare in *England* than any of the other, at present. It was formerly in several curious gardens, but as it flowers at a season when there are so many finer sorts in beauty, so it was neglected and cast out of the gardens, whereby it is almost lost in *England*: it grows naturally in *Spain* and *Portugal*, where it flowers early in *January*. This is as hardy as the first sort, and may be planted in the open borders, and treated in the same manner. It should not be taken out of the ground to transplant, till the end of *July*, or the beginning of *August*.

The second sort is a native of *Virginia* and *Carolina*, in which countries it grows very plentifully in the fields and woods, where it makes a beautiful appearance when it is in flower, which is in the spring. The flowers of this sort are produced single, and at their first appearance have a fine Carnation colour on their outside; but this fades away to a pale, or almost white, before the flowers decay. This plant is so hardy, as to thrive in the open air in *England*, provided the roots are planted in a warm situation, and on a dry soil; it may be propagated by offsets from the roots, which they put out pretty plentifully, especially if they are not transplanted oftener than once in three years.

The third sort, which is commonly called *Jacobaea* Lily, is now become pretty common in the curious gardens in *England*, the roots sending forth plenty of offsets, especially when they are kept in a moderate warmth in winter: for the roots of this kind will live in a good green-house, or may be preserved through the winter under a common hot-bed frame; but then they will not flower so often, nor send out so many offsets, as when they are placed in a moderate stove in winter. This sort will produce its flowers two or three times in a year, and is not regular to any season; but from *March* to the beginning of *September*, the flowers will be produced when the roots are in vigour. There is never more than one flower produced on the same stalk: These flowers are large, and of a very deep red; the under petals, or flower leaves, are very large; and the whole

whole flower stands nodding on one side of the stalk, making a beautiful appearance.

It is propagated by offsets, which may be taken off every year; the best time to shift and part these roots is in *August*, that they may take good root before winter; in doing of this, there should be care taken not to break off the fibres from their roots. They should be planted in pots of a middling size, filled with light kitchen garden earth; and if they are kept in a moderate degree of warmth, they will produce their flowers in plenty, and the roots will make great increase.

The sixth sort, which is commonly called the *Mexican Lily*, is not quite so hardy as the former sort, so must be placed in a warm stove; and if the pots are plunged into a hot-bed of tanners bark, the roots will thrive better, and the flowers will be strong. This sort is increased by offsets, as the others of this tribe; and it flowers usually the beginning of spring, when it makes a fine appearance in the stove; the flower-stems of this sort, seldom rise more than one foot high, each stem supports two, three, or four flowers, rarely more than that number. The flowers are large, and of a bright copper colour, inclining to red.

The eighth sort is also tender, and must be treated in the same manner as the sixth; this is more common in the gardens in *Holland* than in this country; and as it is a plant which increases but slowly, will not be very common here. This flowers usually in *June* and *July*, and sometimes the same root will flower again in autumn; for if the pots are plunged in a bed of tanners bark, the roots generally flower twice every year, but the flowers are not of long duration.

The seventh and ninth sorts are more hardy, and may be treated in the same manner as the *Jacobæa Lily*; these will increase pretty fast by offsets, when they are properly managed, especially the ninth, which sends out many offsets, so as to fill the pots with roots, but it seldom flowers in *England*. The petals of the flower turn back like those of the *Guernsey Lily*, but are of a lighter colour, rather inclining to scarlet; the roots of this are small.

The eleventh sort is figured by *Ferrarius* in his *Garden of flowers*, as also by *Morrison* in his *History of plants*; but *Dr. Heister* has separated it from this genus, and has constituted a new genus by the title of *Brunswigia*, in honour to the duke of *Brunswick*.

This grows naturally at the *Cape of Good Hope*, from whence I have received the roots, which have succeeded in the *Chelsea* garden.

This sort may be treated in the same manner, as hath been directed for the *Jacobæa Lily*, with this difference only, of placing it in winter in a stove, where there is a moderate share of warmth, for the roots of this will not endure so much cold as those, nor should they have so much water given them.

The best time to transplant these roots is about the beginning of *August*, when their leaves are quite decayed, and before they put out new fibres, for it will be very improper to remove them afterwards.

All these bulbous-rooted flowers delight in a loose sandy earth, mixed with good kitchen garden mould; and in the culture of them there should be but little water given them at those times when their leaves decay, and the roots are not in a growing state; for much moisture at that time will often cause them to rot; but when they are growing, and putting out their flower-stems, they should be frequently refreshed with water, but not given in too great quantities at a time. The pots, with the tender sorts, should constantly be kept in the stove; and in summer they should have as much free air as possible; for although some of these sorts may be kept abroad in summer, yet those do not

thrive so well, nor flower so constantly, as those which are treated in the manner here described.

The sixth sort, which is called the *Belladonna Lily*, was brought to *England* from *Portugal*, where the gardens did some years ago abound with these flowers; for the roots increase very fast, especially in such countries where they live in the open air. This plant thrives so well in *Italy*, as to need no other culture than the common *Lily*; and although it does not flower till *August*, yet it commonly produces good seeds in that country, from which they propagate them in great plenty; but with us they require more care, otherwise they cannot be preserved.

The method in which I have cultivated this plant for some years past, with great success, is as follows. I prepared a border next a south west-affected wall, of about six feet wide, in the following manner, *viz.* I removed all the earth to the depth of three feet, then I put some very rotten dung in the bottom, six inches thick, upon which I laid light garden mould about twenty inches deep; after making this level, I placed the roots at six inches distance every way, and then covered them over with light sandy earth, to the height of the border, whereby the upper part of the roots were five or six inches buried, and in the winter I covered the border all over with rotten tanners bark, three inches deep, to prevent the frost from penetrating the ground; and when the frost was very severe, I laid some mats or straw over the leaves to protect them from being killed. With this management the roots have greatly increased, and have constantly flowered every year; some of them have put out two or three stems, which grew near three feet high, and produced many flowers in each umbel, which have made a fine appearance during the month of *October*. This plant produces its flowers in *October*, and the green leaves come up soon after, and abide all the winter and spring until *June*, at which time they decay; soon after which the roots should be transplanted.

The fourth sort is supposed to come originally from *Japan*, but has been many years cultivated in the gardens of *Guernsey* and *Jersey*; in both which places, they seem to thrive as well as if it was their native country; and from those islands their roots are sent annually to the curious in most parts of *Europe*, and are commonly called *Guernsey lilies*.

When these roots come over, they should be planted in pots filled with fresh light sandy earth, mixed with a little very rotten dung, and placed in a warm situation, observing now and then to refresh the earth with water. About the middle or end of *September*, such of the roots as are strong enough to flower, will begin to shew the bud of their flower-stem (which is commonly of a red colour); therefore you should remove these pots into a situation where they may have the full benefit of the sun, and may be sheltered from strong winds: but by no means place them too near a wall, nor under glasses, which would draw them up weak, and render them less beautiful. At this season they should be gently refreshed with water, if the weather be warm and dry; but if it should prove very wet, they should be screened from it.

When the flowers begin to open, the pots should be removed under shelter, to prevent the flowers from being injured by too much wet: but they must not be kept too close, nor placed in a situation too warm, which would occasion their colour to be less lively, and hasten their decay. The flowers of this plant will continue in beauty (if rightly managed) a full month; and though they have no scent, yet, for the richness of their colour, they are justly esteemed in the first rank of the flowery race.

After the flowers are decayed, the green leaves will begin to shoot forth in length, and if sheltered from severe cold

cold, will continue growing all the winter; but they must have as much free air as possible in mild weather, and be covered only in great rains or frosts; for which purpose, a common hot-bed frame is the properest shelter for them; under which if they are placed, the glasses may be taken off constantly every day in dry open weather, which will encourage the leaves to grow strong and broad; whereas when they are placed in a green-house, or not exposed to the open air, they will grow long and slender, and have a pale weak aspect, whereby the roots will become weak, so that it seldom happens that they produce flowers under such management.

When a person is possessed of a large number of these roots; it will be troublesome to preserve them in pots, therefore there should be a bed prepared of the following earth, in some well sheltered part of the garden, *viz.* Take a third part of fresh virgin earth from a pasture ground, which is light, then put near an equal part of sea sand, to which you should add rotten dung, and sifted lime rubbish, of each an equal quantity. With this earth (when well mixed and incorporated) you should make your bed about two feet thick, raising it about four or five inches above the surface of the ground, if the situation be dry; but if the ground be wet, it should be raised eight or nine inches higher. In this bed, about the beginning of *July* (as was before directed), you should plant the roots about six or eight inches asunder each way; and in the winter, when the frost begins, you should either cover the bed with a frame, or arch it over, and cover it with mats and straw, to prevent their leaves from being pinched with cold; but in the spring the covering may be entirely removed, and the bed kept constantly clear from weeds, during the summer, observing to stir the surface of the earth now-and-then; and every year, when the leaves are decayed, you should sift a little fresh earth over the beds, to encourage the roots. In this bed the roots may remain until they are strong enough to produce flowers, when they may be taken up and planted in pots, as was before directed, or suffered to remain in the same bed to flower.

AMBROSIA.

The Characters are,

It hath male and female flowers on the same plant. The male flowers are of one leaf, funnel-shaped, and cut into five parts at the brim. The female flowers are placed under the male in the same spike: they have no petals, but an oval germen placed in the bottom of the empalement. The germen afterward becomes an oval capsule with one cell, inclosing one roundish seed.

The Species are,

1. AMBROSIA *foliis multifidis racemis solitariis pilosis.* Lin. Sp. Plant. 988. Maritime Ambrosia.
2. AMBROSIA *foliis bipinnatifidis, racemis paniculatis terminalibus glabris.* Hort. Upsal. 284. Tall unfavoury Sea Ambrosia with Mugwort leaves.
3. AMBROSIA *foliis trilobis & quinquelobis serratis.* The largest Virginian Ambrosia, with an eastern Plane Tree leaf.
4. AMBROSIA *foliis bipinnatifidis primoribus ramulorum indivisis integerrimis.* Lin. Sp. Plant. 988. Greatest unfavoury Ambrosia of Virginia, with Water Horehound leaves, which are finely divided.

5. AMBROSIA *foliis pinnatifidis hirsutis racemis solitariis terminalibus, caule fruticoso perenne, i. e.* Ambrosia with hairy winged leaves, single spikes of flowers, growing at the extremity of the branches, and a shrubby perennial stalk.

The first sort grows naturally in the east, near the sea shore; this rises about two feet and an half high, sending out many side branches, whose leaves are divided into many parts, and upon being handled emit a strong odour. The spikes of flowers are produced from the wings of the stalks, which are long, single, and hairy. After the flowers are

past, the female flowers are succeeded by hard leafy capsules having one cell, in which is included a single round seed. This is an annual plant, which seldom perfects its seeds in *England*, unless the plants are brought forward in the spring; therefore the seeds should be sown in the autumn in a warm border, and when the plants come up in the spring, they should be transplanted into another warm border, but not in rich moist land, where they grow very luxuriantly, so do not flower till late in the season, and seldom perfect their seeds. Therefore the best method to obtain good seeds, is to plant some of the plants in pots filled with light earth mixed with lime rubbish, to prevent their luxuriant growth, which will cause them to flower early, whereby good seeds may be obtained.

The second sort grows naturally in the islands of *America*, as also in *Carolina* and *Virginia*; from the two latter countries I have frequently received the seeds. This sort grows more than three feet high, dividing into many branches; these are garnished with winged leaves, in shape like those of Mugwort; at the extremity of each branch, the loose spikes of flowers are produced, composed of one long spike in the middle, and three or four shorter lateral spikes: these have male and female flowers ranged in the same manner as the former; the female flowers are succeeded by seeds of the same shape.

This sort will come up and thrive in the open air in *England*, but the plants so raised will not produce good seeds, unless the season is warm; therefore to obtain them every year, it is necessary to sow the seeds of this plant on a moderate hot-bed in *March*, and when the plants are come up two inches high, they must be transplanted into another hot-bed, observing to water them pretty well, and shade them until they have taken new root; afterward they must have a large share of fresh air every day, when the weather is warm, and frequent waterings, for they are very thirsty plants. When the plants are grown pretty strong, they must be taken up with balls of earth to their roots, and planted in *May* abroad with other hardy annual plants, among which they will make a variety. These plants will flower in *August*, and their seeds ripen in *September*.

The third sort is a native of *North America*, where it is a very common weed. This often grows eight or ten feet high; and if it is planted in a rich moist soil, or is often watered, it will grow much higher, and spread out into many branches. The seeds of this plant, when sown in the spring, seldom come up the first year, but frequently remain in the ground until the following spring; so that when the plants do not come up, the ground must not be disturbed till after the spring following, to wait for the plants coming up. When the plants come up, some of them may be transplanted into a moist soil, allowing them at least four or five feet room every way; and if they are frequently watered in dry weather, they will grow to a large size; but their branches must be supported by stakes, otherwise they are very subject to break with strong winds. These plants are only preserved by such persons as are curious in botany, for the sake of variety.

The fourth sort grows naturally in *North America*, from whence I have frequently received the seeds. The spikes of flowers in this sort are produced from the wings of the stalks, in which this differs from the second. This may be treated in the same manner as the second sort.

The fifth sort is a native of *Peru*. It grows to the height of ten or twelve feet, with a woody stem, dividing into several branches; which are garnished with hairy leaves, composed of several winged lobes, and are placed alternately upon the branches; the spikes of flowers are single, hairy, and are produced at the extremity of the branches. The female flowers are succeeded by hairy capsules, each containing a single seed.

This is a perennial plant, and may be propagated by cuttings or seeds; if by the former, they should be planted in a shady border, in either of the summer months. In a month or five weeks they will have good roots, therefore should be then taken up and potted; for when they are left longer in the full ground, they will grow very luxuriant, so will not so soon recover their removal, as those which are transplanted earlier. The plants are hardy, so may be exposed to the open air in summer; and in the winter, if they are sheltered in a common green-house, with Myrtles and other hardy exotick plants, they will live several years.

The seeds of this sort seldom come up the same year, when they are sown in spring, but those which have fallen in the autumn, have grown the following year, and so have those which have been sown at the same season.

AMETHYSTEIA. *Lin. Gen.* 32. Amethyit.

The Characters are,

The flower has one leaf, which is cut into five equal pointed segments at the brim; it hath two slender stamina, which stand under the upper lip. After the flower is past, the germen becomes four naked seeds, shut up in the empalement.

We know but one Species of this genus, viz.

AMETHYSTEIA. *Hort. Upsal.* 9. Mountain upright Amethyit.

This plant is a native of the mountains in Siberia, from when the seeds were sent to the imperial garden at Peterburgh.

It is annual, and hath an upright stalk, which rises about a foot high, and toward the top puts out two or three small lateral branches; these are garnished with small trifid leaves, sawed on their edges, and of a very dark green colour; at the extremity of the branches, the flowers are produced in small umbels; these are of a fine blue colour, as are also the upper part of the branches, and the leaves immediately under the umbel; so that although the flowers are small, yet from their colour, with those of the upper part of the stalks, the plants make a pretty appearance, during their continuance in flower. If the seeds of this plant are sown in the autumn, or are permitted to scatter, the plants will come up early the following spring, and these will flower the beginning of June; but those which are sown in the spring, will not flower till July.

When the plants come up, they will require no other care but to keep them clean from weeds, and where they are too close to thin them, for they do not thrive when transplanted, therefore the seeds should be sown where they are to remain.

AMMANNIA. *Houss. Nov. Gen.*

The Characters are,

It hath a bell-shaped empalement, divided at the brim into four slender parts. The flower hath no petals; it has four slender stamina which are inserted in the empalement. The empalement afterward becomes a round capsule with four cells, which are filled with small seeds.

The Species are,

1. AMMANNIA *foliis semiamplexicaulibus, caule tetragono.* *Hort. Cliff.* 344. *i. e.* Ammannia with a square stalk, and leaves embracing it half round.

2. AMMANNIA *foliis subpetiolatis caule ramosa.* *Lin. Sp. Pl.* 120. *i. e.* Ammannia with leaves having short foot-stalks and a branching stalk.

The first grows naturally in moist places in Jamaica, from whence Dr. Housloun sent the seeds to England.

It grows about a foot high, with an upright square stalk, and long narrow leaves set in form of a triangle, whose base half surround it. They are of a pale green, and of the consistence with those of Purslane; the stalks are also succulent, and of the same colour with those of that plant. The flowers come out in whorles round the stalks, at the joints where

the leaves adhere, in clusters: and are soon succeeded by round seed vessels, which are full of small seeds.

These plants must be raised on a hot-bed in the spring, and afterward removed to another hot-bed to bring them forward; when they have acquired strength, they should be transplanted into pots filled with rich light earth, and placed under a frame, or in a glass case or stove to ripen their seeds, for the plants are too tender to thrive in the open air in this country, unless the summer proves very warm.

The second sort grows naturally in Virginia and Carolina; this is an annual plant, which rises about a foot high, with red succulent stalks, putting out side branches, which grow opposite: the flowers are produced single from the wings on the lower part of the branches. These have no beauty, so are only preserved in botanick gardens for the sake of variety. This sort will perfect its seeds in the open air, if the plants are raised on a hot-bed in the spring, and planted in a warm border.

AMMI. Bishops-weed.

The Characters are,

It is an umbelliferous plant; the flowers are difform, each having five heart-shaped petals. They have five slender stamina, and two reflexed styles, crowned with obtuse stigmas. The germen afterward becomes a small round striated fruit, composed of two seeds.

The Species are,

1. AMMI *foliis inferioribus pinnatis lanceolatis serratis, superioribus multifidis linearibus.* *Hort. Upsal.* 59. *i. e.* Common Bishops-weed.

2. AMMI *foliorum omnium lacinulis lanceolatis.* *Guett.* 2. p. 433. *i. e.* Bishops-weed with all its leaves cut in a shape of a spear.

The first sort is annual; of this there is a variety, which is mentioned by John Baubin as a distinct species, under the title of *Ammi majus foliis plurimum incisus & nonnihil crispis*; but I have frequently had this variety arise from the seeds of the former, so I have not enumerated it as a different sort.

This plant is propagated by seeds, which should be sown in the autumn, in the place where it is to remain; and in the spring, the plants should be thinned, in the same manner as is practised for Carrots, leaving them four or five inches asunder; for they will grow large and cover the ground; after this they will require no farther care, but to keep them clean from weeds. In June they will flower, and their seeds will ripen in August, which should be gathered as it ripens, otherwise it will soon scatter. These seeds are used in medicine, so may be had in plenty with this management.

The second sort is a perennial plant, which is preserved in botanick gardens for variety, but having little beauty, is rarely admitted into other gardens. It may be propagated by seeds, which should be sown in the autumn, because those sown in the spring, seldom come up the same year. It will grow in any open situation, is very hardy, and thrives best on a moist soil.

AMMI PERENNE. See Sium.

AMOMUM. *Lin. Gen. Plant.* 2. Ginger.

The Characters are,

The flower is of one leaf, divided into four parts at the brim. In the bosom of the flower is situated an oblong thick nectarium. Under the receptacle of the flower is placed the round germen, which afterward becomes an oval three-cornered seed-vessel, opening in three parts, containing several seeds.

The Species are,

1. AMOMUM *scapo nudo spicâ ovato.* *Hort. Cliff.* 3. Ginger.

2. AMOMUM *scapo nudo spicâ oblongâ obtusâ.* *Hort. Cliff.* 3. Broad-leaved wild Ginger, called Zerumbet.

The first, which is the common Ginger, is cultivated for sale in most of the islands of America, but is a native of the East-Indies, and also of some parts of the West-Indies, where

it is found growing naturally without culture. The dried roots of this sort furnish a considerable export from the *British* colonies in *America*. These roots are of great use in the kitchen, as also in medicine; and the green roots preserved as a sweetmeat, are preferable to every other sort.

The roots of this sort are jointed, and spread in the ground; these put out many green Reed-like stalks in the spring, which rise to the height of two feet and an half, with narrow leaves. The flower-stems afterward arise by the side of these, immediately from the root; these are naked, ending with an oblong scaly spike; from each of these scales is produced a single blue flower, whose petals are but little longer than the squamose covering.

The second sort grows naturally in *India*; the roots of this are much larger than those of the first, but are jointed in the same manner. The stalks grow from three, to near four feet high, with oblong leaves placed alternately. The flower-stems arise immediately from the root, these are terminated by oblong blunt scaly heads; out of each scale is produced a single white flower, whose petals extend a considerable length beyond their scaly covering.

These sorts are tender, and require a warm stove to preserve them in this country. They are easily propagated by parting of their roots; the best time for doing this is in the spring, before they put out new shoots, for they should not be transplanted in summer when they are in full vigour, nor do they succeed so well when they are removed in autumn, because they remain long after in an inactive state, and during that time, if wet comes to the roots, it often causes them to rot. When the roots are parted, they should not be divided into small pieces, especially if they are designed to have flowers, for until the roots have spread to the side of the pots, they rarely put out flower-stems, for which reason they should not be planted in very large pots.

The pots with these roots should constantly remain plunged in the tan bed, for if they are taken out and placed on shelves in the stove, their fibres frequently shrink, which often occasions the roots to decay.

With this management these sorts have multiplied greatly with me, and the common Ginger has produced roots which have weighed five or six ounces, but the others have been near a pound weight.

AMOMUM PLINII. See Solanum.

AMORIS POMUM. See Lycopersicon.

AMORPHA. *Lin. Gen. Plant.* 768. Bastard Indigo.

The Characters are,

The flower is of the butterfly kind, having an oval concave standard, but no wings or keel; this is inserted between the two upper segments of the empalement: the germen afterward becomes a reflexed moon-shaped pod, having one cell, in which are lodged two kidney-shaped seeds.

We know but one Species of this genus, viz.

AMORPHA. *Hort. Cliff.* 353. Bastard Indigo.

This shrub grows naturally in *Carolina*, where formerly the inhabitants made a coarse sort of Indigo from the young shoots, which occasioned their giving it the title of Bastard Indigo.

It rises with many irregular stems, to the height of twelve or fourteen feet, with very long winged leaves, in shape like those of the common Acacia. At the extremity of the same year's shoots, the flowers are produced in long slender spikes, which are very small, and of a deep purple colour. After the flowers are past, the germen turns to a short pod, having two kidney-shaped seeds, but these do not ripen in *England*.

This shrub is become very common in all the gardens and nurseries near *London*, where it is propagated as a flowering shrub, for the ornament of the shrubbery. It is generally propagated by laying down of the young branches, which in one year will make good roots, and may then be taken

off and planted, either in the nursery, or the places where they are designed to remain. The plants must have a sheltered situation, otherwise their branches will be broken by the winds. As these shoots are large and soft, their upper parts are generally killed by frost in winter; but they put out shoots again in plenty below the dead part, the spring following.

AMYGDALUS. *Lin. Gen. Plant.* 545. The Almond Tree.

The Characters are,

It hath a tubulous empalement of one leaf, which is cut at the brim into five obtuse segments; the flower hath five oval obtuse concave petals, which are inserted in the empalement. After the flower is past, the germen becomes an oval compressed large fruit, with a thin tough hairy covering, having a longitudinal furrow; this opens and falls away, leaving an oval compressed nut.

The Species are,

1. AMYGDALUS foliis petiolatis serratis petalis forum emarginatis. Common manured Almond Tree.

2. AMYGDALUS foliis petiolatis marginibus crenatis, corollis calyce vix longioribus. The tender-shelled Almond, commonly called *Jordan* Almond.

3. AMYGDALUS foliis lanceolatis integerrimis, argenteis perennantibus petiolo brevioribus, i. e. Almond Tree with spear-shaped silvery leaves, which are entire, and continue all winter, and very short foot-stalks.

4. AMYGDALUS foliis petiolatis serratis basi attenuatis. Dwarf Almond with single flowers.

The first is the common Almond, which is cultivated more for the beauty of its flowers, than for its fruit. There are two varieties of this, one with sweet, and the other bitter kernels, which arise from the fruit of the same tree.

The second sort is commonly known by the title of *Jordan* Almonds; the nuts of this kind are frequently brought to *England*. These have a tender shell, and a large sweet kernel. The leaves of this tree are broader, shorter, and grow much closer than those of the common sort, and their edges are crenated. The flowers are very small, and of a pale colour, inclining to white.

The third sort was found growing near *Aleppo*, from whence the fruit was sent to the duke *D'Ayen* in *France*, who raised several of the plants in his curious garden at *St. Germain*. The leaves of this tree are silvery, and very like those of the Sea Purslane. These continue great part of the year, but the flowers are small, and like those of the second sort.

The fourth sort is very common in the nurseries about *London*, and is usually sold with other flowering shrubs to adorn gardens. This sort seldom rises more than four feet high, sending out many side branches. The roots of this are very subject to put out suckers, by which it may be increased in plenty; but if these are not annually taken away, they will starve the old plants. This shrub flowers in *April*, at which time all the young shoots are covered with flowers, which are of a Peach-blossom colour, and make a fine appearance when intermixed with shrubs of the same growth.

The common Almond is cultivated in all the nurseries, and the trees are generally planted for the beauty of its flowers. These often appear in *February*, when the spring is forward, but if frost comes after, the flowers are soon destroyed, so that their beauty is of short duration, and in those seasons there are few Almonds produced; whereas, when the trees do not flower till late in *March*, they seldom fail to bear plenty of fruit, many of which will be very sweet, and fit for the table when green, but they will not keep long.

They are propagated by inoculating a bud of these trees into a Plum, Almond, or Peach stock, in the month of *July*.

The next spring, when the buds shoot, you may train them up either for standards, or suffer them to grow for half-standards, according to your own fancy. The best season for transplanting these trees, if for dry ground, is in *October*, as soon as the leaves begin to decay; but for a wet soil, *February* is much preferable; observe always to bud upon Plum stocks, for wet ground; and Almonds or Peaches, for dry.

ALMOND, the dwarf, with double flowers. See *Perfica*.

ANACAMPSEROS. See *Sedum*.

ANACARDIUM. *Lin. Gen. Plant.* 467. The Cashew Nut, or Acajou.

The Characters are,

The flower is of one leaf, and cut into five parts at the top; it hath ten slender stamina. In the center is placed a round germen, with an awl-shaped style. The germen afterward becomes a large oval fleshy fruit, having a large kidney-shaped nut growing to its apex.

We have but one Species of this genus, viz.

ANACARDIUM. *Hort. Cliff.* 161. The Cashew, or Cajou.

This grows to a considerable height in its native country, which is the *West-Indies*, but in *England* the plants are with great difficulty preserved; though by their first shoot from the seeds, they appear so strong and vigorous, as to promise a much greater progress, than they are ever seen to make here.

They are easily raised from the nuts, which are annually brought from *America* in great plenty; each of these should be planted in a small pot filled with light sandy earth, and plunged into a good hot-bed of tanners bark, being careful to prevent their having wet till the plants come up, for the nuts frequently rot with moisture. The reason for my advising the nuts to be each put in a separate pot, is, because the plants seldom live when they are transplanted. If the nuts are fresh, the plants will come up in about a month after planting; and, in two months more, the plants will be four or five inches high, with large leaves; and from this quick growth, many persons have been deceived by supposing them hardy, and that they would continue the like progress, whereas they seldom advance much farther the same year.

The plants must be constantly kept in the stove, for they are too tender to live abroad in *England*, in the warmest season of the year, nor will they thrive in a common greenhouse in summer. As these plants abound with a milky acrid juice, so they should have but little water, even in summer; and in winter, if they are sparingly watered once in a month, it will be sufficient, for their roots are tender and soon perish with moisture.

The pulpy fruit, to whose apex this nut grows, is as large as an orange, and is full of an acid juice, which is frequently mixed in the making of punch in *America*. Many of these fruit have been brought to *England*, in casks of rum for the same purpose.

The nut is of the size and shape of a hare's kidney, but is much larger at the end which is next the fruit, than at the other. The shell contains an inflammable oil, which is very caustick; this will raise blisters on the skin, and has often been very troublesome to those who have incautiously put the nuts into their mouths to break the shell.

The milky juice of this tree will stain linen of a deep black, which cannot be washed out again; but whether this has the same property with that of the eastern *Anacardium*, has not yet been fully experimented, for the inspissated juice of that tree is the best sort of black, which is used for staining of black in *China* and *Japan*.

ANACYCLUS. Is a sort of Camomile of little beauty and no use, so is seldom kept in any but gardens of botany, and not worthy to be mentioned here.

ANAGALLIS. Pimpernel.

The Characters are,

The flower hath an empalement which is cut into five sharp segments. The flower is of one leaf spread open, and cut into five parts. The germen afterward becomes a globular vessel with one cell, opening horizontally, in which are lodged several angular seeds.

The Species are,

1. ANAGALLIS foliis indivisis caule procumbente. *Lin. Gen. Plant.* 148. Common Pimpernel with a red flower.

2. ANAGALLIS foliis indivisis glaucis caule procumbente flore cœruleo. Female Pimpernel with a blue flower.

3. ANAGALLIS foliis indivisis caule erecto. *Lin. Sp. Plant.* 148. Narrow-leaved Pimpernel with a blue flower.

4. ANAGALLIS foliis cordatis amplexicaulibus, caulibus compressis. *Lin. Sp. Plant.* 149. Broad-leaved Spanish Pimpernel with a blue flower.

The first sort is very common in corn fields, and other cultivated places, in most parts of *England*. The second sort is sometimes found wild in the fields, but is less common than the first in *England*. There is a variety of this with a deeper blue flower, whose seeds I received from *Nice*, and this hath retained its colour for three years, during which time I have sown it in the *Chelsea* garden.

These are all annual plants, except the third sort, which arise from seeds, and, if suffered to remain till their seeds scatter, will become weeds in the place; so that they are never cultivated, except in botanick gardens for variety. The first and second sorts are directed by the *College of Physicians* for medicinal use.

ANAGYRIS. Stinking Bean-trefoil.

The Characters are,

The flower is of the butterfly kind, the standard is heart-shaped, and much longer than the empalement; the wings are oblong, plain, and longer than the standard; as is also the keel. The germen afterward becomes a large oblong pod, in which are lodged several kidney-shaped seeds.

We have but one Species in *England*, viz.

ANAGYRIS foliis ovatis floribus lateralibus. Stinking Bean-trefoil with oval leaves, and flowers proceeding from the wings of the stalks.

This sort grows wild in the south of *France*, as also in *Spain* and *Italy*. It is a shrub which usually rises to the height of eight or ten feet, and produces its flowers in *April* and *May*, which are of a bright yellow colour, growing in spikes, somewhat like those of the *Laburnum*.

It may be propagated by laying down their tender branches in the spring, observing in dry weather to supply them with water; which if duly performed, the layers will have taken root by the following spring, when they should be cut off from the old plants, a little time before they begin to put out their leaves, and planted in a warm situation; for if they are too much exposed to cold winds, they will be in danger of being destroyed in a hard winter. This method of propagating these plants, is to supply their defect in not producing ripe seeds in this country; for the plants which are produced from seeds, will be much handsomer, and will rise to a much greater height.

If you propagate this plant from seeds, you should sow them in pots filled with light fresh earth, toward the end of *March*, and plunge the pots into a gentle hot-bed. If the seeds are good, the plants will appear in a month after they are sown; as the plants advance they should be inured to the open air, that they may be hardened before the following winter. In the autumn the pots should be placed in a hot-bed frame, to screen the plants from hard frosts, and the following spring they should be each transplanted into a separate small pot, and placed in a sheltered situation in summer, and the autumn following removed again into a frame,

frame, to shelter them in winter. The second spring after the plants come up, some of them may be shaken out of the pots, and planted in a border near a south wall, where they may remain for good.

ANANAS, the Pine-apple.

The Characters are,

The flower consists of three oval petals; these are produced from the protuberances of the pyramidal fruit. The germen is situated below the flower, which afterwards becomes a cell, in which is lodged several angular seeds.

The Varieties of this are,

1. ANANAS aculeatus, fructu ovato, carne albida. Plum. Oval-shaped Pine-apple, with a whitish flesh.

2. ANANAS aculeatus, fructu pyramidato, carne aurea. Plum. Pyramidal Pine-apple, with a yellowish flesh, called the Sugar-loaf Pine.

3. ANANAS folio vix serrato. Boerb. Ind. Alt. 2. 83. Pine-apple with smooth leaves.

4. ANANAS lucidè virens, folio vix serrato. Hort. Elth. Pine-apple with shining green leaves, and scarce any spines on their edges.

5. ANANAS fructu pyramidato olivæ colore, intus aureo. Pyramidal olive-coloured Pine-apple, with a yellow flesh.

6. ANANAS aculeatus, fructu pyramidato ex viridi flavescente. The green Pine-apple.

There are some other varieties of this fruit, which may have been obtained from seeds; and I doubt not but if the seeds were sown frequently, in the countries where they are in plenty, there may be as great variety of these fruit, as there are of apples or pears in Europe. And this I have found true by some trials which I have made by sowing of the seeds, which have always produced a variety of sorts from those of the same fruit.

The first sort is the most common in Europe; but the second sort is much preferable to it, the fruit of this being larger, and much better flavoured: the juice of this sort is not so astringent as that of the first, so that this fruit may be eaten in greater quantity, with less danger. This sort frequently produces suckers, immediately under the fruit, whereby it may be increased much faster than the common sort; so that in a few years, it may be the most common sort in England.

The third sort is preserved by some curious persons for the sake of variety, but the fruit is not worth any thing.

The sort with very smooth grass-green leaves, was raised from seeds taken out of a rotten fruit, which came from the West-Indies to the late Henry Heathcote, Esq; from whom I received one plant, which hath produced large fruit: this, I am told, is what the people of America call the King Pine. I have since raised some plants of this kind from seeds, which were brought me from Jamaica.

The plants are propagated by planting the crowns which grow on the fruit, or the suckers which are produced either from the sides of the plants, or under the fruit, both which I have found to be equally good; although by some persons the crown is thought preferable to the suckers, as supposing it will produce fruit sooner than the suckers, which is certainly a mistake; for by constant experience I find the suckers (if equally strong) will fruit as soon, and produce as large fruit as the crowns, if not better.

The suckers and crowns must be laid to dry in a warm place for four or five days, or more (according to the moisture of the part which adhered to the old plant or fruit); for if they are immediately planted, they will rot. The certain rule of judging when they are fit to plant, is by observing if the bottom is healed over, and become hard; for if the suckers are drawn off carefully from the old plants, they will have a hard skin over the lower part, so need not lie so long as the crowns, or those whose bottoms are moist. But when-

ever a crown is taken from the fruit, or the suckers from old plants, they should be immediately divested of their bottom leaves, so high as to allow depth for their planting; so that they may be thoroughly dry and healed in every part, lest when they receive heat and moisture, they should perish, which often happens when this method is not observed. If these suckers or crowns are taken off late in the autumn, or during the winter, or early in the spring, they should be laid in a dry place in the stove, for a fortnight or three weeks before they are planted, but in the summer season they will be fit for planting in a week at farthest.

As to the earth in which these should be planted, if you have a rich good kitchen garden mould, not too heavy, so as to detain the moisture too long, nor over light and sandy, it will be very proper for them without any mixture: but where this is wanting, you should procure some fresh earth from a good pasture; which should be mixed with about a third part of rotten neats dung, or the dung of an old melon or cucumber bed, which is well consumed. These should be mixed six or eight months at least before they are used; but if it be a year, it will be the better; and should be often turned, that their parts may be the better united, as also the clods well broken. This earth should not be screened very fine, for if you only clear it of the great stones, it will be better for the plants than when it is made too fine. You should always avoid mixing any sand with the earth, unless it be extremely stiff, and then it will be necessary to have it mixed at least six months or a year before it is used; and it must be frequently turned, that the sand may be incorporated in the earth, so as to divide its parts: but you should not put more than a sixth part of sand, for too much sand is very injurious to these plants.

In the summer season, when the weather is warm, these plants must be frequently watered, but you should not give them large quantities at a time: you must also be very careful, that the moisture is not detained in the pots, by the holes being stopped, for that will soon destroy the plants. If the season is warm, they should be watered twice a week; but in a cool season, once a week will be often enough: and during the summer season, you should once a week water them gently all over their leaves, which will wash the filth from off them, and thereby greatly promote the growth of the plants.

There are some persons who frequently shift these plants from pot to pot, but this is by no means to be practised by those who propose to have large well flavoured fruit; for unless the pots be filled with the roots, by the time the plants begin to shew their fruit, they commonly produce small fruit, which have generally large crowns on them, therefore the plants will not require to be new potted oftener than twice in a season: the first time should be about the end of April, when the suckers and crowns of the former year's fruit (which remained all the winter in those pots in which they were first planted) should be shifted into larger pots, *i. e.* those which were in halfpenny, or three-farthing pots, should be put into penny, or at most three halfpenny pots, according to the size of the plants; for you must be very careful not to overpot them, nothing being more prejudicial to these plants. The second time for shifting of them is in the beginning of August, when you should shift those plants which are of a proper size for fruiting the following spring, into two-penny pots, which are full large enough for any of these plants. At each of these times of shifting the plants, the bark-bed should be stirred up, and some new bark added, to raise the bed up to the height it was at first made; and when the pots are plunged again into the bark-bed, the plants should be watered gently all over their leaves, to wash off the filth, and to settle the earth to the roots of the plants. If the bark-bed be well stirred,

stirred,

stirred, and a quantity of good fresh bark added to the bed, at this latter shifting it will be of great service to the plants; for they may remain in the same tan until the beginning of *November*, or sometimes later, according to the mildness of the season, and will require but little fire before that time. During the winter season these plants will not require to be watered oftener than once a week, according as you find the earth in the pots to dry: nor should you give them too much at each time, for it is much better to give them a little water often, than to over-water them.

You must observe never to shift those plants which show their fruit, into other pots; for if they are removed after the fruit appears, it will stop the growth, and thereby cause the fruit to be smaller, and retard its ripening, so that many times it will be *October* or *November* before the fruit is ripe; therefore you should be very careful to keep the plants in a vigorous growing state, from the first appearance of the fruit, because upon this depends the goodness of the size of the fruit; for if they receive a check after this, the fruit is generally small and ill tasted.

When you have cut off the fruit from the plants, whose kind you are desirous to propagate, you should trim the leaves, and plunge the pots again into a moderate hot-bed, observing to refresh them frequently with water, which will cause them to put out suckers in plenty; so that a person may be soon supplied with plants enough of any of the kinds, who will but observe to keep the plants in health.

There is not any thing which can happen to these plants of a more dangerous nature, than to have them attacked by small white insects, which appear at first like a white mildew, but soon after have the appearance of lice: these attack both root and leaves at the same time, and if they are not soon destroyed, will spread over a whole stove in a short time; and in a few weeks will entirely stop the growth of the plants, by sucking out the nutritious juice, so that the leaves will appear yellow and sickly, and have generally a great number of yellow transparent spots all over them. These insects, after they are fully grown, appear like bugs, and adhere so closely to the leaves, as not to be easily washed off, and seem to have no local motion. They were originally brought from *America* upon the plants which were imported from thence, and I believe they are the same insects which have destroyed the sugar canes of late in some of the *Leeward Islands*; for upon some sugar canes which were sent me from *Barbadoes* there were great numbers of the same insects. Since they have been in *England*, they have spread greatly in such stoves, where there has not been more than ordinary care taken to destroy them. They have also attacked the Orange trees in many gardens near *London*, and have done them incredible damage; but I do not find they will endure the cold of our climate in winter, so that they are never found on such plants as live in the open air. The only method I have yet been able to discover for destroying these insects, is by washing the leaves, branches, and stems, of such plants as they attack, frequently with water, in which there has been a strong infusion of tobacco stalks, which I find will destroy the insects, and not prejudice the plants. But this method cannot be practised on the *Ananas* plants, because the insects will fasten themselves so low between the leaves, that it is impossible to come at them with a sponge to wash them off; so that if all those which appear to sight are cleared off, they will soon be succeeded by a fresh supply from below, and the roots will be also equally infested at the same time. Therefore, whenever these insects appear on the plants, the safest method will be, to take the plants out of the pots, and clear the earth from the roots; then prepare a large tub, which should be filled with water, in which there has been a strong infusion of tobacco stalks; into this tub you should put the

plants, placing some sticks cross the tub, to keep the plants immersed in water. In this water they should remain twenty-four hours; then take them out, and with a sponge wash off all the insects from the leaves and roots, which may be easily effected when the insects are killed by infusion; then cut off all the small fibres of the roots, and dip the plants into a tub of fair water, washing them therein, which is the most effectual way to clear them from the insects. After which you should pot them in fresh earth, and having stirred up the bark-bed, and added some new tan to give a fresh heat to the bed, the pots should be plunged again, observing to water them all over the leaves (as was before directed) and this should be repeated once a week during the summer season; for I observe these insects always multiply much faster where the plants are kept dry, than in such places where the plants are sometimes sprinkled over with water, and kept in a growing state.

As these insects are frequently brought over from *America* on the *Ananas* plants which come from thence, those persons who procure their plants from thence, should look carefully over them when they receive them, to see they have none of these insects on them; for if they have, they will soon be propagated over all the plants in the stove where these are placed: therefore, whenever they are observed, the plants should be soaked (as before directed) before they are planted into pots.

The stoves which are erected for preserving of these plants are built in different ways, according to the fancy of the contriver. Some persons build them with upright glasses in front, about four feet high, and sloping glasses over these, which rise about six feet high, so that there is just height enough for persons to walk upright on the back-side of the bark-bed. Others make but one slope of glasses, from the top of the stove down to the plate, which lies about six or eight inches above the bark pit, in the front of the stove; so that in this stove, there is no walk made in the front between the bark pit and the glasses; but the inconveniency of watering the plants, as also of coming near those plants which are placed in the front of the stove to clean them, has, in some measure, brought them into disesteem, so that few persons now build them, though the expence is much less than of the other kind of stoves; but of both these stoves, the figures and descriptions which are hereafter exhibited under the article of *STOVE*, will be sufficient for any person to build either of the sorts. One of these stoves about twenty-five feet long in the clear, with the pit for the tan reaching from end to end, and six feet and an half wide, will contain about an hundred plants; so that whoever is desirous to have this fruit, may easily proportion their stove to the quantity of fruit which they are willing to have.

But it will be also necessary to have a bark pit under a deep frame, in order to raise the young plants in summer; for in this bed you should plunge the suckers, when they are taken from the old plants, as also the crowns which come from the fruit, so that this frame will be as a nursery to raise the young plants to supply the stove: but these plants should not remain in these frames longer than till the beginning of *November*, unless the frame is built with brick-work with flues in it to warm the air (in the manner hereafter described and figured), which are very useful, as nurseries, to keep the young plants till they are of a proper size to produce fruit; and the air in this frame may be kept either warmer or cooler than the stove, according as the plants may require, so that the stove may be every autumn filled only with bearing plants, whereby a much greater quantity of fruit may be annually produced, than can be where young and old plants must be crowded into

into the same stove: but where there are no conveniencies of this kind, the young plants, about the middle or latter end of *October*, must be removed into the stove, and being small, may be crowded in among the larger plants; for as they will not grow much during the winter season, so they may be placed very close together. The end of *March*, where there is no nursery for the young plants, they must be removed out into the hot bed again, which should be prepared a fortnight before, that the tan may have acquired a proper heat: but you should be careful that the tan be not too hot, for that might scald the fibres of the plants, if they are suddenly plunged therein. Therefore if you find the bark too hot, you should not plunge the pots above two or three inches into the tan, letting them remain so until the heat of the tan is a little abated, when you should plunge the pots down to their rims in the bed. If the nights should continue cold after these plants are removed into the bed, you must carefully cover the glasses with mats; otherwise by coming out of a warm stove, they may receive a sudden check, which will greatly retard their growth, which must be carefully avoided; because the sooner the plants are set growing in the spring, the more time they will have to gain strength, in order to produce large fruit the following season.

You should not plunge the pots too close together in this frame, but allow them a proper distance, that the lower part of the plants may increase in bulk, for it is on this that the magnitude of the fruit depends; because when the plants are placed too close, they draw up very tall, but do not obtain strength; so that when they are taken out of the bed, the leaves are not able to support themselves; but all the outward long leaves will fall down, leaving the smaller middle leaves naked, and this sometimes will cause them to rot in the centre. You must also observe, when the sun is very warm, to raise the glasses of the hot-bed in the heat of the day with props, in order to let out the steam of the bed, and to admit fresh air; for one neglect of this kind, in a very hot day, may destroy all the plants, or at least so scald them, that they will not get over it in many months. It will be also very proper, in extreme hot weather, to shade the glasses in the middle of the day with mats; for the glasses, lying so near to the leaves of the plants, will occasion a prodigious heat at such times.

There are some persons who regulate the heat of their stoves by thermometers in summer, but at that season this is unnecessary, for the outward air in hot weather is frequently greater than the Ananas heat marked on the thermometers, so that the heat of the stoves at that season will be much greater. The use of the thermometer is only in winter, during the time the fires are continued, by which it is easy to judge when to increase or diminish the fires; for at that season, the stoves should not be kept to a greater warmth than five or six divisions above Ananas, nor suffered to be more than as many divisions below it. When the plants are placed into the tan for the winter season (which should be done about the middle of *October*), the tan bed should be renewed, adding two thirds of new tan, to one third of the old. If this be well mixed, and the new tan is good, the bed will maintain a proper degree of warmth till *February*, at which time it will be proper to stir up the bed, and add a load or two of new tan, so as to raise the bed as much as it sunk since the autumn; this will give a fresh heat to the bed, and keep the plants growing; and, as the fruit will now begin to appear, it will be absolutely necessary to keep the plants in a growing state, otherwise the fruit will not be large; for if they receive any check at this time, it will greatly injure them.

In *April* it will be proper to stir up the tan again, and if the bed has sunk since the last stirring, it will be proper to

add some fresh tan to it; this will renew the warmth of the bed, and forward the fruit. And if the tan bed is constantly kept in a good temper, and a sufficient quantity of air admitted every day to the plants, they will succeed much better than in a cool bed kept too close.

Those plants which shew their fruit early in *February*, will ripen about *June*; some sorts are at least a month or five weeks longer in ripening their fruit than others, from the time of the appearance of the fruit: but the season in which the fruit is in greatest perfection is from the beginning of *June* to the end of *September*; though in *March*, *April*, and *October*, I have frequently eaten this fruit in pretty good perfection; but then the plants have been in perfect health, otherwise they are seldom well flavoured.

The method of judging when the fruit is ripe, is by the smell, and from observation; for as the several sorts differ from each other in the colour of their fruit, that will not be any direction when to cut them; for should they remain so long as to become soft to the touch before they are cut, they become flat and dead, as they do also when they are cut long before they are eaten: therefore the surest way to have this fruit in perfection, is to cut it the same day it is eaten: but it must be cut early in the morning, before the sun has heated the fruit, otherwise it will be hot, observing to cut the stalk as long to the fruit as possible, and lay it in a cool, but dry place, preserving the stalk and crown unto it, until it is eaten.

That sort with green fruit, if suffered to ripen well, is of an olive colour; but there are some persons who cut them before they are ripe, when they are not fit to be eaten, for no other reason, but to have them green: and although many persons have much recommended this sort for its excellent flavour, yet I think the sugar loaf sort is to be preferred to it.

ANAPODOPHYLLON. See Podophyllum.

ANASTATICA. *Lin. Gen. Plant.* 175. (Rose of *Jericho*.)

The Characters are,

The flowers hath four roundish petals placed in form of a cross. The seed vessel in this is blunt-pointed, bordered, and crowned, and the valves open oblique to the style.

We know but one Species of this genus, viz.

ANASTATICA. *Hort. Cliff.* 328. Rose of *Jericho*.

This plant grows naturally on the sands near the borders of the *Red Sea*, and in many parts of *Syria*. It is a low annual plant, dividing into many irregular woody branches near the root; at each joint is placed a single, oblong, hoary loaf, and at the same places come out small single flowers of a whitish green colour, composed of four small leaves, placed in form of a cross, like the other plants of this class. These are succeeded by short wrinkled pods, having four small horns; these open into two cells, in each of which is lodged a single brown seed.

It hath had the epithet of *Rosa Mariae* given to it by the monks, who have superstitiously supposed that the flowers open on the night that our Saviour was born. But the truth is, that the dry woody plant being set for some time in water, will dilate and open so as to disclose the seed vessels and seeds. This I have seen done when the plants have been many years gathered, so that there are several curious persons who preserve them in their repositories of curiosities, for the singularity of this property.

This plant is propagated by seeds, which should be sown the beginning of *April*, on a border of light sandy earth, where it is designed to remain, for it will not bear transplanting. When the plants come up, they should be thinned, leaving them about six inches distant from each other, and observe to keep them clean from weeds, this is all the care they require. If the season proves favourable, the

plants

plants will flower in *August*, but unless the autumn proves warm and dry, they will not ripen their seeds in *England*; nor could I rarely procure seeds from those plants which were raised in autumn, for if much rain happens when the plants are in flower, they never perfect any seeds.

ANCHUSA. *Lin. Gen.* 167.

The Characters are,

The flower is of one leaf, having a cylindrical tube; at the brim it is cut into five obtuse segments, which spread open. The germen afterward becomes four oblong blunt seeds shut up in the empalement.

The Species are,

1. ANCHUSA foliis lanceolatis birsutis, floribus capitatis axillaribus pedunculis longissimis. The greater Garden Bugloss.

2. ANCHUSA racemis subnudis conjugatis. *Prod. Leyd.* 408. Perennial wild Borage with a Carmine flower.

3. ANCHUSA strigosa foliis linearibus dentatis pedicellis bractea minoribus calycibus fructiferis inflatis. *Læf. Lin. Sp. Plant.* 133. Portugal Bugloss with a waving Viper's Bugloss leaf.

4. ANCHUSA ramis floribusque alternis axillaribus bracteis ovatis. *Lin. Sp. Plant.* 133. Eastern Bugloss with a yellow flower.

5. ANCHUSA floribus sparsis caule glabro. *Lin. Sp. Plant.* 133. Small yellow Alkanet of *Virginia*, called by the inhabitants *Puccoon*.

6. ANCHUSA pedunculis diphyllis capitatis. *Lin. Sp. Plant.* 134. Broad-leaved Ever green Borage.

7. ANCHUSA foliis lanceolatis verrucosis semiamplexicaulis, floribus capitatis, caule procumbente. Warty Bugloss of *Crete*.

8. ANCHUSA foliis lanceolatis spicis imbricatis secundis. *Hort. Cliff.* 46. Greater *Candia* Bugloss with a purplish blue flower.

9. ANCHUSA foliis longis birsutis, floribus capitatis reflexis, pedunculis longissimis. Wild *Cretan* Borage with an azure flower.

The first sort is the Bugloss, whose flowers are ordered to be used in medicine.

The roots of this sort seldom continue longer than two years, especially in good ground, for they are subject to rot in winter, unless when they happen to grow in rubbish, or out of an old wall, where they will live three or four years; for in such places the plants are stunted in their growth, so their branches are firmer and not so full of juice as those which grow in better soil. The plants may be easily propagated by seeds, which may be sown either in the spring or autumn, upon a bed of light sandy earth; and when the plants are strong enough to remove, they should be planted into beds at two feet distance, observing, if the season proves dry, to water them till they have taken root, after which time they will require no farther care but to keep them clean from weeds. The plants which come up in the autumn, will flower the following *June*, and ripen their seeds in *August*; but those which are sown in the spring, do not often flower the same year, or if they do, it is late in the season, so will not ripen their seeds. If the seeds of this plant are permitted to scatter, the plants will rise in plenty, which may be managed in the manner before directed.

The second sort grows to the height of two feet when cultivated in gardens, but in the places where it grows wild, is rarely more than a foot and an half high. The leaves of this are narrow, and less hairy than those of the first; the spikes of flowers come out double, and have no leaves about them; the flowers are small, and of a red colour. The roots will continue two years in poor land.

The third sort is a biennial plant, which perishes soon after the seeds are ripe. This grows two feet high, and sends out many lateral branches. The flowers are of a bright blue colour, and grow in an imbricated spike; and after these fall, the empalement turns to a swollen vessel inclosing the seeds.

The fourth sort is a perennial plant, with long trailing branches which lie on the ground. The flowers are yellow, and about the size of the common Bugloss; and there is a succession of these on the same plants great part of the year. This, though a native of the *Levant*, is hardy enough to live in the open air in *England*, if it hath a dry sandy soil. It may be propagated by seeds in the same manner as the first sort, and if the seeds are permitted to scatter, the plants will rise without care, and will continue several years.

The fifth sort is a native of *North America*, where it grows naturally in the woods, and being an early plant, generally flowers before the new leaves come out on the trees; so that in some of the woods, where this plant abounds, the surface of the ground seems covered with its bright yellow flowers. It is known in that country by the title of *Puccoon*. It is a perennial plant, which seldom rises a foot high in good ground, but not above half that height, where the soil is poor; the flowers grow in loose spikes, upon a smooth stalk. This is propagated by seeds, which if sown in the spring, seldom grow the first year.

The sixth sort is a very hardy perennial plant, with weak trailing branches; the flowers are blue, and come out between the leaves on the spike, like the fourth sort; the plants frequently grow out of the joints of old walls, in those places where any of the plants have been near; for when the seeds are permitted to scatter, there will be an abundant supply of the plants. These flower great part of the year.

The seventh sort is a low trailing annual plant, whose branches seldom extend more than six inches. The flowers are small, of a bright blue colour, and are collected into small bunches at the extremity of the branches. The plants perish soon after their seeds are ripe, which if permitted to scatter, the plants will come up better than when they are sown.

The eighth sort rises near as high as the first, to which it bears great resemblance in its leaves and branches; but the flowers grow on long spikes coming out imbricatum, like the tiles on a house, in which it differs from that. It grows naturally in the *Levant*, but is equally hardy with the first species, and may be cultivated in the same manner.

The ninth sort is a perennial plant, with broad rough leaves, like those of the sixth; the branches grow more erect, and the flowers which are of a bright azure colour, are collected into spikes, coming out singly from between the leaves. This is a hardy plant, and may be propagated in the same manner as the other sorts.

ANCHUSA RADICE RUBRA. See *Lithospermum*.

ANDRACHNE. Bastard Orpine.

The Characters are,

There are male and female flowers on the same plant. The male flower hath a five-leaved empalement. The flower has five slender petals. It hath five slender stamina. The female flowers come out from the wings of the stalk near the male. These have a five-leaved empalement, but no petals; it has three slender styles which are inserted in the rudiment, and a globular capsule having three cells, in each of which are lodged two triangular obtuse seeds.

We have but one Species of this genus, viz.

ANDRACHNE procumbens herbacea. *Lin. Sp. Plant.* 1014. Bastard Orpine with trailing branches and a white flower.

This is a low plant, whose branches trail upon the ground. The leaves are small, of an oval shape, smooth, and of a sea-green colour. It is found wild in some parts of *Italy*, and in the *Archipelago*; and being a plant of no great beauty, it is seldom cultivated but in botanick gardens for variety. If the seeds of this plant are sown on a bed of common earth in the autumn, soon after they are ripe, the plants

plants will come up the spring following, and produce flowers and seeds; but if it is sown in the spring, the seeds will often remain in the ground until the next year, before they come up. It should be sown where it is designed to remain; and will require no other culture, but to keep the plants clear from weeds. It should have a light dry soil and a warm situation; this seldom continues longer than two years.

ANDROMEDA. *Lin. Gen. Plant.* 485. We have no *English* name for this plant.

The *Characters* are,

The empalement of the flower is cut into five small acute segments. The flower is of one leaf, is oval and bell-shaped, and divided into five parts at the brim, which are reflexed. It hath ten stamina. The germen afterward turns to a round pentagonal vessel having five cells, which are filled with small round seeds.

The *Species* are,

1. ANDROMEDA *pedunculis aggregatis, corollis ovatis, foliis alternis lanceolatis revolutis.* *Lin. Sp. Plant.* 393. *i. e.* Andromeda with aggregate foot-stalks, oval petals, and spear-shaped leaves growing alternately.

2. ANDROMEDA *pedunculis aggregatis corollis cylindricis foliis alternis ovatis integerrimis.* *Lin. Sp. Plant.* 393. Andromeda with aggregate foot-stalks, cylindrical flowers, and oval entire leaves placed alternately.

3. ANDROMEDA *racemis fecundis nudis paniculatis, corollis subcylindricis foliis alternis oblongis crenulatis.* *Lin. Sp. Pl.* 394. Andromeda with naked fruitful loose spikes, cylindrical flowers, and oblong crenated leaves placed alternately.

4. ANDROMEDA *racemis fecundis nudis, corollis rotundo-ovatis.* *Lin. Sp. Plant.* 394. Andromeda with naked fruitful spikes, and oval roundish flowers; commonly called Sorrel Tree in *Carolina*.

5. ANDROMEDA *racemis fecundis foliaceis corollis subcylindricis, foliis alternis lanceolatis obtusis punctatis.* *Lin. Sp. Pl.* 394. Andromeda with leafy fruitful spikes, cylindrical flowers, and obtuse spear-shaped leaves, with punctures placed alternately.

The first sort is a low plant which grows naturally on bogs in the northern countries, but is with difficulty preserved in gardens; and having little beauty, is seldom cultivated except in botanick gardens. I received the seeds from *Petersburgh*, which came up in the *Chelsea* garden, but did not continue more than one year.

The second sort grows naturally in *North America*: this is a low shrub, which sends out many woody stalks from the root, which are garnished with oval leaves placed alternately; the flowers are collected in small bunches: these are shaped like those of the Strawberry tree, and are of an herbaceous colour. They appear in *June* and *July*.

The third sort is also a native of *North America*. This shrub grows about four feet high, sending out several branches, which are clothed with oblong leaves placed alternately; the flowers grow in loose spikes from the ends of the branches; these are of the pitcher-shape, like those of the *Arbutus*, but are a little longer. They appear in *July*.

The fourth sort grows naturally in *Virginia* and *Carolina*; in the latter it is much larger than in the former, the climate being warmer; so many of the trees and shrubs grow to a much greater height there. In *Virginia*, this is a shrub growing ten or twelve feet high, but in *Carolina* it rises twenty feet. The flowers grow in long naked spikes, coming out from the sides of the branches, which are of an herbaceous colour, and are ranged on one side of the stalk; they are oval, and shaped like a pitcher.

The fifth sort grows naturally in *Siberia*, and also in *North America*; it is a low shrub which grows on mossy land, so is very difficult to keep in gardens. The leaves are shaped

like those of the Box tree, and are of the like consistence, having several small punctures on them; the flowers grow in short spikes from the extremity of the branches: these are produced single between two leaves, they are white, and of a cylindrical pitcher-shape.

All the sorts, except the fourth, are very hardy plants, which delight in moist ground; they increase by their creeping roots, which put up suckers at a distance, and may be taken off with roots, and transplanted where they are designed to remain, for they do not bear to be often removed.

The fourth sort requires to be sheltered from hard frost in winter, but in the summer should be frequently watered. It is a difficult plant to keep in gardens, as it grows naturally on boggy places, and requires a greater heat than that of this climate. It may be propagated by seeds, which should be procured from *America*, where it is known by the name of Sorrel tree.

ANDROSACE. We have no *English* name for this plant.

The *Characters* are,

The flowers grow in an umbel set in an involucre; the flower is of one leaf, having an oval tube, inclosed by the empalement, and is divided into five parts. It hath five small stamina within the tube; the empalement afterward becomes a round capsule of one cell, which is full of round seeds.

The *Species* are,

1. ANDROSACE *perianthiis maximis.* *Hort. Upsal.* 36. Common broad-leaved annual Androsace.

2. ANDROSACE *foliis lanceolatis dentatis glabris perianthiis angulatis corollâ brevioribus.* *Flor. Suec.* 160. Spring Chickweed with heads like Androsace.

3. ANDROSACE *foliis pilosis perianthiis hirsutis.* *Lin. Sp. Plant.* 142. Hairy Housleek of the *Alps* with a milk white flower.

The first sort grows naturally in *Austria* and *Bohemia* amongst the corn: this hath broad leaves which spread near the ground, from the center of these the foot-stalks arise, which are terminated by the umbel of flowers, like those of the *Auricula*; under the umbel of flowers is a large empalement, which is permanent; the flowers are composed of five small white petals; these appear in *April* and *May*, and the seeds ripen in *June*, and the plants soon after perish.

The other sorts are much smaller than this, some of them seldom growing more than three inches high, and have very small flowers, so make little appearance. They grow naturally on the *Alps* and *Helvetian* mountains, as also in *Siberia*, from whence I have received the seeds of three or four species. These are only preserved in botanick gardens for the sake of variety, and all the sorts except the first should have a shady situation.

The seeds of these sorts should be sown soon after they are ripe, otherwise they seldom grow the same year. Their seeds are ripe the end of *May*; which, if permitted to scatter, will come up, and often succeed better than those which are sown.

ANDROSÆMUM. See *Hypericum*.

ANDRYALA. *Lin. Gen. Plant.* 820. Downy Sowthistle.

The *Characters* are,

It hath a short round hairy empalement; the flowers are composed of many hermaphrodite flowers, which are uniform, and are of one leaf, stretched out like a tongue on one side. The germen is situated at the bottom of each floret. The germen afterward becomes a single oval seed, crowned with down.

The *Species* are,

1. ANDRYALA *foliis integris.* *Guett. Hort. Upsal.* 240. Downy Sowthistle with whole leaves.

2. ANDRYALA *foliis dentato-basistis.* *Lin. Sp. Pl.* 808. Downy Sowthistle with indented spear-shaped leaves.

The first is an annual plant, which grows naturally in the south of *France*, *Spain*, and *Italy*, and is preserved in botanick gardens for the sake of variety. This grows one foot and an half high, with woolly branching stalks. The flowers are produced in small clusters at the top of the stalks, which are yellow, and like those of the Sowthistle, so do not make any great appearance. It is easily raised by seeds, which should be sown in the spring, in the place where the plants are to remain, and will require no other culture but to thin them where they are too close, and keep them clean from weeds. It flowers in *July*, and the seeds ripen in *September*.

The second is a perennial plant, which grows naturally in *Spain*, from whence I received the seeds, as I have also from the *Cape of Good Hope*. The leaves of this plant are extremely white, and are much indented on their edges; the flower-stalks grow about a foot high, having small clusters of yellow flowers, which appear in *July*; the seeds sometimes ripen in *England*, but not every year. They love a light dry soil, in which they will live in the open air in this country.

ANEMONE. Wind-flower.

The Characters are,

The flower is naked having no empalement, and consists of two or three orders of leaves or petals, which are oblong, and disposed in three series over each other. It hath many germen collected into a head, which afterward become so many seeds inclosed with a down which adhere to the foot-stalk, and form an obtuse cone.

The Species are,

1. ANEMONE *pedunculo nudo seminibus subrotundis hirsutis*. *Lin. Sp. Pl.* 540. Wild Anemone with a large white flower.
2. ANEMONE *seminibus acutis foliolis incisus caule unifloro*. *Hort. Cliff.* 224. Wild or Wood Anemone with a large flower.
3. ANEMONE *seminibus acutis foliolis incisus petalis lanceolatis numerosis*. *Lin. Sp. Plant.* 541. Wood Anemone with a blue flower.
4. ANEMONE *pedunculis alternis longissimis fructibus cylindricis seminibus hirsutis*. *Lin. Sp. Plant.* 540. Small white flowering *Virginia Anemone*.
5. ANEMONE *foliis radicalibus ternato-decompositis, involucri foliis*. *Lin. Sp. Plant.* 539. Narrow-leaved Anemone with a single flower.
6. ANEMONE *foliis digitatis*. *Lin. Sp. Plant.* 540. Broad-leaved Garden Anemone.

The first sort grows naturally in many parts of *Germany*; this approaches near to our wood Anemone, but the seeds of it are round and hairy; the flower is large and white, but having little beauty, is seldom planted in gardens.

The second sort grows wild in the woods in many parts of *England*, where it flowers in *April* and *May*, making a pretty appearance in those places where they are in plenty. The roots of this may be taken up when their leaves decay, and transplanted in wildernesses, where they will thrive and increase greatly, if they are not disturbed; and in the spring, before the trees are covered with leaves, they will have a very good effect, in covering of the ground and making a pleasing variety at that season.

The third sort is found growing naturally in some parts of *England*, but particularly at *Wimbledon* in *Surrey*, in a wood near the mansion-house, in great plenty; but it is not certain that they were not originally planted there, as they are not found in any other place in that neighbourhood.

The fourth sort grows naturally in *North America*, from whence the seeds are frequently sent to *England*. This is a very hardy plant, and produces plenty of seeds in *England*, but having little beauty, scarce deserves a place in gardens, unless for the sake of variety.

The fifth and sixth sorts are natives of the East, from whence their roots were brought originally; but have been

so greatly improved by culture, as to render them some of the chief ornaments to our gardens in the spring. The principal colours of these flowers are red, white, purple, and blue, and some are finely variegated with red, white, and purple. There are many intermediate shades of these colours; the flowers are large and very double, and, when properly managed, are extremely beautiful.

The soil in which these flowers will thrive extremely, may be composed in the following manner: Take a quantity of fresh untried earth (from a common or some other pasture land) that is of a light sandy loam, or hazel mould, observing not to take it above ten inches deep below the surface; and if the turf be taken with it the better, provided it hath time to rot thoroughly before it is used: mix this with a third part of rotten cow dung, and lay it in a heap, keeping it turned over at least once a month for eight or ten months, the better to mix it, and rot the dung and turf, and to let it have the advantages of the free air. In doing this work, be careful to rake out all great stones, and break the clods; but by no means sift or screen the earth, which I have found very hurtful to many sorts of roots.

This earth should be mixed twelve months before it is used, if possible; but if you are constrained to use it sooner, you must turn it over the oftener, to mellow and break the clods; and observe to rake out all the parts of the green sward, that are not quite rotten, before you use it, which would be prejudicial to your roots, if suffered to remain. The beginning of *September* is a proper season to prepare the beds for planting (which if in a wet soil, should be raised with this sort of earth six or eight inches above the surface of the ground, laying at the bottom some of the rakings of your heap to drain off the moisture; but in a dry soil, three inches above the surface will be sufficient): this compost should be laid at least two feet and an half thick, and in the bottom there should be about four or five inches of rotten neats dung, or the rotten dung of an old melon or cucumber bed, so that you must take out the former soil of the beds to make room for it.

And observe in preparing your beds, to lay them (if in a wet soil) a little round, to shoot off the water; but in a dry one, let it be nearer to a level; in wet land, where the beds are raised above the surface, it will be proper to fill up the paths between them in winter, either with rotten tan or dung, to prevent the frost from penetrating into the sides of the beds, which otherwise may destroy their roots. Your earth should be laid in the beds at least a fortnight or three weeks before you plant the roots, and a longer time would be yet better, that it may settle; and when you plant them, stir the upper part of the soil about six inches deep, with a spade; then rake it even and smooth, and with a stick draw lines each way of your bed at six inches distance, so that the whole may be in squares, that your roots may be planted regularly: then with three fingers make a whole in the center of each square, about three inches deep, laying therein a root with the eye uppermost; and when you have finished your bed, with the head of a rake draw the earth smooth, so as to cover the crown of the roots about two inches thick.

The best season for planting these roots, if for forward flowers, is about the latter end of *September*; and for those of a middle season, any time in *October*; but observe to perform this work, if possible, at or near the time of some gentle showers; for if you should plant them when the ground is perfectly dry, and there should no rain fall for three weeks or a month after, the roots will be very apt to grow mouldy upon the crown; and if once they get this distemper, they seldom come to good after.

You may also reserve some of your Anemone roots till after *Christmas*, before you plant them, lest by the severity

of the winter your early planted roots should be destroyed, which does sometimes happen in very hard winters, especially in those places where they are not covered to protect them from frost: these late planted roots will flower a fortnight or three weeks after those which were planted in autumn, and many time blow equally as fair, especially if it prove a moist spring, or that care be taken to refresh them with water.

But then the increase of these roots will not be near so great as those of your first planting, provided they were not hurt in winter; and it is for this reason all those who make sale of these roots, are forward in planting; but in such gardens where these flowers are preserved with care, there is always provision made to cover them from the injuries of the weather, by arching the beds over with hoops, or frames of wood, and covering them with garden mats or cloths, in frosty nights, and bad weather, especially in the spring of the year, when their buds begin to appear; for otherwise, if you plant the best and most double flowers, the black frosts and cutting winds in *March* will often cause them to blow single, by destroying the thrum that is in the middle of the flower; and this many times hath occasioned many people who have bought the roots, to think they were cheated in the purchase of them, when it was wholly owing to their neglect of covering them, that their flowers became single.

Toward the latter end of *June*, the leaves of your first blown roots will begin to decay; soon after which time you must take them out of the ground, clearing them from decayed stalks, and washing them, to clean the earth from the roots; then spread them on a mat in a dry shady place till they are perfectly dried, when you may put them up in bags, and hang them out of the reach of mice, or other vermin, which will destroy many of the roots if they can come at them.

As all the fine varieties of these flowers were first obtained from seeds, so no good florist, that hath garden room, should neglect to sow them; in order to which, they should provide themselves with a quantity of good roots of the single (or what the gardeners call Poppy Anemonies) of the best colours, and such as have strong stems and large flowers, but especially such as have more leaves than common, and also other good properties; these should be planted early, that they may have strength to produce good seeds, which will be ripe in three weeks or a month's time, after the flowers are past; when you must carefully gather it, otherwise it will be blown away in a short time, it being inclosed in a downy substance. You must preserve this seed till the beginning of *August*, when you may either sow it in pots, tubs, or a well prepared bed of light earth: in the doing of it you must be careful not to let your seeds be in heaps, to avoid which is a thing little understood, and is what I have been informed of by the late *Mr. Obadiab Lowe*, gardener at *Battersea*, who for several years raised large quantities of these flowers from seeds: his manner was thus:

After having levelled his bed of earth, in which he intended to sow his seeds, he rubbed his seeds well between his hands, with a little dry sand, in order to make them separate the better; then he sowed them as regularly as possible over the bed; but as these seeds will still adhere closely together by their down, so he made use of a strong hair brush, with which he gently swept over the whole bed, observing not to brush off the seeds; this brush will so separate the seeds, if carefully managed, as not to leave any entire lumps; then gently sift some light earth, about a quarter of an inch thick over the seeds; and, if it should prove hot dry weather, it will be advisable to lay some mats hollow upon the bed in the heat of the day, and now and then

give them a little water; but this must be given gently, lest by hastily watering you wash the seeds out of the ground; but be sure to uncover the bed at all times when there are gentle showers, and every night, that the seeds may have the benefit of the dews; and as the heat of the weather decreases, you may begin to uncover your bed in the day time also.

In about two months after sowing, your plants will begin to appear, if the season has proved favourable, or your care in management hath not been wanting, otherwise they many times remain a whole year in the ground. The first winter after their appearing above ground, they are subject to injuries from hard frosts, or too much wet, against both of which you must equally defend them; for the frost is very apt to loosen the earth, so that the young plants are often turned out of the ground, after which a small frost will destroy them; and too much wet often rots their tender roots, so that all your former trouble may be lost in a short time for want of care in this particular; nor do I know of any thing more destructive to these tender plants, than the cold black frosts and winds of *February* and *March*, from which you must be careful to defend them, by placing a low reed fence on the north and east sides of the bed, which may be moveable, and only fastened to a few stakes to support it for the present, and may be taken quite away as the season advances, or removed to the south and west sides of the bed, to screen it from the violence of the sun, which often impairs these plants when young.

As the spring advances, if the weather should prove dry, you must gently refresh them with water, which will greatly strengthen your roots; and when the green leaves are decayed, if your roots are not too thick to remain in the same bed another year, you must clear off all the weeds, and decayed leaves, from the bed, and sift a little more of the same prepared good earth, about a quarter of an inch thick over the surface, and observe to keep them clear from weeds during the summer season, and at *Michaelmas* repeat the same earthing; but as these roots so left in the ground, will come up early in the autumn, the beds should be carefully covered in frosty weather, otherwise their leaves will be injured, whereby the roots will be weakened, if not destroyed. If your roots succeed well, many of them will flower the second year, when you may select all such as you like, by marking them with a stick; but you should not destroy any of them till after the third year, when you have seen them blow strong, at which time you will be capable to judge of their goodness; for until the roots have acquired strength, the flowers will not shew themselves to advantage.

The single (or Poppy) Anemonies will flower most part of the winter and spring, when the seasons are favourable, if they are planted in a warm situation, at which time they make a fine appearance, therefore deserve a place in every flower garden, especially as they require little culture. There are some fine blue colours amongst these single Anemonies, which, with the scarlets and reds, make a beautiful mixture of colours; and as these begin flowering in *January* or *February*, when the weather is cold, they will continue a long time in beauty, provided the frost is not too severe. The seeds of these are ripe by the middle or end of *May*, and must be gathered daily as it ripens, otherwise it will soon be blown away by the winds

ANEMONOIDES. See Anemone.

ANEMONOSPERMOS. See Arctotis.

ANETHUM. Dill.

The Characters are,

It is an umbelliferous plant with many umbels, which are uniform. The flowers have five spear-shaped petals; under the flower is situated the germen, which after-ward becomes two compressed seeds having borders.

We have but one *Species* of this genus, *viz.*

ANETHUM fructibus compressis. Hort. Cliff. 106. Garden or common Dill.

This plant is propagated by sowing the seeds in autumn, soon after they are ripe; for if they are kept out of the ground till spring, they frequently miscarry; or if any of the plants do come up, they often decay before they have perfected their seeds. They love a light soil, and will not bear to be transplanted, but must be sown where they are to remain; for if the plants are removed, they will not produce good seeds; therefore the best way is, when the plants are come up, to hoe them out, as is practised for Onions, Carrots, &c. leaving the plants about eight or ten inches asunder every way, observing to keep them clear from weeds, when the seeds are ripe; the heads or umbels should be cut, and spread upon a cloth to dry, and then beat out for use; and if you let some seeds fall upon the ground, they will arise the next spring without any care, so that the trouble of sowing their seeds may be spared.

ANGELICA.

The *Characters* are,

It is an umbelliferous plant, the greater umbel being composed of many small ones; the empalement of the flowers are indented in five parts. The flowers of the whole umbel are uniform. The germen is situated below the flower, which afterward becomes a roundish fruit splitting into two, and composed of two seeds, which are plain on one side and convex on the other, and are bordered.

The *Species* are,

1. *ANGELICA foliorum impari lobato. Flor. Lapp. 101.* Common Garden Angelica.

2. *ANGELICA altissima foliorum lobatis maximis serratis.* Commonly called Archangelica.

3. *ANGELICA foliis æqualibus ovato-lanceolatis serratis. Hort. Cliff. 97.* Greater wild Angelica.

4. *ANGELICA extimo foliorum pari coadunato folio terminali petiolato. Prod. Leyd. 103.* Dark Purple Angelica of Canada.

5. *ANGELICA foliis æqualibus ovatis inciso-serratis. Hort. Cliff. 97.* Shining Angelica of Canada.

The first sort is the common Angelica, which is cultivated in the gardens for medicinal use, as also for making a sweet-meat, which is by some greatly esteemed. This grows naturally by the side of rivers in Lapland, and other northern countries.

The second sort grows naturally in Hungary, and some parts of Germany.

The third sort grows naturally in moist meadows, and by the sides of rivers in many parts of England, so is seldom admitted into gardens.

The fourth and fifth sorts grow naturally in North America, from whence their seeds were sent to Europe, where the plants are preserved in gardens for the sake of variety; but as they are of no use, and have little beauty, so they are not admitted into many gardens. They are both very hardy plants, and may be easily propagated by seeds, which should be sown in autumn, and afterward the plants should be transplanted into a moist soil, and have a shady situation, allowing them room on every side. They grow near four feet high, and put out many shoots from the root, especially the second year from seed, when they will flower in June, and the seeds ripen in September. The roots of these sorts seldom continue longer than three or four years.

The common Angelica delights to grow in a very moist soil; the seeds of this plant should be sown soon after they are ripe, for if they are kept until the spring, seldom one seed in forty will grow. The best place for this plant is upon the sides of ditches, or pools of water, where being planted about three feet asunder, they will thrive exceedingly. The second year after sowing, they will shoot up to flower; therefore if you have a mind to continue their

roots, you should cut down these stems in May, which will occasion their putting out heads from the sides of the roots, whereby they may be continued for three or four years; whereas if they had been permitted to feed, their roots would perish soon after.

The gardeners near London, who have ditches of water running through their gardens, propagate great quantities of this plant, for which they have a great demand from the confectioners, who make a sweet-meat with the tender stalks of it, cut in May.

This plant is also used in medicine, as are also the seeds; therefore where it is cultivated for the seeds, there should be new plantations annually made to supply the places of those which die, for when they are permitted to feed, they last but two years.

ANGUINA. See Tricofanthes.

ANGURIA. The Water Melon, or Citrul.

The *Characters* are,

It hath male and female flowers growing separate on the same plant; the flowers of both sexes, are of the open bell-shaped kind, of one leaf. The male flowers have three short stamina, which are joined together. The female flowers rest upon an oval germen, which afterward becomes an oblong fleshy fruit, having five cells filled with compressed seeds, which are rounded at their extremity.

We have but one *Species* of this genus, *viz.*

ANGURIA foliis multipartitis. Water Melon, called Citrul.

Of this there are several varieties, which differ in the form and colour of their fruit. But as these vary annually from seeds, so it is needless to enumerate them here.

This fruit is cultivated in Spain, Portugal, Italy, and most other warm countries in Europe; as also in Africa, Asia, and America; and is by the inhabitants of those countries, greatly esteemed for their wholesome cooling quality; but in England the fruit is not so universally esteemed, though there are some few persons who are very fond of them.

To have this fruit good, you must first provide yourself with some seeds, which should be three or four years old; for new seeds are apt to produce vigorous plants, which are seldom so fruitful as those of a moderate strength. The best sorts to cultivate in England, are those with small round fruit, which come from Astracan, for those with very large fruit, seldom ripen in this climate. Having provided yourself with good seed, you may sow it in the hot-bed for early cucumbers; then you should prepare a heap of new dung the beginning of February, which should be thrown in a heap for about twelve days to heat, as is practised for early cucumbers. When the dung is of a proper temper, the bed should be made in the same manner as for the Musk Melon, covering the dung about three inches thick with loamy earth; for the plants may be raised fit to plant out for good, in the same bed with the early Cucumbers, so the bed here mentioned is where they are to remain for good. But as these plants require much more room than either Cucumbers or common Melons, so there should be but one plant put into a three light frame: therefore a hill of the same loamy earth should be raised a foot and an half high in the middle light of each frame, into which when the bed is of a proper temper for heat, the plants should be carefully planted, observing to water and shade them until they have taken good root.

After these plants are placed in these beds, you must be careful to admit fresh air to them by raising of the glasses in proportion to the weather; and as their branches extend you should lead the shoots as they are produced, so as to fill each part of the frame, but not to crowd each other; and be careful to keep them clear from weeds; they must also be frequently watered, but do not give it them in great quantities. In short, there is little difference to be observed in the

the management of these, from that of Musk Melons, but only to give them more room, earthing the beds to the same depth, and adding to the sides of the beds for the roots of the plants to run into it, and to keep the beds to a good temperature of heat; and when the fruit appears, to admit air freely to the plants, in order to set their fruit; but when the nights are cold, the glasses must be covered with mats to keep the beds warm, without which this fruit will seldom come to be good in this country.

ANIL. The Indigo Plant.

The Characters are,

The flower is of the butterfly kind. The standard is open, bordered, and reflexed. The wings are oblong, blunt, and spread open, as is also the keel, which turns backwards. In the center is situated a cylindrical germen, which afterward becomes a taper pod, filled with kidney-shaped seeds.

The Species are,

1. ANIL *leguminibus arcuatis incanis racemis folio brevioribus caule fruticoso perenni.* The Jamaica wild Indigo.
2. ANIL *leguminibus sessilibus arcuatis glabris foliis impari pinnatis foliolis ovatis obtusis.* The Guatimala Indigo.
3. ANIL *leguminibus tercibus brevibus foliis pinnatis quinifve, spicis florum longissimis laxis, radice perenne.* This is the Carolina wild Indigo.

The first and second sorts are annual plants with us; the seeds of these must be sown on a hot bed early in the spring of the year; and when the plants are come up two inches high, they should be transplanted into small pots filled with good fresh earth, and the pots plunged into a hot-bed of tanners bark; as the plants obtain strength, they must have a great share of a free air, by raising the glasses in the day time; in June they may be exposed to the open air, by which time they will begin to produce their flowers, which will be succeeded by pods in a short time after, and in August their seeds will be perfected, if the plants are brought forward in the spring.

The third sort grows to the height of five or six feet, and will abide two or three years, if it is preserved in a very warm stove in winter; this produces spikes of flowers from the wings of the leaves on the sides of the stems of the plant, and doth sometimes perfect its seeds in England. This must be raised in a hot-bed, as was directed for the former, but must not be wholly exposed to the open air, even in the hottest weather.

The second and third sorts are supposed to be promiscuously used to make the Indigo, but the second is the common sort which is cultivated in the English plantations in America; but I have been assured by a person of great credit, that he has made as good Indigo from the first sort, as any that was produced in our plantations; and this being a much larger plant, will afford a greater quantity from the same compass of ground, than any one of the other species; and this sort will grow on poorer land, so may be cultivated in such places where the first sort will not thrive; by which means improvements may be made with this plant in our American plantations. But the French chiefly cultivate the second sort, which is generally called Guatimala Indigo; but there are some other sorts of this plant, which are natives of India, from which this commodity is made; two of which I have had growing in the garden at Chelsea, both which are very different in their leaves and pods from either of the American sorts. I have also received seeds from India of the third sort, which is the same species of Indigo which grows naturally in South Carolina, and which was greatly esteemed some years ago by the Indigo planters of that country, for the beauty of the commodity which it produced; but the plants being slender, and thinly garnished with leaves, which were small, they did not furnish a quantity of Indigo, in proportion to their bulk, so of late this sort has not been

much cultivated there; though the account which I receiv'd with the seeds was, that it was what the best Indigo of India was made from.

The whole process of making the Indigo, would swell this volume beyond the intended size, so is omitted here.

ANISUM, or ANISE. See Pimpinella.

ANNONA. *Lin. Gen. Plant.* 613. The Custard Apple.

The Characters are,

The flower hath in some species three, and in others six petals, three large and three alternately smaller. The germen afterward becomes an oval, or oblong fruit, having a scaly rind, and one cell, in which are lodged many oval smooth seeds.

The Species are,

1. ANNONA *foliis lanceolatis fructibus ovatis reticulato-arcolatis.* *Lin. Sp. Plant.* 537. The Custard Apple.
2. ANNONA *foliis ovali-lanceolatis glabris nitidis planis pomis muricatis.* *Hort. Cliff.* 222. The Sour Sop.
3. ANNONA *foliis oblongis fructibus obtuse subsquamatis.* *Lin. Sp. Plant.* 537. The Sweet Sop.
4. ANNONA *foliis oblongis obtusis glabris, fructu rotundo, cortice glabro.* The Water Apple.
5. ANNONA *foliis latissimis glabris, fructu oblongo squamato, seminibus nitidissimis.* This is called Cherimolhas by the Spaniards.
6. ANNONA *foliis ovato-lanceolatis pubescentibus fructu glabro subcaeruleo.* The Sweet Apple.
7. ANNONA *foliis lanceolatis glabris nitidis secundum nervos sulcatis.* *Hort. Cliff.* 222. The Purple Apple.
8. ANNONA *foliis lanceolatis fructibus trifidis.* *Lin. Sp. Pl.* 537. The North American Annona, called by the inhabitants Papaw.

The first sort usually grows to the height of twenty-five feet, or upwards, in the West-Indies, and is well furnished with branches on every side; the leaves are oblong, pointed, and have several deep transverse ribs or veins, and are of a light green colour; the fruit is of a conical form, and as large as a tennis ball, of an Orange colour when ripe, having a soft sweet yellowish pulp, of the consistence of a custard, from whence this name was given to it.

The second sort does not grow so large as the first, rarely rising above twenty-five feet high, and not so well furnished with branches; the leaves are broader, and have a smooth surface without any furrows, and are of a shining green colour; the fruit is large, of an oval shape, irregular, and pointed at the top, being of a greenish yellow colour, and full of small knobs on the outside.

The third sort is a tree of humbler growth, seldom rising so high as twenty feet, and is well furnished with branches on every side; the leaves of this sort have an agreeable scent when rubbed; the fruit is roundish and scaly, and when ripe turns of a purple colour, and hath a sweet pulp.

The fourth sort commonly grows from thirty to forty feet in the West-Indies. This hath oblong pointed leaves, which have some slender furrows, and when rubbed have a strong scent; the fruit of this sort is seldom eaten but by the negroes.

The fifth sort is much cultivated in Peru for the fruit. This grows to be a very large tree in its natural country, and is well furnished with branches, which are garnished with leaves of a bright green colour, and much larger than those of any of the other sorts. The fruit is oblong, and is scaly on the outside, and of a dark purple colour when ripe.

The sixth and seventh sorts grow in some of the French islands, as also in Cuba, in great plenty; these grow to the height of thirty feet or more; their fruit are esteemed by the inhabitants of those islands, who frequently give them to sick persons, as they reckon them very cooling and wholesome.

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The eighth sort grows plentifully in the *Bahama Islands*, where it seldom rises to more than ten feet high, having several stems; the fruit of this sort are shaped like a pear inverted. This is seldom eaten but by the negroes, and is the food of guanas, and other animals.

This sort will thrive in the open air in *England*, if it is planted in a warm sheltered situation; but the plants should be trained up in pots, and sheltered in winter, for two or three years, until they have acquired some strength; then they may be turned out of the pots in the spring, and planted in the full ground, where they are to remain. This sort flowers in many curious gardens. The seeds of this are frequently brought to *England* from *North America*; and many plants have been lately raised in the gardens near *London*. The seeds of this sort are very different in shape, from any of those which I have yet seen, which have been brought from the islands of the *West-Indies*, and the shape of the leaves are also different; this casts its leaves in autumn, whereas all the others retain their leaves until the spring, when the new leaves come out. The fruit is very different from those of the other species, two or three growing, together joined at their foot-stalks.

All the sorts, which are natives of the warm parts of *America*, are too tender to live in this country, if they are not preserved in warm stoves; they come up very easily from the seeds which are brought from *America*, if they are fresh; but the seeds must be sown on a good hot-bed, or in pots of light earth, and plunged into a hot-bed of tanners bark, pretty early in the spring; because if the plants come up early, they will have time to get strength, before the cold weather comes on in the autumn.

If these plants are kept in the bark stove, and carefully managed, they will make great progress; but in warm weather they should have plenty of fresh air admitted to them; for when the air is excluded from them too much, they are apt to grow sickly; when they will soon be attacked by vermin, which will multiply and spread over the whole surface of the leaves, and cause them to decay; but if the plants are carefully managed, their leaves will continue green all the winter, and make a very good appearance in the stove at that season.

They must constantly remain in the tan bed, otherwise they will make but little progress; for although they will live in a dry stove, yet they will not thrive, nor will their leaves appear so fine, as when they are preserved in a vigorous growing state; and it is more for the beauty of their leaves, than any hopes of their producing fruit in this country, that they are preserved in stoves; for though there has been some of the sorts which have produced flowers in *England*, yet none have ever shewn their fruit here.

ANTHEMIS. *Lin. Gen. Plant.* 870. Chamomile.

The Characters are,

It is a plant with a compound flower. The border, or rays of the flower, is composed of many female flowers, whose petals are stretched out like tongues on one side. The middle, or disk of the flower, is composed of many hermaphrodite florets, which are funnel shaped, erect, and cut into five parts at the top. The germen is situated at the bottom, which after-ward becomes an oblong naked seed.

The Species are,

1. ANTHEMIS foliis pinnato-compositis linearibus acutis subvillosis. *Lin. Sp. Pl.* 894. Common, or noble Chamomile.
2. ANTHEMIS receptaculis conicis paleis setaceis seminibus coronato-marginatis. *Flor. Suec.* 704. Wild Chamomile, or May Weed.
3. ANTHEMIS receptaculis conicis paleis setaceis seminibus nudis. *Lin. Sp. Plant.* 894. Stinking May Weed.
4. ANTHEMIS forum paleis rigidis pungentibus. *Flor. Leyd.* 172. Chamomile with stiff pungent chaff between the flowers.

5. ANTHEMIS erecta foliorum apicibus subspinosis. *Lin. Sp. Plant.* 893. Spanish Chamomile with a large flower.

6. ANTHEMIS foliis pinnatis denticulatis carnosus caule ramoso. *Lin. Sp. Plant.* 893. Sea Chamomile.

7. ANTHEMIS foliis pinnatifidis obtusis planis, pedunculis hirsutis, foliosis calycibus tomentosus. *Hort. Cliff.* 415. Hoary Sea Chamomile with a thick Wormwood leaf.

8. ANTHEMIS foliis simplicibus dentato-laciniatis. *Lin. Sp. Plant.* 894. Broad-leaved Portugal Chamomile, with a buck's horn leaf.

9. ANTHEMIS foliis pinnato-multifidis planis, laciniis linearibus acutis trifidis, pedunculis longissimis. *Hort. Cliff.* 415. Eastern Chamomile with a Wormwood leaf.

10. ANTHEMIS foliis simplicibus ovato-lanceolatis repando crenatis. *Lin. Sp. Plant.* 895. Portugal Chamomile with a Maudlin leaf.

11. ANTHEMIS caulibus unifloris decumbentibus foliis pinnato-multifidis. *Lin. Hort. Cliff.* 414. Pellitory of Spain.

12. ANTHEMIS foliis bipinnatis laciniis linearibus integris, pedunculis nudis longissimis. *Flor. Leyd. Prod.* 171. Alpine Ox Eye with a Wormwood leaf.

13. ANTHEMIS foliis bipinnatis serratis subtus tomentosus caule corymbofo. *Lin. Sp. Plant.* 896. Alpine Ox Eye with a white flower.

14. ANTHEMIS foliis pinnatis acutè serratis subtus tomentosus, pedunculis florum longissimis. Ox Eye with Tan'ey leaves.

15. ANTHEMIS foliis ovatis integris sessilibus floribus umbellatis sparsis. Eastern Ox Eye with a winged woolly leaf.

The first sort is the common Chamomile, which grows in plenty upon commons, and other waste land. It is a trailing perennial plant, which puts out roots from the branches as they lie on the ground, whereby it spreads and multiplies greatly; so that whoever is willing to cultivate this plant, need only procure a few of the slips in the spring, and plant them a foot asunder, that they may have room to spread, and they will soon cover the ground. The flowers of this sort are ordered for medicinal use, but the market people generally sell the double flowers, which are much larger, but not so strong as the single. The double sort is equally hardy, and may be propagated in the same manner.

The second sort is a common annual weed, which grows among corn; it flowers in *May*, so was called *May Weed*, though some have applied that title improperly to the *Cotula fatida*, which rarely flowers till late in *June*. This is the third sort here enumerated, of which there is a variety with double flowers, which is preserved by often planting the slips and cuttings; so that although the plant is naturally an annual, yet by this method it may be continued.

The fourth, fifth, and eighth sorts are annual plants, which grow naturally in *Spain*, *Portugal*, *Italy*, and the south of *France*; the plants are preserved in botanick gardens for the sake of variety, but are seldom allowed a place in others. They flower in *July*, and their seeds ripen in *September*.

The sixth, seventh, ninth, tenth, twelfth, thirteenth, fourteenth, and fifteenth sorts are perennial plants; these grow naturally in *Spain*, *Portugal*, and *Greece*, the plants are preserved in some curious gardens for the sake of variety. They are hardy, and may be propagated either by seeds or slips; if by seeds, they should be sown in the spring upon poor land, where the plants will continue much longer than in good ground. The slips may be planted during any of the summer months, observing to plant them in a shady border, and water them until they have taken root. In the autumn they may be removed to the places where they are to remain, and will require no other care but to keep them clean from weeds. These plants do not grow tall, but are bushy, so should be allowed room. They continue in flower from *July* to *October*, and the seeds ripen in autumn.

The

The eleventh sort is the Pellitory of *Spain*, the roots of which are used for the tooth-ach, being extremely warm; when they are applied to the part affected, they draw out the cold rheum, and are often serviceable. This is a perennial plant, with a long taper root like a Carrot, which grows naturally in *Spain* and *Portugal*, from whence the roots are brought to *England*. The branches of this trail upon the ground, and spread a foot or more on every side, and have fine winged leaves, like those of the common Chamomile; at the extremity of each branch is produced one large single flower like Chamomile, but much larger, the rays of which are of a pure white within, but purple on their outside. It flowers in *June* and *July*, and the seeds are ripe in *September*; but unless the season is warm and dry, the seeds do not ripen in *England*, for the wet falls between the scales, and rots the seeds in embryo.

The twelfth and thirteenth sorts are perennial plants, which do not rise more than two feet high; the leaves are hoary, and have some resemblance to those of the common Wormwood.

These sorts are propagated by seeds, which they produce in plenty, and may be sown on a bed of common earth in the spring; when the plants are strong enough to remove, they may be transplanted into large open borders, near shrubs, where they may have room to grow, for they spread out on every side, therefore require three feet distance from other plants; in these large open spots, they will make a pretty variety from *June* to *November*, during which time they continue in flower: some of these are white, others are of a sulphur, and some have yellow flowers, but these vary from seed.

ANTHERICUM. *Lin. Gen. Plant.* 380. Spiderwort.

The Characters are,

The flower hath no empalement, and is composed of six petals, which spread open. It hath six upright stamina. The germen, which is situated in the center is three-cornered, which after-ward becomes an oval smooth capsule, having three furrows, opening in three cells, which are filled with angular seeds.

The Species are,

1. ANATHERICUM foliis planis scapo ramoso corollis revolutis. *Lin. Sp. Plant.* 310. Asphodel, with rough compressed leaves and a spreading stalk.

2. ANATHERICUM foliis planis scapo ramoso corollis planis. *Lin. Sp. Pl.* 310. Branching Spiderwort with a small flower.

3. ANATHERICUM foliis planis scapo simplicissimo. *Hort. Upsal.* 83. Branchless Spiderwort with a small flower.

4. ANATHERICUM foliis carnosis teretibus caule fruticoso. *Lin. Sp. Plant.* 310. Cape Spiderwort with stalks and pulpy Onion leaves.

5. ANATHERICUM foliis carnosis subulatis planiusculis. *Hort. Upsal.* 83. Low Cape Spiderwort, with Aloe-shaped pulpy leaves.

6. ANATHERICUM foliis carnosis subulatis semiteretibus stricis. *Hort. Upsal.* 83. Low Asphodel, with awl-shaped succulent leaves.

7. ANATHERICUM foliis carnosis subulatis teretibus. *Hort. Upsal.* 83. Small yellow African Spiderwort, with narrow leaves.

8. ANATHERICUM caule foliis carnosis teretibus spicis florum longissimis laxis. *Fig. Plant. pl.* 39. Low African Spiderwort with taper fleshy leaves and very long loose spikes of flowers.

9. ANATHERICUM sessile foliis linearibus planis caule decumbente. *Fig. Plant. pl.* 39. f. 2. Low Spiderwort with narrow plain leaves and a trailing stalk.

10. ANATHERICUM foliis ensiformibus filamentis lanatis. *Flor. Succ.* 268. Marsh yellow Asphodel.

11. ANATHERICUM foliis ensiformibus perianthiis trilobis filamentis glabris. *Flor. Succ.* 269. Marsh Alpine Spiderwort, with an Iris leaf.

The first sort grows near two feet high; the stalk branches out on every side, each branch being terminated by a loose spike of flowers, which are white, and the petals are turned backward to their foot-stalk. The leaves of this sort are flat, and the root is perennial, but the branches decay in autumn.

The second sort hath a perennial root, but an annual stalk, which decays in autumn; the stalks of this rise about the same height as the former, sending out many lateral ones in like manner, which are terminated by loose spikes of flowers, which are white, but the petals are plain, and do not turn back as in the other sort.

The third sort hath plain leaves and an unbranching stalk, in which it chiefly differs from the former. The root of this is perennial, but the stalks decay in winter.

These three sorts grow naturally in *Spain*, *Portugal*, and other warm countries; they were more common some years ago in the *English* gardens, than at present; for the severe winter in 1740, killed most of their roots. These flower in *June* and *July*, and their seeds are ripe in *September*. They are propagated by seeds, which should be sown in autumn: these should be sown in a bed of light sandy earth, in a warm situation; when the plants come up, they must be kept clean from weeds during the summer, and in autumn, when their leaves decay, they should be carefully taken up, and transplanted, in the borders of the flower-garden, where they will last several years, if they are not killed by frost; to prevent which, some rotten tan should be laid over the roots in winter, which will always secure them.

The fourth sort has been long preserved in many gardens near *London*, and was formerly known among the gardeners, by the title of Onion-leaved Aloe. This plant produces many lignous branches from the root, each having a plant with long taper leaves, in shape of those of the Onion, which are full of a yellow pulp very juicy. It grows naturally at the *Cape of Good Hope*, and requires a little shelter in the winter, but in some mild seasons I have had plants live without any cover, which were planted close to a warm wall.

The fifth and sixth sorts grow close to the ground, never rising with any stalk. The fifth hath broad, flat, pulpy leaves, resembling those of some sorts of Aloe. The leaves spread open flat on the ground, and the flowers are produced on loose spikes, like the former, but they are shorter. The flowers are yellow, and appear at different seasons. This is propagated by offsets, which are put out in plenty, and must be planted in pots filled with light sandy earth, and in winter placed in the green-house, and treated as other hardy succulent plants, which come from the *Cape of Good Hope*.

The sixth sort hath long narrow pulpy leaves, which are almost taper, but flated on their upper side; this sends out many offsets, by which it may be increased plentifully. It must be treated in the same manner as the former.

The seventh sort is annual: this is a low plant growing close to the ground, having pretty long succulent leaves, which are taper, but flated on their upper side; the flowers grow in loose spikes, which are shorter than either of the other sorts. They are yellow, and are succeeded by round seed vessels, like those of the former sorts; the plants perish soon after their seeds ripen. The seeds of this sort should be sown on a warm border of light earth, in *April*, where they are to remain, and will require not other care but to keep them clean from weeds, and to thin them where they are too close.

The eighth sort never rises to a stalk, but the leaves come out close to the ground. These are long, taper, succulent, and of a sea-green colour, growing erect; the flower-stems rise between the leaves, and are near three feet long.

long. The plants are seldom long destitute of flowers. It must be treated in the same manner as the fourth, fifth, and sixth sorts.

The ninth sort is a native of *Jamaica*, where it grows naturally in moist places; this is a very low plant, having many long narrow leaves like those of grass; from between these come out the flower-stalks, which are five or six inches in length, falling to the ground; at the top the flowers are collected into small heads; these are yellow, and shaped like those of the former. They appear in *June* and *July*, and their seeds ripen in *August* and *September*. This is tender, so must be placed in a stove, otherwise the plants will not live in this country: it may be easily propagated by seeds, which should be sown on a hot-bed in the spring.

The tenth and eleventh sorts grow naturally on bogs in most of the northern countries; the tenth is common in many parts of *England*, but particularly in *Lancashire*, from whence it had the title of *Lancashire Asphodel*; it also grows on a bog upon *Putney-beath*. The other grows naturally in *Denmark*, *Sweden*, and *Lapland*. The flower-stems rise about six inches high, being terminated by a loose spike of small yellow flowers. These plants, growing naturally upon bogs, are with difficulty preserved in gardens.

ANTHOLYZA. We have no *English* name for this plant.

The Characters are,

It hath an imbricated sheath, which is permanent; the flower is of one leaf, and opens above with compressed jaws. The under lip is trifid and short; the middle segment turns downward. Under the flower is situated the germen, which afterward becomes a roundish three-cornered vessel having three cells, in which are lodged many triangular seeds.

The Species are,

1. ANTHOLYZA *flamine unico declinato*. *Lin. Sp. Plant.* 37. Antholyza with one stamen declining.
2. ANTHOLYZA *foliis linearibus sulcatis floribus albis uno versu dispositis*. *Fig. Plant. pl.* 40. Strange Corn-flag with narrow furrowed leaves, and white flowers ranged on one side of the stalk.

The first sort hath round red bulbous roots, from which arise several rough furrowed leaves, which are near a foot long, and half an inch broad; between these come out the flower-stem immediately from the root, which rises two feet high, is hairy, and hath several flowers coming out on each side. These are of one leaf, cut into six unequal parts at the top: the margins are waved and closed together, wrapping up the three stamens. These flowers are red, and appear in *June*, and the seeds ripen in *September*.

The roots of the second sort are in shape and size like those of the vernal *Crocus*, but the outer skin is thin and white; from this arises five or six long narrow leaves, which are deeply furrowed. Between these arise the flower-stem, which is a foot and an half high; the flowers come out, ranged on one side, standing erect. These have each a spatha, or sheath, of one leaf, divided into two, ending in points. The flower is of one leaf, having a long tube, but is divided into six unequal segments at the top, which spread open. After the flower is past, the germen becomes a three-cornered seed vessel, opening in three cells, which are filled with triangular seeds.

They are propagated by offsets, which the bulbous roots send forth in pretty great plenty; or by seeds, which are sometimes perfected in *Europe*. These seeds should be sown soon after they are ripe; if the seeds are sown in pots of light earth, and plunged into an old bed of tan which has lost its heat, and shaded in the middle of the day in hot weather, the seeds will come up the following winter; therefore they must be kept covered with glasses to screen them from cold. In summer, after the leaves are decayed, the

root should be taken up, and planted each into a separate small pot filled with light earth. In summer the pots may be placed in the open air in half-sun, but in winter they must be placed under a hot-bed frame, for they are not very tender; but where any damp arises, it is very apt to occasion a mouldiness upon their leaves. The roots shoot up in autumn, and the flowers begin to appear in *May*; the seeds ripen in *August*, and soon after their leaves and stalks decay. The roots may be easily transported from one country to another at the time when they are taken up. These flowers are a great ornament to the green-house when they are in flower, and as they require but little culture, so deserve a place in every good garden.

ANTHOSPERMUM. Amber Tree, *vulgò*.

The Characters are,

It is male and female in different plants; the male flowers have no petals. The female flowers have the same structure as the male, but have no stamens; instead of which there is an oval germen, situated in the bottom, which afterward becomes a roundish capsule having four cells, which contain several angular seeds.

We know but one Species of this genus, *viz.*

ANTHOSPERMUM *mas & femina*. *Hort. Cliff.* 455. Male and female Amber Tree.

It is preserved in many curious gardens, which have collections of tender plants, and is easily propagated by planting cuttings during any of the summer months, in a border of light earth; which will take root in six weeks time, provided they are watered and shaded as the season may require: then they should be taken up, with a ball of earth to their roots, and planted into pots filled with light sandy earth, and may be exposed to the open air until *October*; at which time they should be removed into the conservatory, where they should be placed as free as possible from being over-hung with other plants; and, during the winter season, they must be often refreshed with water, but should not have too much given them each time.

The beauty of this shrub is in its small ever-green leaves, which grow as close as heath; and, being bruised between the fingers, emit a very fragrant odour. The plants must be frequently renewed by cuttings, for the old plants are very subject to decay, seldom continuing above three or four years.

It is but of late years there have been any of the female plants in the gardens, for all those which were formerly in the gardens, were the male; which being propagated by cuttings had been continued, so that no seeds were ever produced in *England* till within a few years past, when I received some seeds from the *Cape of Good Hope*, from which I raised many plants of both sexes, and a few among them which have hermaphrodite flowers, which have seeds, from which many plants have been raised.

ANTHYLLIS. *Lin. Gen. Plant.* 773. Ladies Finger.

The Characters are,

The flower is of the butterfly kind, having a long standard reflexed on both sides beyond the empalement; the two wings are short; the keel is of the same length, and compressed. In the center is situated an oblong germen, which afterward becomes a small roundish pod included by the empalement, having one or two seeds.

The Species are,

1. ANTHYLLIS *herbacea foliis quaterno-pinnatis floribus lateralibus* *Hort. Upsal.* 221. Five-leaved Woundwort.
2. ANTHYLLIS *herbacea foliis pinnatis inæqualibus capitulo duplicato*. *Lin. Sp. Pl.* 719. Low Woundwort with a scarlet flower.
3. ANTHYLLIS *herbacea foliis pinnatis foliolis inæqualibus caulinis lineari lanceolatis floribus capitatis simplicibus*. Rustick Woundwort, or Ladies Fingers.

4. ANTHYLLIS herbacea foliis pinnatis æqualibus capitulo terminali. *Lin. Sp. Plant.* 719. Purple Milk Vetch.

5. ANTHYLLIS herbacea foliis pinnatis inæqualibus capitulis solitariis. *Lin. Sp. Pl.* 719. Herbaceous Woundwort, with unequal winged leaves and a single head.

6. ANTHYLLIS fruticosa foliis pinnatis æqualibus floribus capitatis. *Hort. Cliff.* 371. Jupiter's Beard, or Silver Bush.

7. ANTHYLLIS fruticosa foliis ternatis inæqualibus calycibus lanatis lateralibus. *Lin. Sp. Plant.* 720. Hoary Cytifus with a longer middle leaf.

8. ANTHYLLIS fruticosa spinosa foliis simplicibus. *Lin. Sp. Plant.* 720. Prickly Broom with duckmeat leaves and bluish purple flowers.

The first sort grows naturally in *Spain, Italy, and Sicily*. This is an annual plant, with trailing branches, which spread flat on the ground; the flowers, which are yellow, come out in clusters on the sides of the stalks, having large swelling empalements, and are succeeded by short pods inclosed in the empalement. It flowers in *June and July*, and the seeds ripen in *September*. The seeds of this sort should be sown on a bed of light earth in *April*, where the plants are to remain, and will require no other care, but to thin them to the distance of two feet, and keep them clean from weeds.

The second sort grows naturally in *Spain and Portugal*, from both which countries I have received the seeds; it also grows wild in *Wales*, and the *Isle of Man*. This is a biennial plant, having single leaves at bottom, which are oval and hairy; but those which grow out of the stalks are winged, each being composed of two or three pair of lobes terminated by an odd one: the flowers are collected into heads at the top of the stalks; these are of a bright scarlet colour, so make a pretty appearance: it flowers in *June and July*, and the seeds ripen in *October*. When the plants of this sort grow on poor land, they will sometimes continue three years, but in gardens they seldom last longer than two.

The third sort grows naturally upon chalky grounds in many parts of *England*, so is rarely admitted into gardens. The heads of flowers in this species are single, whereas the other has generally double heads.

The fourth sort is a perennial plant with trailing branches; at the extremity of the branches, the flowers are produced in heads; these are of a purple colour, and globular form. It grows naturally on mountains, in the south of *France and Italy*. It is propagated by seeds, which may be sown either in the autumn or spring: those which are sown in the autumn, will rise the following spring, and more certainly grow, than those which are sown in the spring, which seldom grow the same year. When the plants come up, they must be kept clean from weeds; and where they are too close together, they must be thinned. The following autumn, they should be transplanted to the places where they are to remain, and will require no particular management afterward. This sort flowers in *June and July*, and the seeds ripen in *October*.

The fifth sort approaches near to the third, but the leaves are hoary, and the flowers are produced on the side of the branches; these are yellow, and collected into small heads. This may be propagated by seeds as the former.

The sixth sort is the *Barba Jovis*, or *Jupiter's Beard*, by many called Silver Bush, from the whiteness of its leaves. This is a shrub which often grows ten or twelve feet high, the leaves are very white and hairy; the flowers are produced at the extremity of the branches, collected into small heads; these are of a bright yellow colour, and appear in *June*. It is propagated either by seeds or cuttings; if by seeds, they should be sown in the autumn, in pots filled with light earth, and placed under a frame in winter to protect them from frost. The following spring the plants will

rise, and when they are strong enough to remove, they should be each planted in a small pot filled with light earth, and placed in the shade, till they have taken new root; after which, they may be placed with other hardy exotick plants, in a sheltered situation, where they may remain till *October*, when they must be removed into shelter. These plants are too tender to live in the open air here in winter, though I have had some of them live abroad two or three years, which were planted against a south-west aspect wall. It may also be propagated by cuttings, which may be planted during any of the summer months, observing to water and shade them until they have taken root.

The seventh sort is a low shrub, seldom rising above two feet high, but sends out many slender branches, which are garnished with hoary leaves; they are sometimes single, but generally have three oval lobes, the middle being longer than the other two; the flowers are white, and come out from the side of the branches, three or four joined together having woolly empalements, but these are rarely succeeded by seeds in *England*. It may be propagated by cuttings, in the same manner as the former sort, and treated as hath been directed for that.

The eighth sort grows naturally in *Spain and Portugal*. This is a shrub which grows nine or ten feet high, having the appearance of one sort of *Gorse or Whin*, but it hath round leaves growing single. It will live in the open air in mild winters, but hard frost will destroy it. It is propagated by seeds only.

ANTIRRHINUM, Snap-dragon, or Calves-snout.

The Characters are,

The flower is ringent, having an oblong tube, and divided at the top into two lips, which are closed at the jaw. In the bottom is situated an obtuse nectarium, which is not prominent. In the center is placed a roundish germeu, which afterward becomes a round obtuse capsule having two cells, which are full of small angular seeds.

To this genus *Linnaeus* has joined the *Linaria* and *Afarina*; but as the flowers of the *Linaria* have spurs to their petals, and the nectarium being very prominent, which are not so in this genus, so it should be separated from it; especially as there are many species of both kinds, which cannot so well be distinguished when both genera are joined in one.

The Species are,

1. ANTIRRHINUM foliis lanceolatis obtusis alternis caule ramosissimo diffuso. *Hort. Cliff.* 324. The least Field Snap-dragon.

2. ANTIRRHINUM foliis lanceolatis petiolatis calycibus corollâ longioribus. Greater Field Snap-dragon.

3. ANTIRRHINUM foliis lanceolatis petiolatis calycibus brevissimis racemo terminali. *Vir. Cliff.* 61. Another great Snap-dragon with a longer leaf.

4. ANTIRRHINUM foliis lanceolatis glabris, calycibus hirsutis racemo longissimo. Broad-leaved Snap-dragon with a large pale flower.

5. ANTIRRHINUM foliis lineari-lanceolatis hirsutis racemo brevioris. Greater Italian long-leaved Snap-dragon with a large snowy flower.

6. ANTIRRHINUM foliis linearibus floribus petiolatis axillaribus. Sicilian Snap-dragon with a Toad-flax leaf and a snow white flower.

The two first sorts grow naturally on arable land in many parts of *England*, so are seldom admitted into gardens; these are both annual plants, which come up from scattered seeds. They flower in *June and July*, and their seeds are ripe in *September*.

The third sort is not a native of *England*, but having been first brought into gardens, the seeds have scattered about in so great plenty, that it is become very common upon walls and old buildings in many parts of *England*. Of this sort there are several varieties, which differ in the colour of their

flowers, some having red flowers with white mouths, some with yellow mouths, others have white flowers, with yellow and white mouths. There is also one with striped leaves. The last is propagated by slips and cuttings, which readily take root any time in the spring or summer. The different colours of the flowers are variable from seeds.

The fourth sort grows naturally in the islands of the *Archipelago*. The leaves of this are much broader, the flowers greatly larger, and the spikes longer, than in any of the other sorts. The colours of the flowers are as changeable in this sort as the former, when raised from seeds; but as this is the most specious kind, so it better deserves propagating than the common sort, especially as it is equally hardy.

The fifth sort hath long narrow leaves, which are hairy; the flowers are large, and the spike is shorter than the former.

The sixth sort is an annual plant, which seldom grows more than a foot high; the leaves of this are very narrow and smooth; the flowers come out from the wings of the leaves single, standing on long foot-stalks; these are very white, with a dark bottom.

The third, fourth, and fifth sorts are raised from seeds, which should be sown in a dry soil, which is not too rich, either in *April* or *May*; and in *July* the plants may be planted out into large borders, where they will flower the spring following; or they may be sown early in the spring, for flowering the same autumn, but then they are not so likely to endure the winter; and if the autumn prove bad, they will not perfect their seeds.

These plants grow extremely well upon old walls or buildings, in which places they will endure for several years; whereas those planted in gardens seldom last longer than two years, unless they are planted in a very poor soil, and the flowers often cropped, and not suffered to seed; but any of these sorts may be continued, by planting cuttings in any of the summer months, which will easily take root.

Wherever these plants are designed to grow on walls, or on a rocky barren soil, the seeds should be sown the beginning of *March*, where they are designed to remain; for if the plants are first raised in a better soil, and afterward transplanted into those places, they seldom succeed well.

APARINE, Goose-grass, or Clivers.

There are three or four sorts of this which are preserved in botanick gardens for variety, but are not worthy of a place in other gardens.

APHACA, Vetchling.

The Characters are,

The flower is of the butterfly kind; the standard being large and heart-shaped, the wings are shorter and obtuse; the keel is the length of the wings, and divided slightly in the middle. The germin, which is situated in the center; afterward becomes a short pod, containing two or three round seeds.

We have but one Species of this plant, viz.

APHACA *Lob. Icon.* 70. Yellow Vetchling.

This plant is found wild in divers parts of *England*, on arable land, but is seldom preserved in gardens. It is an annual plant, which perishes soon after the seeds are perfected. The surest method to cultivate this plant, is to sow the seeds on a bed of light earth in autumn, soon after they are ripe; for if they are kept out of the ground until spring, they seldom grow; and if some of the plants come up at that season, they seldom perfect their seeds so well as those which were sown in autumn. These seeds should be sown where the plants are designed to remain, for they seldom succeed well if they are transplanted. All the culture these plants require, is to keep them clear from weeds, and to thin them where they come up too close, leaving them about ten inches or a foot asunder.

APIOS. See Glycine.

APIUM, Parsley.

The Characters are,

It is a plant with an umbelliferous flower; each flower has five stamina. Under the flower is situated the germen, which afterward becomes an oval channelled fruit, dividing into two parts, having two oval seeds channelled on one side, and plain on the other.

The Species are,

1. APIUM *foliolis caulinis linearibus.* Hort. Cliff. 108. Common Parsley.

2. APIUM *foliis radicalibus amplioribus crispis caulinis ovato-multifidis.* Curled Parsley.

3. APIUM *foliis radicalibus trifidis, serratis petiolis longissimis.* The large rooted Parsley.

4. APIUM *foliolis caulinis cuneiformibus.* Hort. Cliff. 107. Smalage or Water Parsley.

5. APIUM *foliis erectis, petiolis longissimis foliolis quinque lobatis serratis.* Upright Celery.

6. APIUM *foliis patulis, petiolis brevibus, foliolis quinque serratis, radice rapacea.* Celeriack or Turnep-rooted Celery.

The first sort is the common Parsley, which is generally cultivated for culinary use; and is what the *College of Physicians* have directed to be used in medicine, under the title of *Petroselinum*; for when *Apium* is prescribed, the Smalage is always intended.

The second sort may be constantly preserved, if the seeds are carefully saved from plants, whose leaves are well curled, the seeds will produce the same; but there are few persons who will be at the trouble to save the seeds so carefully, as not to have some of the common sort mixed with it: therefore the only method to have it good, is to separate all those plants which have plain leaves from the curled, as soon as they are distinguishable, leaving only such as are of the right kind. It will be a very safe method for such persons, who cannot well distinguish the common Parsley from the lesser Hemlock, to sow the seeds of this curled leaved Parsley, which is easily known at first sight from Hemlock; for where the latter has been used by mistake, it has been attended with bad consequences.

The third sort is chiefly cultivated for their roots, which are now pretty commonly sold in the *London* markets; the leaves of this sort have much longer foot-stalks, and the subdivisions of these are not so numerous as in the common Parsley; the lobes of the leaves are much larger, and of a darker green, so that it is easily distinguished from the common sort by its leaves, but the roots are six times as large as the common Parsley can be brought to with the utmost culture. This sort was many years cultivated in *Holland*, before the *English* gardeners could be prevailed on to sow it. I brought the seeds of it from thence in 1727, and would then have persuaded some of the kitchen gardeners to make trial of it, but they refused to accept of it, so that I cultivated it several years before it was known in the markets.

The fourth sort is commonly known by the title of Smalage. This is what the physicians intend when they prescribe *Apium*. This plant grows naturally by the sides of brooks and ditches in many parts of *England*, so is rarely cultivated in gardens.

The fifth sort is the common Celery, and the sixth sort was supposed to be a degenerate species from it, but I cannot agree to this opinion; for from many years trial, I have never found it vary. The leaves of this sort are short, when compared with those of the other, and spread open horizontally, and the roots grow as large as common Turneps. All the difference which I have observed to arise from culture, has been only in the size of the roots; those on rich ground, which were properly cultivated, were much larger than those on poorer land, but the leaves and outward appearance of the

the plants were never altered, so that I make no doubt of its being a different species.

The common Parsley should be sown early in the spring; for the seeds remain a long time in the earth, the plants seldom appearing in less than six weeks after the seeds are sown. This sort is generally sown in drills by the edges of borders in the kitchen gardens near *London*, because it is much easier to keep it clear from weeds, than if the seeds are sown promiscuously on a border, and the Parsley is much sooner cut for use: but when the roots are desired for medicinal use, then the seeds must be sown thin; and when the plants are come up, they should be hoed out single, as is practised for Carrots, Onions, &c. observing also to cut up the weeds: if this be observed, the roots will become fit for use by *July* or *August*.

The common Parsley is, by some skilful persons, cultivated in fields for the use of sheep, it being a sovereign remedy to preserve them from the rot, provided they are fed twice a week for two or three hours each time with this herb; but hares and rabbits are so fond of it, that they will come from a great distance to feed upon it; and in countries where these animals abound, they will destroy it, if it is not very securely fenced against them; so that whoever has a mind to have plenty of hares in their fields, by cultivating Parsley, will draw all the hares of the country to them.

The best time for sowing it in the fields is about the middle or latter end of *February*; the ground should be made fine, and the seeds sown pretty thick, in drills drawn at about a foot asunder, that the ground may be kept hoed between the drills, to destroy the weeds, which, if permitted to grow, will soon over-run the Parsley. Two bushels of seed will sow one acre of land.

The great Garden Parsley is now more known to us in *England*, than it was some years ago: in *Holland* it has been long very common in all their markets: they bring these roots in bunches, as we do young Carrots, to market, in summer; and the roots are much of the same size: it is called *Petroseline Wortle* by the *Dutch*, who are very fond of it for *Water Souche*.

It may be cultivated by sowing the seeds in good ground early in the spring; and in *April*, when the plants are up, cut them out with a hoe (as is practised for young Carrots) to about five or six inches square, and keep them constantly clean from weeds, and in *July* the roots will be fit to draw for use, and may be boiled and eaten as young Carrots; and are very palatable and wholesome, especially for those who are troubled with the gravel.

But where these plants are cut out, to allow them more room, if the soil is good, the roots will grow to the size of a middling Parsnep, by *September*; and the roots may be preserved for use all the following winter, in the same manner as Carrots.

The seeds of the two sorts of Celery should be sown at two or three different times, the better to continue it for use through the whole season without running up to seed. The first sowing should be in the beginning of *March*, upon a gentle hot-bed; the second may be at the end of the same month, which ought to be in an open spot of light earth, where it may enjoy the benefit of the sun; the third time of sowing should be the latter end of *April*, or beginning of *May*, on a moist soil; and if exposed to the morning sun only, it will be so much the better; but it should not be under the drip of trees.

The seeds which are sown on the hot-bed will come up in about three weeks or a month after sowing, when you must carefully clear it from weeds; and if the season prove dry, you must frequently water it; and in about five or six weeks after it is up, the plants will be fit to transplant: you must therefore prepare some beds of moist rich earth, in a

warm situation, in which you should prick these young plants, at about three inches square, that they may grow strong; and if the season should prove cold, the beds must be covered with mats, to screen the plants from morning frosts, which would retard their growth: you must also observe, in drawing these plants out of the seed-beds, to thin them where they grow too thick, leaving the small plants to get more strength before they are transplanted, by which means one and the same seed-bed will afford three different plantings, which will accordingly succeed each other for use.

The middle of *May* some of the plants of the first sowing will be fit to transplant for blanching; which should be planted in a moist rich light soil, upon which this first planted Celery will often grow to be twenty inches long in the clean blanched parts, which upon a poor or dry soil seldom rises to be ten inches.

The manner of transplanting it is as follows: After having cleared the ground of weeds, you must dig a trench by a line about ten inches wide, and eight or nine inches deep, loosening the earth in the bottom, and laying it level; and the earth that comes out of the trench should be equally laid on each side the trench, to be ready to draw in again to earth the Celery as it advances in height. These trenches should be made at three feet distance from each other; then plant your plants in the middle of the trench, at about four or five inches distance, in one strait row, having before trimmed the plants, and cut off the tops of the long leaves; and as they are planted, you must observe to close the earth well to their roots with your feet, and to water them plentifully until they have taken new root. As these plants advance in height, you must observe to draw the earth on each side close to them, being careful not to bury their hearts, nor ever to do it but in dry weather, otherwise the plants will rot.

When your plants have advanced a considerable height above the trenches, and all the earth, which was laid on the sides thereof, hath been employed in earthing them up; you must then make use of a spade to dig up the earth between the trenches, which must also be made use of for the same purpose, continuing from time to time to earth it up, until it is fit for use.

The first of your planting out will, perhaps, be fit for use by the end of *July*, and will be succeeded by the after plantations; and if the latter sowings are rightly managed, there will be a succession of it till *April*; but you should observe, to plant the last crop in a drier soil, to prevent its being rotted with too much wet in winter; you will do well to cover your ridges of Celery with some Pease-haulm, or some such light covering, when the frost is very hard, which will admit the air to the plants; for if they are covered too close, they will be very subject to rot; by this means you will preserve your Celery till spring; but you must remember to take off the covering whenever the weather will permit, otherwise it will be apt to cause the Celery to pipe, and run to seed. By this method of covering the Celery, the frost will be kept out of the ground, so it may be always taken up for use when it is wanted; which, if neglected, it cannot be taken up in hard frost. The Celery, when fully blanched, will not continue good above three weeks or a month before it will rot or pipe: therefore, in order to continue it good, you should have, at least, six or seven different seasons of planting; so that if it be only intended to supply a family, there need not be much planted at each time; but this must be proportioned according to the quantity required.

The other sort of Celery, which is commonly called *Celeriac*, is to be managed in the same manner as is directed for the *Italian Celery*, excepting that this should be planted upon the level ground, or in very shallow drills; for this plant seldom grows above eight or ten inches high, so requires but little earthing up; the great excellency of this being in

the size of the root, which is often as large as ordinary Turneps. It should be sown about the end of *March*, or beginning of *April*, upon a rich border of earth; and, in dry weather, constantly watered, otherwise the seeds will not grow: when the plants are large enough to transplant out, they should be placed eighteen inches asunder, row from row, and the plants six or eight inches distant in the rows; the ground must be carefully kept clean from weeds; but this sort will require only one earthing up, which should not be performed until the roots are nearly grown to their size: both these sorts of Celery delight in a rich light moist soil, where they will grow to a much larger size, and will be sweeter and tenderer than on a poor or dry ground.

The best method to save this seed, is to make choice of some long good roots of the upright Celery, which have not been too much blanched, and plant them out at about a foot asunder in a moist soil, early in the spring; and when they run up to seed, keep them supported with stakes, to prevent their being broken down with the wind: and in *July*, when this seed begins to be formed, if the season should prove very dry, it will be proper to give some water to the plants, which will greatly help its producing good seeds. In *August* these seeds will be ripe, at which time it should be cut up, in a dry time, and spread upon cloths in the sun to dry; then beat out the seeds, and preserve it dry in bags for use.

APIUM MACEDONICUM. See Bubon.

APIUM ANISUM DICTUM. See Pimpinella.

APIUM PYRENAICUM. See Crithmum.

APOCYNUM. *Tourn. Inst. R. H. 91; Lin. Gen. Plant.* 269. Dogsbane.

The Characters are,

The flower is of one leaf, cut into five acute segments at the top, which turn backward; in the bottom of the flower are situated five nectariums, which surround the germen: there are five stamina, scarce visible. In the center are two oval germen, which afterward become two large pointed capsules, having one cell, which is filled with compressed seeds, lying over each other like tiles on a house, and furnished with long feathery down.

The Species are,

1. APOCYNUM caule rectiusculo herbaceo foliis ovatis utrinque glabris cymis terminalibus. *Lin. Sp. Plant.* 213. Canada Dogsbane with greater Tutfan leaves.

2. APOCYNUM caule rectiusculo herbaceo foliis oblongis cymis lateralibus. *Lin. Sp. Plant.* 213. Greatest Canada Dogsbane with the least herbaceous flower.

3. APOCYNUM caule rectiusculo herbaceo foliis ovato lanceolatis. *Prod. Leyd.* 411. Venetian maritime Dogsbane with a Willow leaf and a purple flower.

4. APOCYNUM foliis ovatis petiolatis, superne glabris, floribus amplis pediculis longis hirsutis caule fruticoso. Shrubby upright Dogsbane with a very large and beautiful yellow flower.

5. APOCYNUM foliis oblongo-cordatis rigidis floribus lateralibus, caule fruticoso volubili. Climbing Dogsbane with a Citron leaf and spotted pods.

6. APOCYNUM caule erecto frutescente foliis lanceolato-ovalibus corollis acutis fauce villosis. *Flor. Zeyl.* 114. Dogsbane with an upright woody stalk, and oval pointed leaves.

7. APOCYNUM caule volubili perenne foliis ovatis venosis. *Prod. Leyd.* 412. Dogsbane with a perennial twining stalk, and oval veined leaves.

8. APOCYNUM caule volubili foliis ovatis rigidis obliquis cymis lateralibus tubo floris longissimo. Greater climbing Dogsbane with roundish leaves.

9. APOCYNUM caule fruticoso scandente foliis ovatis nervosis cymis lateralibus flore luteo magno tubo longissimo. Dogsbane with a climbing shrubby stalk, oval veined leaves; the flowers growing in bunches from the sides of the stalks, and a large yellow flower with a very long tube.

10. APOCYNUM foliis oblongo-cordatis, mucronatis sessilibus floribus lateralibus, caule scandente. Climbing Dogsbane with oblong pointed leaves, and large yellow open flowers.

11. APOCYNUM foliis cordatis glabris floribus villosis lateralibus petiolis longioribus caule scandente. Climbing Dogsbane with large yellow hairy flowers, and swelling angular pods, which are smooth.

The first sort grows naturally in *North America*. This hath an annual stalk, and a perennial root; the stalks rise about three feet, grow upright, and are garnished with smooth oval leaves, growing opposite. These, as also the stalks, abound with a milky juice, which flows out when they are broken; the flowers are collected in a kind of umbel, growing at the top of the stalks. These are white, and the nectariums in the bottom, have a purplish cast; these are seldom succeeded by pods in *England*, but the plant is propagated by parting of the roots. It is hardy, so will thrive in the full ground, but the soil should be light or dry, otherwise the roots are apt to rot in winter. The best time to part the roots is in *March*, before they begin to put out new stalks.

The second sort is a native of the same countries; the roots of this sort creep far in the ground, so that when it is planted in a garden, it is apt to spread so much, as to be troublesome. The stalks of this sort grow about two feet high, are red, and have oblong smooth leaves, set on by pairs opposite. Towards the upper part of the stalk, the flowers come out from the wings of the leaves, collected in small bunches, which are of an herbaceous white colour, and very small, so make no great appearance. This is very hardy, and propagates too fast by its creeping roots. Both these sorts flower in *July*, and in autumn their stalks decay to the root.

The third sort grows upon a small island in the sea, near *Venice*, but is supposed to have been originally brought from some other country. The roots of this creep pretty much, by which it is propagated, for it never produces any seeds either in the gardens where it is cultivated, or at *Venice* where it grows without care, as I have been informed by a very curious botanist, who resided many years at *Venice*, and constantly went to the spot several times in the season, to procure the seeds, if there had been any produced; but he assured me, he never could find any pods formed on the plants. The stalks of this sort decay in autumn, and new ones are sent out from the roots in the spring. The flowers grow at the top of the stalks in small umbels, which are shaped like those of the former sorts, but are much larger, so make a pretty appearance; it flowers in *July* and *August*. The best time to remove and part the roots is in the spring, just before they begin to push out new stalks.

The fourth sort grows naturally in *Jamaica*, in the *Savannas*, from whence it had the title of *Savanna* flower, by which it is chiefly known in that island. This rises three or four feet high, having woody stalks, which send out a few lateral branches, which are garnished with oval leaves, placed by pairs opposite; they are smooth, and of a shining green colour on their upper sides, but are pale, and veined underneath; the flowers are produced from the side of the branches, upon long foot-stalks; they are very large, having a long tube, which spreads open very wide at the top, and are of a bright yellow, so make a fine appearance in the places where the plants grow naturally, being most part of the year in flower. This plant is too tender to thrive in *England* without the assistance of a stove. It is propagated by seeds, which must be procured from *Jamaica*. When the seeds are obtained, they should be sown in pots filled with light sandy earth, and plunged into a hot-bed of tanners bark. If the seeds are good, the plants will appear in a month or five weeks after, when they should be treated in

the same manner as other tender plants from the same country, with this difference only, to be sparing in watering them; for these plants which abound with a milky juice, require very little wet, being soon destroyed by moisture. They should be constantly kept in the tan bed in the stove: there must be great care not to over pot them, for unless their roots are confined, the plants will not thrive. The second year the plants will flower, if they have been skilfully managed, when they will make a fine appearance in the stove: the usual time of their flowering in *England*, is in *July* and *August*.

The fifth sort was discovered by father *Plumier*, in some of the *French* islands in *America*, who made a drawing of the plant. It was afterwards found by the late Mr. *Robert Millar*, surgeon, growing plentifully near *Carthagena*, in *New Spain*. It hath twining stalks, by which it mounts to the tops of very tall trees; and stiff, oblong, heart-shaped leaves, which are smooth, of a shining green colour. The flowers are produced in small clusters from the side of the branches, and are of an herbaceous colour, so do not make any great appearance.

The sixth sort grows naturally in *India*, *Ceylon*, and upon the coast of *Guinea*. This plant rises with a woody stem to the height of five or six feet, garnished with oblong pointed leaves, very smooth, and of a shining green above, but pale underneath. From the wings of the leaves the flowers are produced in loose bunches. These are small, tubulous, and of a purple colour. It is a very tender plant, so must be constantly kept in a hot house, and plunged in the tan bed, otherwise it will not thrive in *England*. This plant must be sparingly watered, especially in winter, and should be planted in light sandy earth.

The seventh sort grows naturally in *India*. This plant hath a twining stalk, by which it rises to a considerable height, and is garnished with oblong leaves, which are much veined. It is tender, so requires to be constantly preserved in the stove, otherwise it will not thrive in this country.

The eighth sort grows naturally in *Jamaica*. This hath a climbing stalk, by which it fastens to the neighbouring trees, and rises ten or twelve feet high. The leaves are oval, stiff, and oblique to the foot-stalk; the flowers are of a purplish colour, and have very long tubes, but spread open wide at the top. It is tender, so must constantly remain in the stove, and should have very little water.

The ninth sort hath a climbing woolly stalk, and rises to a considerable height, by the support of neighbouring trees. The leaves grow by pairs opposite; the flowers come out from the wings of the leaves, each standing upon a separate long foot-stalk; they are large, and of a bright yellow colour, with very long tubes, and spread open wide at the top; they are succeeded by long compressed pods, which have borders on one side, and are filled with long channelled seeds, which are crowned with long plumes of soft down. This is propagated by seeds, which must be procured from the country where it grows naturally, for the seeds do not ripen in this country; and the plants should be treated in the same manner, as hath been before directed for the fourth sort. It flowers in *August* and *September*, in *England*.

The tenth and eleventh sorts were discovered at *La Vera Cruz*, in *New Spain*, by the late Dr. *William Houfoun*. These plants have both climbing stalks, by which they mount to the tops of the tallest trees, where they grow naturally. The tenth sort has produced flowers in *England* several times; but the eleventh, which grows more luxuriantly than the other, never had any appearance of flowers. These are both propagated by seeds, which should be sown as the fourth sort, and the plants must be treated in the same manner afterward. The pods of all the sorts are filled with seeds, which are, for the most part compressed, and lie over each

other (*imbricatum*) like tiles on a house: these have each a long plume of a cottony down fastened to their crowns, by which, when the pods are ripe and open, the seeds are wafted by the wind to a considerable distance; so that in the countries where these plants naturally grow, they are some of the most troublesome weeds.

The down of these plants is in great esteem in *France*, for stuffing of easy chairs, making very light quilts, which are warm, and extremely light, so are very proper covering for persons afflicted with the gout; for the down is so extreme light and elastick, that it occasions no weight. This the *French* call *Delawad*, and in the southern parts of *France*, where some of the sorts will thrive in the open air, and perfect their seeds, there are many plantations made of these plants for the sake of the down.

The other sorts, which have been ranged under this genus, are now referred to the following genera, to which the reader is desired to turn, for such of them as are not here enumerated, *viz.* *Asclepias*, *Cynanchum*, and *Periploca*.

APPLE TREE. See *Malus*.

APPLES of LOVE. See *Lycopersicon* and *Solanum*.

MAD APPLES. See *Melongena*.

APRICOT, or ABRICOT; or, in *Latin*, *Malus Armeniaca*. See *Armeniaca*.

AQUIFOLIUM. See *Ilex*.

AQUILEGIA, Columbine.

The Characters are,

The flower hath no empalement, but is composed of five equal oval petals, which are plain, and spread open within, and have five equal nectariums, ranged alternately with the petals, each of the horns widening upward. It hath many awl-shaped stamina, and five oval germen, which afterward become five cylindrical vessels, which are filled with oval shining seeds.

The Species are,

1. AQUILEGIA nectariis rectis petalo lanceolato brevioribus. *Lin. Sp. Pl.* 533. Wild Columbine.

2. AQUILEGIA nectariis rectis, petalis ovatis longioribus. Mountain Columbine with a large flower.

3. AQUILEGIA nectariis incurvis. *Hort. Upsal.* Columbine with a double inverted flower.

4. AQUILEGIA nectariis rectis staminibus corollâ longioribus. *Hort. Upsal.* 153. Early dwarf Canada Columbine.

The first sort is found growing wild in the woods in some parts of *England*. I have frequently gathered it in the woods near *Bexley* in *Kent*, and also between *Maidstone* and *Rockefeller*. The flowers of this are blue, and the petals are short. The second sort I found growing naturally near *Ingleborough Hill*, in *Yorkshire*. The flowers of this are much larger than those of the Garden Columbine, and the seeds which I sowed of this in the garden at *Chelsea*, produced the same species without the least variation.

The third is the Garden Columbine, of which there are great varieties, not only in the colour and fulness of their flowers, but also in their form. In some there are no visible nectariums, but in place of them a multiplicity of petals, so that the flowers are as double as those of the Larkspur. These are commonly called Rose Columbines; the colours of these are Chestnut, blue, red, and white, and some are finely variegated with two colours.

There are others with sharp pointed petals, which expand in form of a star; of these there are single and double flowers, of the several colours as the former. But as the sorts with variegated flowers are the greatest beauties, so those persons, who are desirous to have them in perfection, should root out all those plants whose flowers are not well marked, or cut off their stems so soon as their flowers appear, leaving only the most beautiful to seed.

They are all raised by sowing the seeds, or parting the old roots, but the former method is chiefly practised; for the old

roots are very apt to degenerate after they have blown two or three years, and become quite plain.

The seeds should be sown in a nursery bed in *September*, for the seeds which are kept till spring seldom grow well, or at least remain in the ground a whole year. In the spring following your young plants will appear above ground, you must therefore clear them from weeds, and if the season should be dry, refresh them with water, that they may gather strength.

In the middle or latter end of *May*, these plants will be strong enough to transplant; you must therefore prepare some beds of good fresh undunged earth, planting them therein at eight or nine inches distance every way, keeping them clear from weeds.

At *Michaelmas* you may remove them into the borders of your flower garden, and the *May* following they will produce flowers; but if you intend to maintain their roots, you should not suffer them to seed, but crop off all their flower-stems as soon as the flowers are past.

In order to keep up a succession of good flowers, you should sow fresh seeds every year; and if you can meet with a friend, at some distance, who is furnished with good flowers of this kind, it will be very advantageous to both parties, to exchange seeds once in two years, by which means they will not be so apt to degenerate into plain colours.

The *Canada* Columbine flowers almost a month before the other sorts; for which reason it is preserved in the gardens of the curious, though there is no very great beauty in the flowers. There is another variety of this sort, with taller flower-stems, which flowers a little after the other, but doth not differ, either in the shape of its flowers or leaves from this.

The first sort is that which is directed for medicinal use in the Dispensaries, but at present is very rarely ordered.

ARABIS. *Lin. Gen. Pl.* 732. Bastard Tower Mustard.

The Characters are,

The flower hath four petals in form of a cross, which spread open; at the bottom of which is situated a reflexed nectarium; between these arise six upright stamina. In the center is situated a taper germen, which afterward becomes a narrow long compressed pod, having two valves and a thin partition, between which is lodged a row of flat seeds.

The Species are,

1. ARABIS foliis petiolatis lanceolatis integerrimis. *Vir. Cliff.* 64. Bastard Tower Mustard, with whole spear-shaped leaves having foot-stalks.

2. ARABIS foliis amplexicaulibus dentatis. *Hort. Cliff.* 335. Bastard Tower Mustard, with indented leaves embracing the stalks.

3. ARABIS foliis amplexicaulibus siliquis ancipitibus linearibus calycibus subpilosis. *Hort. Upsal.* 191. Broad-leaved hairy Tower Mustard, with hanging pods.

4. ARABIS foliis amplexicaulibus siliquis decurvis planis linearibus, calycibus subrugosis. *Hort. Upsal.* 192. Bastard Tower Mustard, with narrow plain hanging pods and rough flower cups.

The first sort is a low plant, which seldom rises more than four or five inches high, branching on every side; having small white flowers growing alternately, which have each four petals in form of a cross, that are succeeded by long slender pods, filled with small round seeds. It grows naturally on sandy dry ground, in many parts of *England*.

The second sort grows naturally in *Istria*, and also upon the *Alps*, and other mountainous countries. It is a perennial plant, which increases very fast by its creeping roots, which run obliquely near the surface of the ground, and send down roots at every joint. The leaves are whitish, and indented on their edges; the flower-stalks grow near a foot high, and are garnished with leaves placed alternately, which

closely embrace the stalks: the flowers grow in loose bunches on the top; these are white, and have leaves in form of a cross, which are succeeded by long flat pods, opening lengthways.

This is a very hardy plant, so will thrive in any situation. It produces seeds in plenty, but as it multiplies so fast by its creeping roots, so few persons are at the trouble to sow the seeds. It flowers early in the spring.

The third sort grows naturally in *Siberia*. This is a perennial plant, which grows near a foot high; the leaves are broad, hairy, and indented on their edges. The flowers grow alternately in loose spikes, and are of a dirty white colour. These are succeeded by long narrow pods, which are filled with flat brown seeds. This is a biennial plant, which is very hardy, so will thrive in any situation.

The fourth sort grows naturally in *Hungary*, *Sicily*, and *France*, as also upon some old walls at *Cambridge* and *Ely*, but the seeds might probably come out of the gardens where they were first planted. The plants of this kind, which grow on walls or ruins, continue much longer than those which are sown in gardens, where they seldom live longer than two years; the stalks rise about a foot and an half high. Toward the top of the stalks grow long loose spikes of flowers, which are of a dirty white colour. After the flowers are past, the germen become long flat pods, which open lengthways, and have two rows of flat bordered seeds of a dark brown colour.

This sort is easily propagated by seed, which should be sown in the autumn. When the plants are strong enough to remove, they may be transplanted into a shady border, or in rural plantations, where no other care will be necessary, but to prevent their being overgrown by weeds.

ARACHIS, Earth, or Ground Nut.

The Characters are,

The empalement of the flower opens in two parts. The flower is of the butterfly kind; it hath ten stamina, nine of which coalesce, and the upper one stands off. In the center is situated an oblong germen, which afterward turns to an oblong pod, containing two or three oblong blunt seeds.

We have but one Species of this plant, viz.

ARACHIS. *Lin. Hort. Cliff.* 353. Earth, or Ground Nut.

The native country of this plant I believe is *Africa*, though at present, all the settlements in *America* abound with it; but many persons who have resided in that country affirm, they were originally brought by the slaves from *Africa*.

It multiplies very fast in a warm country, but being impatient of cold, it cannot be propagated in the open air in *England*; therefore, whoever has an inclination to cultivate this plant, must plant the seeds in a hot-bed in the spring of the year; and when the weather proves warm, they may be exposed to the open air by degrees. The branches of this plant trail upon the ground, and the flowers (which are yellow) are produced single upon long foot stalks; and as soon as the flower begins to decay, the germen is thrust under ground, where the pod is formed and ripened; so that unless the ground is opened, they never appear: the roots of this plant are annual, but the nuts or seeds sufficiently stock the ground in a warm country, where they are not very carefully taken up.

ARALIA, Berry-bearing Angelica.

The Characters are,

It is an umbelliferous plant with a globular umbel, having a small involucre; the flower hath five oval petals, and five short styles. The germen afterward turns to a roundish channelled berry, having five cells, each containing one oblong hard seed.

The Species are,

1. ARALIA caule folioso herbaceo laevi. *Hort. Upsal.* 70. *Canada* Berry-bearing Angelica.

2. *ARALIA caule nudo*. Hort. Cliff. 113. Berry-bearing Angelica with a naked stalk.

3. *ARALIA arborescens caule foliolisque aculeata*. Vir. Cliff. 26. Angelica Tree, vulgò.

The first sort is pretty common in many gardens near London, but the second is at present more rarely met with. Both these plants grow naturally in North America. They are perennial plants, whose stalks decay in autumn, and new ones arise from their roots in the spring. The first grows about four or five feet high, and divides into many irregular branches, having ramose leaves, placed alternately; at the wings of these the flower-stalks are produced, which are terminated by round umbels of small flowers, of a whitish colour; these are succeeded by round channelled berries, which when ripe, are black. This plant flowers in June, and the seeds ripen in October.

The second sort rises to near the same height as the former; the leaves of this divide into two or three parts, each ending with three or five large lobes, which are sawed on their edges. The flower-stalks arise between these immediately from the root, being naked, and are terminated by round umbels of flowers, in shape and colour like the first, but the berries are smaller. This flowers toward the end of June, and the seeds ripen late in the autumn.

Both these sorts are easily propagated by seeds, which are generally produced in plenty. These should be sown in the autumn soon after they are ripe. When the plants appear, they must be kept clean from weeds during the summer; and in the autumn following, when their leaves decay, the roots may be taken up, and transplanted where they are to remain. They are very hardy plants, so may be planted in any situation; and as they grow naturally in woods, so they may be planted in wilderness quarters, under trees.

The third sort rises with a woody stem to the height of eight or ten feet, dividing into several branches; these are garnished with branching leaves, which are compounded of many divaricated wings; the ribs of the leaves, as also the branches and stems of the plants, are armed with strong crooked spines, which render the places very difficult to pass through where they grow in plenty. The flowers of this sort are produced in large loose umbels, at the extremity of the branches, and are of an herbaceous colour, so make no great figure, but the plants are preserved in most of the curious gardens in England. It flowers in August, but the seeds do not ripen in this country.

This is propagated by seeds, which are easily procured from North America; but as they seldom arrive here till toward the spring, so the plants never come up the first year, but the following spring. When the plants come up, they should be frequently refreshed with water, and constantly kept clean from weeds, and in summer they should be inured to the open air. These plants should not be disturbed the first season; but as they are often injured by frost when young, so in the first winter the plants should be screened from hard frosts, but in mild weather should be constantly opened to enjoy the free air. The leaves of these plants fall away in the autumn. In the spring, before the plants begin to push, they should be transplanted; a few of them should be planted singly into small pots, and the others may be planted in a bed of light earth in a warm situation. If those which are planted in the small pots are plunged in a moderate hot-bed, it will greatly forward their growth; but they must be early inured to bear the open air, otherwise they will draw up weak, and the spring following they may be planted where they are designed to remain. As these plants do not come out very early in the spring, so they often continue growing pretty late in the autumn, which causes the extreme parts of their shoots to be very tender, whereby they often suffer from the early

frosts in autumn, which frequently kill the upper parts of the shoots; but as their woody stems are seldom injured, so they put out new branches below: and if in very severe winters the stems are destroyed, yet the roots will remain, and put out new ones the following summer, therefore they should not be destroyed.

This plant may also be propagated by its roots, for as they spread far in the ground, so they will put out young plants at a distance from the stems, which may be taken off before they begin to shoot in the spring.

ARBOR CAMPHORIFERA. See Laurus.

ARBOR CORAL. See Erythrina.

ARBOR JUDÆ See Cercis.

ARBUTUS, the Strawberry tree.

The Characters are,

The flower hath a small obtuse empalement, which is cut into five parts, upon which the germen sits! The flower is of one leaf, shaped like a pitcher; at the bottom of the flower is situated the globular germen, which afterward becomes an oval or round berry, having five cells, which are filled with hard seeds.

The Species are,

1. *ARBUTUS foliis glabris serratis, baccis polyspermis, caule erecto arboreo*. The common Strawberry tree.

2. *ARBUTUS foliis glabris integerrimis, baccis polyspermis caule erecto arboreo*. The Oriental Strawberry tree, called Adrachne.

3. *ARBUTUS caulibus procumbentibus foliis ovatis subserratis floribus sparsis baccis polyspermis*. Lin. Sp Pl. 395. Arbutus with trailing stalks, oval leaves somewhat indented, flowers growing loosely, and many seeds.

4. *ARBUTUS caulibus procumbentibus foliis rugosis serratis*. Flor. Lap. 161. Arbutus with trailing stalks and rough sawed leaves.

5. *ARBUTUS caulibus procumbentibus foliis integerrimis*. Flor. Lat. 162. Arbutus with trailing stalks and entire leaves; called Uva ursi, or Bearberries.

The first sort grows naturally in Italy, Spain, and also in Ireland; and is now very common in the English gardens. Of this sort there are the following varieties, viz. one with an oblong flower and oval fruit; another with a double flower, and a third with red flowers; but these being only feminal varieties, I have not mentioned them as species.

The second sort grows naturally in the East, particularly about Magnesia, where it is so plenty, as to be the principal fuel used by the inhabitants of the country. The leaves are large and oval, somewhat like those of the Bay tree, but not quite so long; they are smooth and entire, having no serratures on their edges; the flowers are shaped like those of the common Arbutus, but grow thinly on their branches. The fruit is oval, and of the same colour and consistence with the common sort, but the seeds of this are flat, whereas those of the common sort are pointed and angular.

The common Strawberry tree is one of the greatest ornaments in the months of October, November, and frequently great part of December; that being the season when the trees are in flower, and the fruit of the former year is ripe, for the fruit is a whole year growing to perfection; so that the fruit which is produced from the flowers of one year, do not ripen till the blossoms for the succeeding year are fully blown; so they make a goodly appearance, and at a season when most other trees are past their beauty.

The sort with double flowers is a curiosity, but as the flowers have only two rows of leaves, so they make no great appearance; nor do the trees produce fruit in any plenty, therefore the other is more preferable. The sort with red flowers makes a pretty variety, when intermixed with the other; for the outside of the flowers are of a fine red colour at their first appearance, and afterward they change to purple before they fall off. These varieties are preserved by inarching

inarching or grafting them upon the common Arbutus, for the seeds of either do not produce the same kind.

The best method to propagate the Arbutus is from seeds; therefore when the fruit is perfectly ripe, it should be gathered and mixed with dry sand, to preserve them till the middle or latter end of *March*, which is a proper season for sowing of them, in order to have strong plants before winter; they must be sown in pots, which should be plunged into a moderate hot-bed, which will greatly forward their vegetation; and, if they are properly managed, will grow eight or ten inches high before winter. In the summer, if the pots are plunged into an old tan bed, it will preserve the earth in the pots from drying too fast; and if the plants are screened from the sun in the heat of the day, it will greatly forward them. The beginning of *October*, these plants may be shaken out of the pots, and their roots carefully separated, planting them singly in small pots filled with light earth; then plunge the pots into an old bed of tanners bark, under a common frame, where they should remain during the winter, observing to expose the plants to the open air, at all times when the weather is favourable, but in frosty weather they must be covered. The spring following, they may be plunged into the ground, in a sheltered situation, observing to water them frequently in dry weather, which will keep them growing all the summer: but it will be advisable to screen them from the frost the following winter, by covering them with mats in bad weather.

The following spring you may shake them out of the pots into the open ground in the places where they are to remain, that they may have taken good root before the winter.

These trees are tolerably hardy, and are seldom hurt, except in extreme hard winters, which many times kill the young and tender branches, but rarely destroy the trees; therefore, however dead the trees may appear after a hard winter, yet they should be suffered to remain till the succeeding summer has sufficiently demonstrated what are living and what are dead; for the winters *Anno 1728-9*, and *1739-40*, gave us great reason to believe most of the trees of this kind were destroyed; and many people were so hasty, as to dig up or cut down, many of their trees; whereas all those people who had patience to let them remain, found that scarce any of them failed to come out again the next summer, and made handsome plants that season.

The very best season for transplanting of the Arbutus is in *September*, at which time the blossoms are beginning to appear; and at that season, if it should prove very dry and they are kept moist, they will take root very soon; but toward the beginning of *November*, their roots should be well covered with mulch, to keep out the frost.

The third sort grows naturally in *Acadia*, and other northern parts of *America*, upon swampy land, which is frequently overflowed with water; this is a low bushy shrub, with slender trailing branches, which are garnished with oval leaves, a little sawed on their edges; the flowers come out from the wings of the leaves, growing in thin loose bunches: it is with great difficulty the plants of this sort are kept alive here.

The fourth sort grows naturally on the *Alps*, and the *Helvetian* mountains, also in *Lapland* and *Siberia*. This sends out from the roots many slender branches, which trail upon the ground; which are garnished with oblong rough leaves, of a pale green colour; the flowers are produced from the wings of the leaves, upon long slender foot-stalks; and are succeeded by berries about the size of the common black Cherry, which are first green, afterward red, and when ripe they are black. This is also a very difficult plant to keep alive in gardens, for it is an inhabitant of bogs, growing among moss, where the ground is never dry.

The fifth sort grows naturally upon the mountains in

Spain, and some other parts of *Europe*. It rises little more than a foot high, dividing into many branches, which are closely garnished with smooth thick leaves of an oval form; the flowers are produced in small bunches toward the extremity of the branches, which are shaped like those of the common sort, but are smaller; and are succeeded by berries, of the same size with those of the former sort, which are red when ripe.

The true Adrachne is not at present in *England*, but there is a broad-leaved sort from the *Lewant*, whose leaves are sawed on their edges, which passes for it. The seeds of this must be procured from the *Lewant*, where the trees grow in plenty. The seeds may be sown, and the plants treated in the same way as the Arbutus, but the plants are much tenderer. As the leaves of this tree are larger than those of the common Arbutus, so the trees make a fine appearance, and deserve our care to cultivate them; therefore they should be preserved in pots three or four years, till they have obtained strength, and may then be planted in a warm situation and on a dry soil, for this sort will not thrive in wet ground.

ARCTIUM. *Lin. Gen.* 830. Burdock.

The Characters are,

The flower is composed of many florets, which are tubulous and uniform, cut into five narrow segments at the top: the germen is situated at the bottom of the tube, which afterward becomes a single pyramidal angular seed, crowned with down.

The Species are,

1. ARCTIUM foliis cordatis inermibus petiolatis capitulis majoribus sparsis. Burdock with heart-shaped leaves, without prickles, having foot-stalks, and large heads growing scatteringly.

2. ARCTIUM foliis cordatis inermibus, capitulis minoribus compactis. Burdock with heart-shaped leaves without spines, and small heads growing close together.

3. ARCTIUM foliis cordatis inermibus, capitulis tomento-reticulatis. Burdock with heart-shaped leaves without spines, and woolly netted heads.

The two first sorts are common weeds, growing on the sides of roads and foot-paths in most parts of *England*, so are not admitted into gardens. The first is ordered for medicinal use by the *College of Physicians*, therefore I have inserted it here.

The leaves of the third sort are like those of the common, but are whiter on their under side; the heads are more compact, and the florets are of a bright red colour; but the greatest difference is in their heads, which in this sort are beautifully netted with a fine down all over.

As these plants are seldom admitted into gardens, so it is needless to say any thing of their culture; but where they are troublesome weeds, it may not be amiss to mention, that their roots last but two years, so they may be destroyed with less trouble than such as have abiding roots; for the plants which come up from seed, do not flower till the second year, and when the seeds are perfected their roots decay.

ARCTOTIS, or ANEMONOSPERMOS.

The Characters are,

The common empalement is scaly and silvery; the flower is composed of many female florets, which are ranged round the border; the germen afterward becomes a single roundish seed, covered with a soft down. The middle or disk of the flower is composed of hermaphrodite florets; in the center is placed a small germen, supporting a cylindrical style with a single stigma. These flowers are abortive.

The Species are,

1. ARCTOTIS foliis pinnatis, caule herbaceo, petalis radii profundè trifidis. *Flor. Leyd.* 179. Anemonospermus of *Africa*, with hoary Dandelion leaves.

2. *ARCTOTIS foliis lanceolato-linearibus integris denticulatis.* *Lin. Hort. Cliff.* 412. *Arctotis* with narrow spear-shaped leaves, which are indented on the sides.

3. *ARCTOTIS foliis pinnato-sinuatis, laciniis oblongis dentatis.* *Lin. Hort. Cliff.* 412. *Arctotis* with sinuated winged leaves, with long indentures, and a beautiful Orange-coloured flower.

4. *ARCTOTIS foliis ovatis dentatis, petiolis longissimis, superne dentatis, caule ramoso.* *Lin. Hort. Cliff.* 412. *Arctotis* with oval indented leaves, with long foot-stalks, whose upper side is indented, and a branching stalk.

5. *ARCTOTIS ramis decumbentibus foliis linearilanceolatis rigidis subtus argenteis flore magno aureo pedunculo longissimo.* *Fig. Pl. Tab.* 49. *Arctotis* with trailing branches, narrow, stiff; spear-shaped leaves, white on their under side, and a large golden flower, with a very long foot-stalk.

6. *ARCTOTIS foliis pinnato-sinuatis subtus argenteis sessilibus, flore magno aurantio.* *Arctotis* with sinuated winged leaves, lying close to the stalk, white on their under side, and a large Orange-coloured flower.

7. *ARCTOTIS foliis ovatis nervosis marginibus crenatis petiolis longissimis.* *Arctotis* with nervous heart-shaped leaves, whose edges are indented, and very long foot-stalks.

8. *ARCTOTIS foliis pinnato-laciniatis undatis caule racemoso fruticoso.* *Arctotis* with winged jagged leaves, which are waved, and a branching shrubby stalk.

These plants are natives of the country about the *Cape of Good Hope*, from whence they have been brought to some curious gardens in *Holland* and *England*.

The first sort here mentioned is an annual plant, which may be sown upon a warm border of light earth in the open air, in the middle of *April*, where they are designed to remain; and require no farther care, but to thin the plants where they are too close, and keep them clean from weeds. They will flower in *August*, and perfect seeds very well in autumn.

The fifth, sixth, and seventh sorts are low plants, seldom rising in stem above four or five inches, their leaves spreading near the surface of the ground; the flowers are produced upon single naked foot-stalks arising from the root of the plants; these flower in *April* or *May*, at which time they make a fine appearance; but they seldom perfect their seeds in *England*; therefore are propagated by cuttings, which take root freely in the summer months. In winter the plants may be preserved under a good frame, where they may have a large share of free air, when the weather is mild; for if they are drawn weak by being kept in a green-house, they seldom produce many flowers.

The second, third, fourth, and eighth sorts, grow to the height of four or five feet, and the eighth, sometimes to six or seven, sending forth many branches; therefore will require to be frequently pruned, to keep the plants in tolerable order; for it sends forth strong rambling shoots, when their roots are not too much confined in the pots, but more so when they are duly watered.

The fifth and sixth sorts flower in *May* and *June*; these have very large beautiful flowers, especially the fifth, whose bottom is finely chequered with black and white, and the rays being of a deep gold colour, are set off by the other colours.

The shrubby sorts are propagated by planting cuttings in a bed of light fresh earth, in any of the summer months, observing to shade them from the heat of the sun until they have taken root; then they may be planted into pots filled with the like fresh earth, setting the pots in a shady place until the plants are settled in their new earth, after which time you should expose them to the open air until the latter end of *October*, or later, according as you find the weather is favourable; when you must remove the pots into the green-house, where they should be placed as near the window as possible, that they may have a good quantity of free air at all times when the weather is mild; you must also frequently refresh them with

water, giving them it plentifully in mild weather, otherwise their leaves and branches will hang down and wither. They will require to be shifted into other pots two or three times at least, every summer, and the pots should be frequently removed, to prevent the plants from striking their roots through the holes of the pots into the ground, which they are very apt to do, and then they will shoot very vigorously.

All these plants should be frequently renewed by cuttings, because the old plants are subject to decay in winter; therefore if young plants are not annually raised, the species may soon be lost.

ARGEMONE, Prickly Poppy.

The Characters are,

The flower hath five roundish petals, which spread open, and are larger than the empalement; in the center is situated an oval five-cornered germen. This is attended by a great number of stamina; the germen afterward becomes an oval seed-vessel, having five angles, and so many cells, which are filled with small rough seeds.

There is but one Species of this plant known, which is,

ARGEMONE Mexicana. *Tourn.* The Prickly Poppy.

This is an annual plant, which is very common in most parts of the *West-Indies*; and is, by the Spaniards, called *Fico del Inferno*, or the Devil's Fig; there is no great beauty or use of this plant amongst us, that I know of; but whoever hath a mind to cultivate it, should sow it on a bed of light earth, in the spring, where it is to remain; and if it comes up too thick, the plants must be thinned out to four inches distance, where, when once it has shed its seed, there will not want a supply of plants for several years after.

ARIA THEOPHRASTI. See *Cratægus*.

ARISARUM. See *Arum*.

ARISTOLOCHIA, Birthwort.

The Characters are,

The flower is of one leaf, which is unequal; the base is swelling and globular, afterward is extended in a cylindrical tube, which spreads open at the brim, where the lower part is stretched out like a tongue. The oblong angular germen fits under the flower, which afterward turns to a large seed-vessel, differing in form, which opens in six cells, which are filled with seeds, for the most part compressed.

The Species are,

1. *ARISTOLOCHIA foliis cordatis, subsessilibus obtusis, caule infirmo, floribus solitariis.* *Lin. Sp. Plant.* 962. Round-rooted Birthwort with a black purple flower.

2. *ARISTOLOCHIA foliis cordatis petiolatis integerrimis obtusiusculis, caule infirmo floribus solitariis.* *Lin. Sp. Plant.* 962. The true long-rooted Birthwort.

3. *ARISTOLOCHIA foliis cordatis caule erecto floribus axillaribus confertis.* *Hort. Upsal.* 279. Upright or climbing Birthwort.

4. *ARISTOLOCHIA foliis cordatis, crenulatis petiolatis, floribus solitariis.* *Lin. Sp. Pl.* 962. Birthwort, called Pistolochia.

5. *ARISTOLOCHIA foliis cordato-oblongis undatis, caule infirmo, floribus solitariis.* *Lin. Sp. Pl.* 961. Ever-green Birthwort of *Crete*.

6. *ARISTOLOCHIA foliis cordato-oblongis planis, caulibus infirmis flexuosus, teretibus floribus solitariis.* *Lin. Sp. Plant.* 961. The *Virginia Snakeroot*.

7. *ARISTOLOCHIA foliis cordato-lanceolatis caule erecto fruticoso.* *Lin. Sp. Pl.* 960. *Virginia Birthwort* with eared leaves.

8. *ARISTOLOCHIA foliis cordato-oblongis caule volubili pedunculis multifloris.* *Flor. Zeyl.* 323. The *Conrayerva* of *Jamaica*.

9. *ARISTOLOCHIA hirta floribus solitariis pendulis recurvatis sublabiatis.* *Lin. Sp. Plant.* Long-rooted hairy Birthwort with an oblong leaf and a large flower.

The first and second sorts grow naturally in the south of *France*, in *Spain*, and *Italy*, from whence they are brought for medicinal use. The roots of the first sort are roundish,

and grow to the size of small Turneps; and are in shape and colour like the roots of the common Cyclamen, the roots of which are frequently sold in the markets for those of the round Birthwort, which at first may have been occasioned by the supposed virtues of the roots of the Cyclamen. This sort hath three or four weak trailing branches, which lie on the ground where they are not supported, and extend to the length of two feet; the leaves are heart-shaped, and rounded at their extremity; the flowers come out singly, at every leaf, toward the upper part of the stalk. They are of a purplish black colour, and shaped like those of the other sorts, and are frequently succeeded by oval seed-vessels, having six cells, which are full of flat seeds.

The second sort hath long tap roots, shaped like those of Carrots; this has weak trailing branches, which extend little more than a foot; the leaves of this sort are paler, and have longer foot-stalks than the first; the flowers come out from the wing of the leaves, like the other, and are of a pale purple colour: they are sometimes succeeded by oblong seed-vessels, having six cells filled with compressed seeds.

They are both propagated by seeds, which should be sown in the autumn, in pots filled with light earth, and placed under a frame, to be screened from the frost. If these pots are put into a gentle hot-bed in *March*, it will bring up the plants much sooner than they otherwise would rise. When the plants come up, they should be inured by degrees to bear the open air; in summer they must have gentle refreshings of water in dry weather; but in the autumn, when their stalks begin to decay, they must have little wet: in the winter the pots must be sheltered under a frame, and in *March*, before the roots begin to shoot, they should be transplanted into separate small pots filled with light earth, when they may be removed into the open air, and treated in the same manner as in the former summer, and sheltered also the following winter. The next spring they may be turned out of the pots, and planted in a warm border; where, in the autumn, when their stalks are decayed, if the border is covered with old tanners bark to keep out the frost, the roots will be secured; but where this care is not taken, the roots are frequently killed by frost.

When the seeds of these plants are sown in the spring, the plants will not appear till the spring following; so that a whole season is lost, and many times they fail, therefore it should always be sown in the autumn.

The third sort grows naturally in *France, Spain, Italy, and Hungary*, but is preserved in some of the *English* gardens because it is sometimes used in medicine. This is a mischievous plant for creeping at the root; so that if once it has taken in a garden, it will be difficult to extirpate again: it will thrive in almost any soil or situation.

The fourth sort grows wild in *Spain, Italy*, and the south of *France*; but in *England* it is preserved, for variety, in botanick gardens. The plants of this sort must be planted in pots filled with light earth, and sheltered from severe cold in winter, but they should have as much free air as possible in mild weather.

The fifth sort grows naturally in *Crete*. The root of this sort is perennial, and sends out many trailing branches, which extend to about one foot and an half in length, with oblong heart-shaped leaves, which are evergreen. The flowers are shaped like the others of this genus, of a dark purple colour, but never produce seeds in *England*, so are propagated by parting of the roots: this sort is too tender to thrive in the open air in winter, so is preserved in pots, and placed under a common frame in winter, where they should have as much free air as possible in mild weather.

The sixth sort is the Snakeroot, which is greatly used in medicine; these roots are brought over from *Virginia* and *Carolina*. There are some of these plants preserved in

the gardens of those who are curious, but as they are sometimes killed by frost in winter, so they are not very common in the *English* gardens. This sort is propagated by seeds, which should be sown in the autumn, and afterward treated in the same manner as hath been directed for the two first sorts, with which management they will produce their flowers, and perfect their seeds every year.

The seventh sort grows naturally in *North America*, and is by some called Snakeroot, but is not near so strong as the former; the branches of this grow erect, and are perennial, whereas those of the other sort decay to the root every winter: this rises about two feet high; the branches are not woody, but are strong enough to support themselves; the leaves are oblong and heart-shaped. This sort will live abroad in warm borders, with a little protection in hard frosts. It is propagated by seeds as the former, and may also be increased by parting of the roots.

The eighth sort grows naturally in *Jamaica*, where it is called Contrayerva; the roots are there used as such: this hath long trailing branches, which climb upon the neighbouring plants, and rise to a considerable height; the flowers are produced in small clusters, toward the upper part of the stalks, which are of a dark purple colour. This plant is tender, and in winter should have very little wet, therefore must be constantly kept in the stove, otherwise it will not live in *England*.

The ninth sort was discovered by Dr. *Tournefort* in the *Levant*. This hath some resemblance to the second sort, but the leaves are not so deeply eared at bottom, and are hairy; the flowers of this are also much larger. This may be propagated by seeds, in the same manner as hath been directed for the first and second sorts, and the plants so treated will thrive very well here.

ARMENIACA, the Apricot.

The Characters are,

The flower is composed of five large roundish petals which spread open, whose base is inserted in the empalement; in the center is placed a round germen, attended by upward of twenty awl-shaped stamina. The germen afterward becomes a roundish pulpy fruit, having a longitudinal furrow inclosing a roundish nut, which is a little compressed on the sides.

The specific title given by *Linnaeus* to the Apricot is, *Prunus floribus subsessilibus foliis subcordatis. Sp. Plant. 474.*

The Varieties are,

1. The Masculine Apricot.
2. The Orange Apricot.
3. The *Algier* Apricot.
4. The *Roman* Apricot.
5. The *Turkey* Apricot.
6. The *Breda* Apricot.
7. The *Brussels* Apricot.

The Masculine is the first ripe of all the Apricots; it is a small, roundish fruit, of a red colour towards the sun; as it ripens, the colour fades to a greenish yellow on the other side. The tree is very apt to be covered with flowers, but as they come out early in the spring, they are frequently destroyed by the cold, unless the trees are covered to protect them.

The Orange is the next ripe Apricot; this fruit is much larger than the former, and as it ripens, changes to a deep yellow colour. The flesh of this is dry, and not high flavoured, it is better for tarts than for the table.

The *Algier* is the next in season; this is of an oval shape, a little compressed on the sides; it turns to a pale yellow, or straw colour, when ripe; the flesh is dry, and not high flavoured: this, and what is by some persons called the common Apricot, are often confounded.

The *Roman* is the next ripe Apricot; this is a larger fruit than the former, and not compressed so much on the sides; the colour is deeper, and the flesh is not so dry as the former.

The

The *Turkey Apricot* is yet larger than either of the former, and of a globular figure; the fruit turns to a deeper colour than the former; the flesh is firmer, and of a higher flavour than either of the former.

The *Breda Apricot* (as it is called from its being brought from thence into *England*) was originally brought from *Africa*: this is a large roundish fruit, changing to a deep yellow when ripe; the flesh is soft, full of juice, and of a deep Orange colour within side; the stone is rounder and larger than any of the other sorts: this is the best Apricot we have, and when ripened on a standard, is preferable to all other kinds.

The *Brussels* is the latest ripe of all the Apricots, for when it is planted against a wall, it is generally the beginning of *August* before it is ripe, unless when it is planted to a full south aspect; which is what should not be practised, because the fruit is never well tasted which grows in a warm exposure. This fruit is of a middling size, rather inclining to an oval figure; red on the side next the sun, with many dark spots, and of a greenish yellow on the other side; the flesh is firm, and of an high flavour; the fruit often cracks before it is ripe.

Most people train these trees up to stems of six or seven feet high, or bud them upon stocks of that height; but this is a practice I would not recommend to the publick, because the higher the heads of these trees are, the more they are exposed to the cutting winds in the spring, which too frequently destroy the blossoms; and the fruit is also more liable to be blown down in summer, especially if there should happen to be much wind at the time when the fruit is ripe; which by falling from a great height, will be bruised and spoiled; therefore I prefer half standards, of about two and an half, or three feet in the stem, to those which are much taller.

These fruits are all propagated by budding them on Plum stocks, and will readily take upon almost any sort of Plum, provided the stock be free and thriving (except the *Brussels* kind, which is usually budded on a sort of stock, commonly called the *St. Julian*, which better suits this tree, as being generally planted for standards, than any other sort of Plum will). The manner of raising the stocks, and budding these trees, shall be treated of under their particular articles, to which I refer the reader, and shall proceed to their planting and management.

These trees are all (except the two last sorts) planted against walls, and should have an east or west aspect; for if they are planted full south, the great heat causes them to be mealy before they are well eatable.

The borders under these walls should be six feet wide, at least, and if it were more, the better, but I would never advise the making of them so deep as is the general custom; for if the earth be two feet deep, or two and an half at most, it is enough.

If your ground is a wet cold loam or clay, you should raise your borders as much above the level of the surface as it will admit, laying some stones or rubbish in the bottom, to prevent the roots from running downwards; but if you plant upon a chalk or gravel, it will be better to raise the borders to a proper thickness, with good loamy earth, than to sink the borders by removing the chalk or gravel; for although these are removed the whole breadth of the border, which we may allow to be eight feet, and this trench filled with good earth, yet the roots of the trees will in a few years extend this length, and then meeting with the chalk or gravel, will occasion the leaves of the trees to turn pale, and fall off early in the season; the fruit will be small, dry, and ill flavoured, and the shoots of the trees will be weak. But where the borders are raised above the chalk to their full height, the roots will not strike down into the gravel or

chalk, but rather extend themselves near the surface, where they will meet with better soil: and as these trees are of long duration, and old trees being not only more fruitful than young, but the fruit is also better flavoured; therefore the providing for their continuance is absolutely necessary.

The soil I would in general advise to be used for these, and all other sorts of fruit trees, is fresh untried earth, from a pasture ground, taken about ten inches deep, with the turf, and laid to rot and mellow at least twelve months before it is used; and this must be kept often turned, to sweeten and imbibe the nitrous particles of the air.

Your borders being prepared, make choice of such trees as are but of one year's growth from budding; and if your soil is dry, or of a middling temper, you should prefer *October* as the best season for planting, especially having at that time, a greater choice of trees from the nurseries, before they have been picked and drawn over by other people. The manner of preparing these trees for planting is the same in common with other fruit trees. But do not cut off any part of the head at that time, unless there are any strong foreright shoots which will not come to the wall, which may be taken quite away.

Your trees being thus prepared, you must mark out the distances they are to stand, which in a good strong soil, or against a low wall, should be twenty feet or more; but in a moderate soil, and against taller walls, eighteen feet is a good reasonable distance; then make a hole where each tree is to stand, and place its stem about four inches from the wall, inclining the head thereto; and after having fixed the tree in the ground, nail the branches to the wall, to prevent their being shaken. In this state the trees may remain till the middle of *March*, when, if the weather is good, you must unnailed the branches of your trees, so as not to disturb their roots; and, being provided with a sharp knife, put your foot close to the stem of the tree; and having placed your left-hand to the bottom of the tree, to prevent its being disturbed, with your right-hand cut off the head of the tree, if it has but one stem, or where it may have two or more shoots, each of them must be shortened, to about four or five eyes above the bud, so that the sloping side may be toward the wall.

In the spring, if the weather proves dry, you must now-and-then give your trees a gentle refreshing with water, all over their heads, which will greatly help them; and also lay some turf, or other mulch, round their roots, to prevent their drying during the summer season; and as new branches are produced, observe to nail them to the wall in a horizontal position; and such shoots as are produced foreright, must be entirely displaced. This must be repeated as often as is necessary, to prevent their growing from the wall, but by no means stop any of the shoots in summer.

At *Michaelmas*, when the trees have done growing, you must unnailed their branches, and shorten them in proportion to their strength; a vigorous branch may be left eight or nine inches long, but a weak one should not be left above five or six.

When you have shortened the shoots, be sure to nail them as horizontally as possible, for upon this it is that the future good of the tree chiefly depends.

The second summer observe, as in the first, to displace all foreright shoots, as they are produced, nailing in the other close to the wall horizontally, so that the middle of the tree may be kept open; and never shorten any of the shoots in summer, unless to furnish branches to fill vacant places on the wall; and never do this later than *April*. At *Michaelmas* shorten these shoots, as was directed for the first year; the strong ones may be left nine or ten inches, and the weak ones six or seven at most.

The following year's management will be nearly the same with this, but only observe, that Apricots produce their blossom buds, not only upon the last year's wood, but also upon the cursons, or spurs, which are produced from the two years wood; a great care should therefore be had in the summer management, not to hurt or displace them; observe also to shorten your branches at the winter pruning, so as to furnish bearing wood in every part of the tree.

These few rules, well executed, together with a little observation and care, will be sufficient; and to pretend to prescribe particular directions for all the different accidents, or manner of treating fruits, would be impossible.

The *Brussels* and *Breda* Apricots, being, for the most part, planted for standards, will require very little pruning or management; only observe to take out all dead wood, or such branches as cross each other; this must be done early in autumn, or in the spring, after the cold weather is past, that the part may not canker where the incision is made.

ARMERIUS, Sweet-William. See *Dianthus*.

ARNICA. *Lin. Gen. Plant.* 784. Leopardbane.

The Characters are,

It hath a compound flower, the border or rays being composed of many female florets, which spread open; the disk, or middle, has many hermaphrodite flowers, which are tubulous, and have each five short stamina. In the hermaphrodite flowers the germen is situated below the flower, which after-ward becomes a single oblong seed, crowned with long slender down.

The Species are,

1. ARNICA foliis ovatis integris, caulinis geminis oppositis. *Lin. Sp. Plant.* 884. Arnica with entire oval leaves, and those on the stalks growing opposite by pairs.

2. ARNICA foliis alternis serratis. *Hall. Helvet.* 737. Arnica with sawed leaves growing alternately.

The first sort grows naturally upon the Alps, and also upon many of the mountains in Germany, and other cold parts of Europe, and is greatly esteemed by the Germans for its medicinal qualities, where it is prescribed by this title of Arnica.

The roots of this plant, when placed in a proper soil and situation, do greatly increase, for they send out thick fleshy roots, which spread very far under the surface; these put out many oval entire leaves, from between which the flower-stems arise, which grow about a foot and an half high; the top is terminated by a single yellow flower, composed of many florets, like those of Dandelion. These are succeeded by oblong seeds, which are crowned with down.

This plant delights in a moist shady situation; it may be propagated by parting of the root in autumn, when the stalks begin to decay, or by the seeds sown in autumn, soon after they are ripe, for those sown in the spring often fail.

The second sort grows naturally on the mountains of Bohemia, as also in Siberia. The roots of this sort are much jointed, and divide into many irregular fleshy offsets, which are variously contorted; from whence many superstitious persons have been led to imagine, that the roots would expel the poison of scorpions, and cure the wounds made by the bite of that animal. It is a very hardy plant, and is propagated in the same manner as the former.

ARTEDIA. *Lin. Gen. Plant.* 249. We have no English name for this genus.

The Characters are,

It is an umbelliferous plant; the rays of the large umbel are difform, the flowers of the small ones in the disk are male, and the rays are hermaphrodite. These have each five slender stamina; those flowers which compose the rays, have a small germen at bottom, which after-ward becomes a roundish compressed fruit, with a leafy border, which splits into two, and contains two oblong seeds, with scaly borders.

The Species are,

1. ARTEDIA seminibus squamatis, *Hort. Cliff.* 89. Artedia with squamose seeds.

2. ARTEDIA seminibus aculeatis. *Hort. Cliff.* 89. Artedia with prickly seeds.

The first is a native of the east, *Rawwolf* found it growing upon mount *Libanus*. It is an annual plant, whose stalks rise about two feet high, sending out a few side branches, which are garnished with narrow compound leaves resembling those of Dill; the extremity of the stalk is terminated by a large umbel of white flowers, composed of five unequal petals. These are succeeded by roundish compressed fruit, each having two seeds, whose borders are scaly.

The second sort grows upon the African shore in the Mediterranean, as also in Spain. This is also an annual plant, with an upright stalk near three feet high, and puts out many side shoots; the leaves are hairy, and greatly resemble those of the common Carrot; the stalks are terminated by umbels of large white flowers, shaped like those of the former, and are succeeded by a prickly fruit, composed of two seeds.

Both these plants decay as soon as they perfect their seeds, and many times before they are ripe, in England; for unless the seeds are sown in autumn, and the plants come up before winter, they rarely produce good seeds here. The seeds should be sown on a warm border where the plants are to remain, for they will not bear transplanting.

ARTEMISIA, Mugwort.

The Characters are,

The flower is composed of hermaphrodite and female florets; the hermaphrodite flowers compose the disk, or middle. In the center is placed the germen, which is accompanied by five hairy stamina; the germen after-ward becomes a single naked seed, sitting upon a naked placenta.

The Species are,

1. ARTEMISIA foliis pinnatifidis planis incisus subtus tomentosus, racemis simplicibus floribus ovatis radio quinquesfido. *Lin. Sp. Plant.* 348. Common Mugwort.

2. ARTEMISIA foliis lanceolatis subtus tomentosus integerrimis dentatisque. *Lin. Sp. Plant.* 848. Mugwort with spear-shaped leaves which are entire, and indented on their edges, and their under side woolly.

The first sort grows naturally on banks, and by the side of foot paths, in most parts of England, so is rarely admitted into gardens, for the roots creep far under the surface of the ground; so that unless they are stopped, they will soon spread over a large space of ground. This flowers in June, at which time the herb is in perfection for use.

The Moxa, so famous in the eastern countries for curing the gout by burning of the part affected, is the lanugo, or down, which is on the under part of the leaves of Mugwort.

The second sort grows naturally in Siberia; it rises up with single stalks about two feet high; the flowers come out from the wings of the leaves in small loose spikes, and near the top they are often single; these are larger than those of the common sort, and are of a pale yellow colour.

This sort is as hardy as the common sort, and multiplies as fast, but is only preserved in botanick gardens for the sake of variety.

ARTICHOKE is called by the *Latins* Cinara.

As this plant is much better known by its English title than the Latin, I shall treat of it under this head, and refer for its characters to the Latin title of Cinara, under which the other species will be exhibited.

We have two sorts of Artichokes, which are cultivated in the English gardens, which we shall distinguish here only by the names they are generally known among the gardeners.

The best sort is what the gardeners call the globe Artichoke. This hath large heads, with broad brown scales, which turn inward; the fleshy part at the bottom of the scales is very thick, therefore is much preferred to the other, which is called the French Artichoke. The stalks of which

do generally grow taller, and the heads are smaller, and shaped more conical than those of the globe. The scales are narrower, of a greener colour, and frequently turned outward. The fleshy part which is eaten is not near so thick, and hath a disagreeable perfumed taste; this was almost totally rooted out of the *English* gardens before the hard frost in 1739-40, when the greatest part of the roots of the other sort were destroyed, so many persons were supplied the following spring with plants from *Guernsey*, where they cultivate only the latter sort; but since the other has been increased again, this green sort has been in most gardens rooted out, to make way for the globe Artichoke.

The manner of propagating this plant is from slips, or suckers taken from the old roots, in *February* or *March*, which, if planted in a good soil, will produce large fair fruit the autumn following; but as this is a plant which few gardeners, that have not been bred in the kitchen gardens near *London*, understand to manage well, I shall be the more particular in my directions about it.

About the beginning of *March*, according to the earliness of the season, or forwardness of the old Artichoke stocks, will be the proper time for dressing them, which must be thus performed: with your spade remove all the earth from about your stock, down below the part from whence the young shoots are produced, clearing the earth from between the shoots, so as to be able to judge of the goodness of each, with their proper position upon the stock; then make choice of two of the clearest, straightest, and most promising plants that are produced from the under part of the stock, which are much preferable to the strong thick plants which generally grow upon the crown of the roots, for these have hard woody stems, so do never produce good fruit, but generally are what the market gardeners call rogues, which have very little bottom, and the scales of their heads are irregularly placed; in slipping off the other shoots, you must be careful not to injure the plants which you are to let remain for a crop; then with your thumb force off all the other plants and buds close to the head of the stock, from whence they are produced, being very careful not to leave any of the buds, and with your spade draw the earth about the two plants which are left, and with your hands close it fast to each of them, separating them as far asunder as they can conveniently be placed without breaking them, observing to crop off the tops of the leaves which hang down, with your hands; your ground being levelled between the stocks, you may sow thereon a small crop of Spinage, which will be taken off before the Artichokes will cover the ground; and toward the latter end of *April*, or the beginning of *May*, when your plants begin to shew their fruit, you must carefully look over your stocks, and draw up all young plants from them, which may have been produced from the roots since their dressing, and cut off all suckers which are produced from the stems of the Artichokes, leaving only the principal head, by which means your fruit will be larger; when your Artichokes are fit to gather, you must break, or cut them down close to the surface of the ground, that your stocks may make strong fresh shoots by the middle of *November*, which is the season for earthing; or, as the gardeners term it, landing them up, which is thus done:

Cut off all the young shoots quite close to the surface of the ground; then dig between every stock, raising all the earth between each row of stocks into a ridge, as is done in the common method of trenching ground, in such manner as that the row of Artichokes may be exactly in the middle of each ridge; this will be sufficient to guard them against common frost; and I would here recommend it to the publick, as infinitely preferable to long dung, which is by the unskilful often used to cover the roots, and is the occasion of their fruit being small, and almost without any bottoms

to them; for there is not any thing so hurtful to these roots, as new dung being either buried near, or laid about them. Observe, that although I have mentioned *November* as the season for earthing them, yet if the weather proves mild, it may be deferred till any time in *December*.

As we have experienced, that, in very severe frosts, these roots are sometimes destroyed, therefore it is proper to give some directions to prevent it; although this rarely happens in dry ground, in which we have but few instances of their being killed, except in the hard frosts of 1683, and 1739-40. In these two winters most of the Artichokes were destroyed in *England*; in the last of these winters, it happened from the little care which was taken of them, there having been no severe frost for so many years before, which had injured them, that few people used any care to preserve them; but since that hard frost, many people have run into the other extreme, of covering all their roots of Artichokes with long dung every winter, which is a very bad method, because the dung lying near the roots, is very apt to rot the best plants; therefore I would advise the earthing (or as it is called by the gardeners, landing) of the Artichokes to be deferred till the latter end of *November*, provided the season continues mild; and towards *Christmas*, if there is any danger of severe frosts, to lay a quantity of long dung, pease-haulm, tanners bark, or any other light covering over the ridges of earth, which will keep out the frost; and this being at a distance from the roots, will not injure them; but this covering should be carefully taken off the beginning of *February*, or sooner, provided the season is mild, or at least so soon as the weather is so, otherwise the plants will be injured by its lying too long upon them.

When you have thus earthed them up, you have nothing more to do till *March*, by which time the plants will have grown through the ridge of the earth; therefore when the weather is proper, the roots must be dressed as was before directed.

When you have a mind to make a new plantation of Artichokes, after having digged and buried some very rotten dung in the ground you have allotted for that purpose, make choice of such of your plants as were taken from your old stocks, which are clear, sound, and not woody, having some fibres to their bottom; then with your knife cut off that knobbed woody part, which joined them to the stock; and if that cuts crisp and tender, it is a sign of its goodness, but if tough and stringy, throw it away as good for nothing; then cut off the large outside leaves of the plants intended for planting pretty low, that the middle, or heart leaves, may be above them: Your plants being thus prepared (if the weather is very dry, or the plants have been any time taken from the stocks, it will be convenient to set them upright in a tub of water for three or four hours before they are planted, which will greatly refresh them), you must then proceed to planting, which must be done by ranging a line across the ground, in order to their being placed exactly in a row, and, with a measure-stick, plant them at two feet distance from each other in the rows, and if designed for a full crop, five feet distance row from row; your plants must be set about four inches deep, and the earth closed very fast to their roots, observing, if the season proves dry, to keep them watered two or three times a week, until they are growing, after which they do not require any.

N. B. You may sow a thin crop of Spinage upon the ground before you plant your plants, observing to clear it from about them after it is come up.

These plants, in a kindly season, or on a moist soil, will produce the largest and best Artichokes some time in *August* and *September*, after all those from the old stocks are past; so that if you intend to continue your Artichokes through the whole season, you must make a new plantation every year, otherwise

otherwise you cannot possibly have fruit longer than two or three months.

If any of the plants which are planted in the spring, should not fruit in autumn, you may, at the season of earthing up your roots, tie up the leaves with a small willow twig, &c. and lay the earth up close to it, so that the top of the plant may be above ground, and when the frost comes on, if you will cover the top with a little straw, or pease-haulm, to prevent their being killed by frost, these plants will produce fruit in winter, or early in the spring.

But in those plantations where you intend to plant other things between your Artichokes, you must allow nine or ten feet between the rows, as is often practised by the kitchen gardeners near London, who sow the ground between with Radishes or Spinage, and plant two rows of Cauliflowers, at four feet distance row from row, and two feet and an half distance in the rows between them; so that there are always five feet allowed for the Artichokes to grow; and in May, when the Radishes or Spinage are taken off, they sow a row of Cucumbers for pickling, exactly between the two rows of Cauliflowers, and at three feet distance from each other; and between the rows of Cauliflowers and the Artichokes, plant a row of Cabbages or Savoys for winter use, which, when the Cauliflowers are drawn off, and the Artichokes gathered, will have full liberty to grow; and by this means the ground is fully employed through the whole season. This has long been the practice of the kitchen gardeners near London, who pay large rents for their land, so are obliged to get as many crops in a year from it as possible.

If in the spring you find your stocks shoot very weak, which may have been occasioned either by hard frost, or too much wet, you must then uncover them, and with your spade loosen and break the earth about them, raising a small hill about the plants of each stock, levelling the rest between the rows, which will greatly help them; and in three weeks, or a month's time after, they will be fit to slip.

Those Artichokes which are planted in a moist rich soil, will always produce the largest and best fruit; so that where such a soil can be obtained, it will be proper to make a fresh plantation every spring, to succeed the old stocks, and supply the table in autumn. But the roots will not live through the winter in a very moist soil, so that your stocks which you intend should remain, to supply the table early, and to furnish plants, should be in a drier situation. You should always observe to plant these in an open spot of ground, not under the drip of trees, where they will draw up very tall, and produce small insignificant fruit.

ARTICHOKES of Jerusalem. See Helianthus.

ARUM, Wake Robin, or Cuckow Pint.

The Characters are,

The flower hath a long oblong spathe; the spadix is single, shaped like a club at the top, upon which the germen are situated. It hath no petals nor stamina, but many four-cornered summits, sitting close to the germen. There are many germen which surround the upper part of the spadix, which are oval, having no styles, but have bearded stigma: the germen afterward become globular berries, with one cell, having round seeds.

The Species are,

1. ARUM *acaule foliis hastatis integerrimis spadice clavato.* Hort. Cliff. 434. The common Arum, or Wake Robin, with spotted and plain leaves.

2. ARUM *acaule foliis hastatis acutis petiolis longissimis spathe maximâ erectâ.* Largest Italian Arum, with white veins.

3. ARUM *acaule foliis hastatis spathe declinatâ filiformi subulata.* Lin. Sp. Plant. 966. Friars Cowl with a flower ending in a slender tail.

4. ARUM *acaule foliis cordato-oblongis spathe bifidâ spadice incurvo.* Hort. Cliff. 435. Greater broad-leaved Friars Cowl.

5. ARUM *acaule foliis lanceolatis spadice setaceo declinato.*

Hort. Cliff. 345. Narrow-leaved Friars Cowl of Dioscoridis.

6. ARUM *acaule foliis hastato-cordatis acutis angulis obtusis.* Hort. Cliff. 434. Arum without stalk, pointed spear heart-shaped leaves, with obtuse angles.

7. ARUM *acaule foliis ternatis.* Flor. Virg. 113. Three-leaved Arum without stalk.

8. ARUM *foliis pedatis, foliolis lanceolatis integerrimis æquantibus spathe spadice longiorem.* Prod. Leyd. 7. Common Dragon.

9. ARUM *foliis pedatis, foliolis lanceolatis integerrimis superantibus spathe spadice breviorum.* Prod. Leyd. 7. Smaller dwarf Arum with many leaves.

10. ARUM *acaule foliis trilobis flore sessile.* Flor. Zeyl. 326. Broad-leaved low Arum of Ceylon with a scarlet pistil.

11. ARUM *acaule foliis peltatis ovatis repandis basi semibifidis.* Hort. Cliff. 434. Greatest Egyptian Arum, vulgarly called Colocasia.

12. ARUM *acaule foliis cordatis nervosis floribus sessilibus.* American Arum with a Beet leaf called Scunk Weed.

13. ARUM *acaule foliis cordatis angulatis divaricatis.* Lin. Sp. Pl. 966. Arum without stalk, and spear-shaped leaves.

14. ARUM *acaule foliis cordatis obtusis mucronatis angulis rotundatis.* Hort. Cliff. 435. Arum without stalk, blunt heart-shaped leaves, which are pointed, and the angles rounded. This is commonly called Edder in America.

15. ARUM *acaule foliis peltatis ovatis integerrimis basi semibifidis.* Hort. Cliff. 453. Eatable Arum with a Water Lily leaf.

16. ARUM *acaule foliis sagittatis acuminatis nervosis.* Greatest Egyptian Arum, or Colocasia with blackish stalks.

17. ARUM *acaule foliis hastatis acuminatis spathe mucronatâ revolutâ.* Dwarf broad-leaved Arum of Ceylon with a purple pistil.

18. ARUM *caulescens foliis sagittatis spathe declinatâ clausâ.* Tree-like Arum with lance-shaped leaves, commonly called Dumb Cane.

The first sort grows naturally in woods, and on shady banks in most parts of England, so is seldom admitted into gardens; but being a medicinal plant, it is here inserted to introduce the other species. There are two varieties of this, one with plain leaves, and the other hath leaves full of black spots; but these are only accidental varieties, which arise from the same seeds. The roots of this are ordered by the College of Physicians to be used in a powder which bears the title of the plant; but these roots are generally gathered in the spring, when the leaves are in full vigour, so that the roots shrink and soon loose their pungent quality; but those which are taken up when the leaves decay, will continue good a whole year, and retain their pungency the same as when first taken up. The not observing this, has brought the medicine into disrepute. It flowers in April, and the seeds ripen in July, when is the best time to take up the roots.

The second sort grows naturally in Italy, Spain, and Portugal. The leaves of this sort rise a foot and an half high, are very large, running out to a point; these are finely veined with white, interspersed with black spots, which, together with the fine shining green of their surface, make a pretty variety. The flowers grow near a foot high, and have very long upright spathe, which are of a pale green, inclining to white; these appear the end of April, or beginning of May; this propagates very fast by offsets from the root, and will thrive in any soil or situation. The best time to transplant them is from the time the seeds are ripe, to the end of October.

The third, fourth, and fifth sorts hath been generally separated from this genus, and were distinguished by the title of Arisarum, or Friar's Cowl, from the resemblance the flower has in shape to the hoods or cowls worn by the people of that order. These are very low plants, their leaves having very short foot-stalks, and the flowers grow close to

the ground. They flower in *April*. The time for transplanting the roots is the same as for the former.

The sixth and seventh sorts grow naturally in *Virginia* and *Carolina*; these never rise with stalks, but their leaves arise immediately from the roots, having short foot-stalks; the flowers come up between their leaves, which have short foot-stalks; they appear in *May*, but have little beauty, so the plants are only kept in botanick gardens for the sake of variety.

The eighth sort is the common Dragon, which is used in medicine, and has been generally ranged in a separate genus from this under the title of *Dracunculus*.

This sort is used in medicine, so is preserved in some gardens, to supply the markets: it grows naturally in most of the southern parts of *Europe*, from whence it was first obtained. It hath a strait stalk three or four feet high, which is spotted like the belly of a snake; at the top it spreads out into leaves, which are cut into several narrow segments, almost to the bottom, and are spread open like a hand; at the top of the stalk the flower is produced, which is in shape like the common *Arum*, having a very long spathe of a dark purple colour, standing erect, with a large pistil of the same colour, so that when it is in flower, it makes no unpleasing appearance; but the flower hath so strong a scent of carrion, that few persons can endure it; for which reason it hath been banished most gardens; but was it not for this, a few of the plants might merit a place in gardens, for the oddness of the flower. It is very hardy, so will grow in any soil or situation, and propagates fast by offsets from the root. There is a variety of this with variegated leaves and stalks, which is preserved in the gardens of some persons who are fond of striped leaved plants.

The ninth sort grows naturally in moist places in *Virginia* and *New England*, but is very difficult to preserve long in a garden, especially if the soil is dry. The leaves of this sort are divided like those of the former, but are smaller, and rarely grow more than nine inches high; the flowers are like those of the common *Arum*.

The tenth sort grows naturally in *Ceylon*, and some other parts of *India*, so is very impatient of cold: it is a plant of humble growth; the flower rises immediately from the root, standing on a very short foot-stalk; the spathe is long, erect, and of a fine scarlet within, as is also the pistil. This plant must be placed in the tan bed of the bark stove, otherwise it will not thrive in *England*. It is propagated by offsets from the root, which come out in plenty when the plants are in health.

The eleventh, thirteenth, fourteenth, fifteenth, and sixteenth sorts, have mild roots, which are eaten by the inhabitants of all the hot countries, where they grow naturally, and some of the sorts are cultivated by the inhabitants of the Sugar colonies, as esculent plants, their roots being constantly eaten; as also are the leaves of some of the sorts, particularly the fifteenth, which they call *Indian Kale*: the leaves of this are boiled, and supply the want of other greens. It is esteemed a wholesome green; and in those countries where many of the common *European* vegetables are with difficulty produced, this proves a good succedaneum. The sixteenth sort has not been many years introduced among them, for it came originally from the *Spanish West-Indies*, where it grows in great plenty. Both these have larger roots than the fifteenth, for which reason they are preferred to it.

All these sorts are preserved in the gardens of those persons, who are curious in collecting exotick plants, for the variety of their leaves; for their flowers have very little beauty, nor do they often appear in this country. The plants are propagated easily by offsets from their roots, which they put out plentifully: these must be planted in pots filled with rich earth, and plunged into a hot-bed; and

if they are afterward continued in the bark stove, they will make great progress, and their leaves will be very large.

The roots of the seventeenth sort I received from *India*; this annually flowers in *May*; the leaves grow near the ground, having short foot-stalks; the flower comes up immediately from the root, upon a short foot-stalk, and is of a very deep purple colour, and smell almost like the flower of *Dragon*. It is tender, so must be constantly kept in the bark stove, otherwise it will not thrive in *England*.

The eighteenth sort grows naturally in the Sugar islands, and other warm parts of *America*, chiefly in the low grounds; the whole plant abounds with an acrid juice, so that if a leaf or part of the stalk is broken, and applied to the tip of the tongue, it occasions a very painful sensation, and occasions the salivary ducts to swell, and brings on a great defluxion of saliva; the stalks of this plant are sometimes applied to the mouths of the negroes by way of punishment. This sort is propagated by cutting off the stalks into lengths of three or four joints, which must be laid to dry six weeks or two months; for if the wounded part is not perfectly healed over before the cuttings are planted, they will rot and decay: these should be planted in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tan, being careful that they have little wet, until they have made good roots; some of them may be placed in a dry stove, and others plunged into the tan bed in the bark stove, where they will make the greatest progress, and produce more flowers than the others.

ARUM ÆTHIOPICUM. See *Calla*.

ARUM SCANDENS. See *Dracontium*.

ARUNDO. *Lin. Gen. Plant.* 76. The Reed.

The Characters are,

It is of the grass tribe; the flowers grow in spikes, and are included in a chaff which opens with two valves. The petals of the flowers are bivalve, having a down at their base, and hath three hairy stamina: in the center is situated an oblong germen, with two slender styles. The germen afterward becomes an oblong pointed seed, with long down adhering to its base.

The Species are,

1. ARUNDO *calycibus quinquefloris paniculâ laxâ*. *Prod. Leyd.* 66. The common Marsh Reed.

2. ARUNDO *calycibus trifloris paniculâ diffusâ*. *Prod. Leyd.* 66. The manured Reed, or *Donax* of *Dioscorides*; this is sometimes called by gardeners the Ever-green Reed.

3. ARUNDO *Indica Laconica versicolor*. *Mor. Hist.* 3. p. 219. The Indian variegated Reed of *Theophrastus*.

4. ARUNDO *caule arboreo foliis acuminatis sulcatis, basi rotundioribus*. Another species of *Bambu*.

5. ARUNDO *caule arboreo foliis utrinque acuminatis*. Reed with a tree-like stalk, and leaves which are pointed at both ends.

6. ARUNDO *Orientalis tenuifolia caule pleno ex quâ Turcæ calamos parant*. *Tourn. Cor.* 39. Eastern Reed with a narrow leaf and a full stalk, of which the *Turks* made their writing pens.

The first sort is so very common by the sides of rivers and large standing waters in divers parts of *England*, that it is needless for me to say any thing of its culture. This is cut in autumn, when the leaves begin to fall, and the stems are changed brown, for making hedges in kitchen gardens, and for many other uses.

The second sort, although a native of a warm country, yet will bear our cold of the severest winters, in the open ground; it dies to the surface in autumn, and rises again the succeeding spring; and if kept supplied with water in dry weather, will grow ten or twelve feet high the same summer. This is propagated by parting the roots early in the spring, before they begin to shoot, and will, in a year or two, if the ground be good, make very large stools.

stools, from each of which you may have twenty or thirty large canes produced.

The stalks of this sort are brought from *Portugal* and *Spain*, and are used by the weavers, as also to make fishing rods.

The third sort is supposed to be a variety of the second, differing therefrom only in having variegated leaves. This plant will not grow so large, nor will it resist the cold so well, therefore will not live in the open air through the winter in *England*; so the plants must be kept in pots, and housed in the autumn.

The two sorts of *Bambu* are of great service to the inhabitants of *India*, who make most of their common utensils of the stems of these canes, which grow to a prodigious magnitude in those countries.

We have plants of the fourth sort in the *English* gardens, which are more than twenty feet high; and if the stoves in which they are kept were high enough to admit them, they would, according to appearance, rise to twice that height. Some of these stems are as large as a man's wrist, but in general as big as walking-sticks, and when dried are as fit for that purpose, as those which are imported. The leaves of this sort are much broader than those of the fifth, particularly at their base; these leaves are generally put round the tea-chests in their package, and are fastened together so as to form a kind of mat.

The fifth sort is more rare at present in *Europe*, though it is the most common on the coast of *Malabar*.

They are both tender plants, so will not live in this country, unless they are preserved in a warm stove; and as their roots spread very wide, so they should not be confined: therefore to have them produce strong stems, they must be planted in large tubs, filled with rich earth, and plunged into the tan bed in the bark stove; and as they naturally grow in marshy low places, so they require plenty of water, especially when the roots have filled the tubs in which they were planted. When the tubs decay, the boards may be removed, and the plants permitted to root into the tan, which will encourage them to grow to a larger size; but then there must be care taken when the bed is refreshed with new tan, to leave a sufficient quantity of old tan about the roots of the plants; for if they are too much bared, and the new tan laid near them, when that heats, it will scorch their roots, so that the plants are sometimes destroyed by it.

The sixth sort is what the *Turks* make their writing pens withal; this grows in a valley near mount *Athos*, as also on the banks of the river *Jordan*, but there are none of the plants in *England*. At present this sort may be managed as the *Bambu*.

ARUNDO SACCHARIFERA. See Saccharum.

ASARINA. *Tourn. Inst. R. H.* 171. tab. 76. Bastard Asarum.

The Characters are,

The flower is of one leaf, of the grinning kind, divided at the top into two lips, the upper one is divided into two parts. The lower lip is slightly cut into three obtuse parts; the two lips join close together, so as to form a kind of snout. It hath four stamina. In the center is placed a round germen, which afterward turns to a round husk, divided into two cells, which are full of roundish seeds.

The Species are,

1. ASARINA caule decumbente foliis oppositis reniformibus crenatis. Asarina, or Rock Ground-Ivy.
2. ASARINA caule erecto foliis lanceolatis amplexicaulibus paniculâ dichotomâ. Bastard Asarum with an upright stalk, spear-shaped leaves which embrace the stalks, and spikes of flowers coming out from the division of the branches.

The first sort is a low trailing annual plant, the branches extend little more than a foot each way, and are weak, so

that unless they are supported, they lie upon the ground; at the wings of the leaves the flowers come out singly on each side the stalk, which are shaped like those of Snap-dragon, but have a long tube; they are of a worn-out purple colour at the top, but below of an herbaceous colour. The seeds should be sown soon after they are ripe, or permitted to scatter, for when they are sown in the spring they seldom grow. The plants should remain where they are sown, and require no other care but to thin them where they grow too close. It grows naturally in *Italy* and the south of *France*.

The second sort grows naturally in *North America*. This plant hath upright stalks, which grow a foot and an half high, and put out several side branches; the leaves grow opposite, and embrace the stalks at their base; the flowers come out in short loose spikes from the divisions of the stalks, which are shaped like those of the former, but are less, and of a purple colour.

The seeds of this sort should be sown in the autumn, for those which are sown in the spring, seldom grow the same year, but remain in the ground till the following spring; the second year the plants will flower and perfect their seeds. The roots seldom last above two years, so that young plants should be annually raised.

ASARUM, Asarabacca.

The Characters are,

The flower hath no petals, but a thick coloured empalement and twelve short stamina. At the bottom of the empalement is inclosed a thick germen, which afterward turns to a thick capsule having six cells, containing several oval seeds.

The Species are,

1. ASARUM foliis reniformibus obtusis binis. *Lin. Sp. Plant.* 442. Common Asarabacca.
2. ASARUM foliis reniformibus mucronatis. *Lin. Sp. Plant.* 442. Canada Asarabacca.
3. ASARUM foliis cordatis obtusis glabris petiolatis. *Flor. Virg.* 162. *Virginia* Asarabacca, with round Pistolochia leaves marked like those of Sowbread.

The first sort hath thick fleshy roots which are jointed; the leaves grow singly upon short foot-stalks, arising immediately from the root; the flowers grow upon very short foot-stalks close to the ground, so are hid under the leaves. They have a bell-shaped empalement, of a worn-out purple colour, which is cut into three at the top, where it turns backward.

The leaves of the second sort are much larger than those of the first, and stand on longer foot-stalks; these are pointed and hairy. The flowers are like those of the other sort, growing close to the root, but are somewhat inclining to green on their outside, in all other respects they agree.

The third sort hath smooth blunt heart-shaped leaves, standing on long foot-stalks; these are veined, and spotted on their upper surface like those of the autumnal Cyclamen; the flowers of this are shaped like the others, but stand on longer foot-stalks, and are of a darker purple colour.

The first of these sorts is very common, and hath been found wild in some parts of *England*, though but rarely; it delights in a moist shady place, and is increased by parting the roots in autumn. This is the sort which is used in medicine.

The *Canada* sort is tolerably hardy, and will endure our common winters in the open ground, being rarely hurt but by great frosts, or being planted in a wet soil, which often occasions the roots to rot in winter. This is propagated as the other.

The third sort will live in the open air in *England*, being seldom injured by frost; but if the plants are too much exposed to the sun in summer, they seldom thrive well; therefore they should be planted in a border where they may have only the morning sun, in which situation they will spread and increase.

ASCLEPIAS, Hirundinaria, or Swallow-wort.

The Characters are,

The flower hath a petal of one leaf, divided into five oval parts. In the center is situated five nectariums which encompass the parts of generation; the stamina are joined in a truncated body inclosed by five scales, and are scarce visible. It hath two oval pointed germen, which afterward become two large oblong swelling pods ending in a point, which open with two valves, which are filled with compressed seeds, lying over each other like tiles on a house, and are crowned with a soft down.

The Species are,

1. ASCLEPIAS foliis ovatis acuminatis caule erecto umbellulis proliferis. *Lin. Sp. Plant.* 216. Common Swallow-wort with a white flower.

2. ASCLEPIAS foliis lanceolatis acutis caule superne subvolubili. *Lin. Sp. Pl.* 216. Swallow-wort with a black flower.

3. ASCLEPIAS foliis ovatis acutis caule infirmo, umbellis simplicibus. Narrow-leaved Swallow-wort with a yellow flower.

4. ASCLEPIAS foliis revolutis linearibus verticillatis caule erecto. *Lin. Sp. Pl.* 217. Upright Dogbane of Maryland, with narrow Toadflax leaves and flowers growing in an umbel.

5. ASCLEPIAS foliis ovalibus subtus tomentosus caule simplicissimo umbellis nutantibus. *Lin. Sp. Plant.* 214. Greater upright Syrian Dogbane.

6. ASCLEPIAS foliis ovatis subtus pilosiusculis caule simplicibus umbellis nectariisque erectis. *Lin. Sp. Plant.* 214. Dogbane with fine purple flowers and upright horns.

7. ASCLEPIAS foliis ovatis subtus villosis caule simplici umbellis erectis nectariis resupinatis. *Lin. Sp. Pl.* 214. Upright Dogbane of New York, with leaves less hoary, and a worn-out palish purple coloured flower.

8. ASCLEPIAS foliis ovatis rugosis nudis caule simplici umbellis subsessilibus pedicellis tomentosus. *Lin. Sp. Plant.* The old American Dogbane called Witank.

9. ASCLEPIAS foliis lanceolatis caule superne diviso umbellis terminalibus congestis. *Lin. Sp. Plant.* 215. Smaller upright Dogbane of Canada.

10. ASCLEPIAS foliis villosis caule decumbente. *Lin. Sp. Pl.* 216. Hairy Orange-coloured Dogbane of Carolina.

11. ASCLEPIAS foliis alternis lanceolatis caule divaricato piloso. *Lin. Sp. Pl.* 217. Hairy New England Dogbane with a tuberose root, and an Orange-coloured flower, commonly called Orange Apocynum.

12. ASCLEPIAS foliis lineari-lanceolatis glabris caule fruticoso umbellis lateralibus. Upright African Dogbane with a hairy fruit, and a narrow, smooth, Willow leaf.

13. ASCLEPIAS foliis lanceolatis glabris umbellis simplicibus lateralibus caule fruticoso. Upright African Dogbane with a broad, smooth, Willow leaf.

14. ASCLEPIAS foliis lanceolatis villosis acutis umbellis simplicibus erectis caule fruticoso. Upright African Dogbane with hairy fruit, and a broad hairy Willow leaf and hairy fruit.

15. ASCLEPIAS caule erecto fruticoso, foliis subrotundis amplexicaulis, umbellis congestis. Upright shrubby Dogbane with a roundish sea-green leaf.

16. ASCLEPIAS foliis lanceolatis glabris caule simplici umbellis erectis lateralibus solitariis. *Lin. Sp. Pl.* 215. American Dogbane with longer Almond leaves.

17. ASCLEPIAS foliis lanceolatis petiolatis glabris caule simplici umbellis erectis solitariis. *Lin. Sp. Pl.* 215. Dogbane with a fibrous root, and scarlet petals with Saffron-coloured horns, called Bastard Ipecacuana.

18. ASCLEPIAS foliis amplexicaulis oblongo-ovalibus. *Flor. Zeyl.* 112. Greater upright broad-leaved Indian Dogbane, and the *Beid el ossar.* *Alp. Ægypt.* 85.

19. ASCLEPIAS foliis ovato-lanceolatis glabris caule simplici umbellis erectis terminalibus. Upright Dogbane with oblong pointed leaves, and white flowers growing in an umbel.

The first sort is the common Swallow-wort of the shops. This is called Vincetoxicum and Hirundinaria, in *Engliso* Swallow-wort, or tame Poison, from its supposed virtue, being accounted a mighty counter poison. The root is the only part which is used, which is composed of many strong fibres, connected at the top, like those of Asparagus, from which arise many stalks, in number proportional to the size of the roots; which grow two feet high, and are very slender at the top; the leaves are placed opposite by pairs. The flowers are white, growing in umbels near the top of the stalk, from which are sent out smaller umbels. After the flower is past, the two germen become two long pointed pods, inclosing many compressed seeds, which are crowned with a soft white down. It flowers in *June*, and the seeds ripen in *September*. It grows naturally in the south of *France*, *Spain*, and *Italy*.

The second sort agrees with the first, in the shape of its roots, leaves, and flowers, but the stalks extend to a greater length, and toward their upper part twist round any sticks, or other plants near it, and the flowers of this are black.

The third differs from both the other in the narrowness of its leaves, and weakness of its stalks; the umbels of flowers are single, and of a yellow colour. There is a variety of this with broader leaves, which may have come from the seeds of this.

These plants are generally propagated by parting their roots, especially the first sort, which seldom produces seeds in *England*. The best time for this is in autumn, when their stalks begin to decay. They should not be planted nearer together than three feet, for the fibres of their roots extend to a considerable distance. They are very hardy plants, so will thrive in any situation, but love a dry soil.

The fourth sort grows naturally in *North America*. This rises with slender upright stalks, which are garnished with very narrow leaves, growing in whorles: at the top of the stalks grow umbels of small, white, starry flowers, which appear in *July*, but are never succeeded by pods in *England*, so are only propagated by parting of the roots, which should be done in the spring before they put out new shoots.

The fifth sort creeps greatly at the root; this sends up strong stems upward of five feet high, which have thick oval leaves placed opposite, and hoary on their under sides. Towards the top of the stalks the umbels of flowers come out on the side; these are of a worn-out purple colour, smelling sweet, and nod downward; sometimes they are succeeded by large oval pods, filled with flat seeds, crowned by a long soft down. This propagates fast enough by its creeping root, and will grow in any soil or situation. It may be transplanted any time after the stalks decay, and before the roots shoot in the spring.

The sixth sort hath a perennial root, which sends up several upright stalks in the spring, about two feet high, garnished with oval leaves growing opposite; at the top of the stalks the umbels of flowers are produced, which are of a bright purple colour, making a pretty appearance, but are not succeeded by pods in *England*; this must be treated as the fourth sort.

The seventh sort grows naturally in *North America*. This hath a perennial root, which sends out single stalks, near three feet high, which have oval leaves placed opposite; the flowers grow in erect umbels at the top, and the nectariums are declining. It is very hardy, and propagates fast by its creeping roots, but never produces seeds in *England*.

The eighth sort resembles the seventh, but the leaves are rough, and the umbels of flowers are more compact, and come out on the side of the stalk; these are of an herbaceous colour: it is propagated by roots as the former sort.

The ninth sort came first from *Canada*, but hath since been found growing naturally in several other parts of *America*. It

hath a perennial root, which puts out several upright stalks about two feet high, with oblong smooth leaves placed by pairs; at the top are produced close umbels of purple flowers. It is propagated by parting of the roots, which do not increase very fast, so that it is not very plenty in the gardens; but it is hardy enough to live abroad, if it is planted in a dry soil.

The tenth sort is a native of *North America*, but is hardy enough to live abroad in *England*, if it is planted in a warm situation, and in a dry soil. This hath declining stalks, which are a foot and an half long, and hairy; the leaves are narrow, hairy, and placed opposite; the umbels grow at the extremity of the branches, which are compact, and the flowers are of a bright Orange colour. It is propagated by seeds, which should be sown upon a hot-bed to bring up the plants. When they are of a proper strength to remove, they should be shaken out of the pots, and planted in a warm border a foot asunder, being careful to shade them from the sun, until they have taken fresh root, but they must have very little water given them, for they are milky plants, which rot with much wet. When their stalks decay in autumn, some rotten tan should be laid over the ground to keep out the frost, which should be removed in the spring before the plants put out new shoots. The second spring the roots may be transplanted where they are to remain; the roots will then be strong enough to flower in summer, and will last several years, especially if they are covered with tan to keep out the frost in winter, but they should not be afterward removed; for when the roots are large, they will not bear transplanting.

The eleventh sort is a native of the same countries, and is much like the former, but differs in having upright stalks, and the leaves growing alternate. The roots of this grow to a large size, so will not bear transplanting. It is propagated by seeds, which should be treated in the manner directed for the former. These flower the latter end of *July*, and in *August*. Neither of these plants will live long in pots, for which reason I have recommended their being planted in the full ground; but they should have a warm situation.

The twelfth, thirteenth, and fourteenth sorts grow naturally at the *Cape of Good Hope*. These rise with upright shrubby stems to the height of eight or ten feet, and divide into many branches. The flowers of all the sorts are white, and grow loosely on the umbel; these are frequently succeeded by short, thick, swelling pods, ending in a point, which are thick set with hairs, and are filled with compressed seeds, crowned with a soft down.

The thirteenth sort differs from the twelfth, in having much broader leaves, which are of a darker green; the umbels of flowers are smaller, grow upon shorter foot-stalks, and the single flowers are larger.

The fourteenth sort doth not rise so high as either of the former, and the branches grow at a much greater distance; the leaves are shorter, and are covered on both sides with short hairs.

These are propagated by seeds, which may be sown in *April* on a bed of light earth in the open air; and when the plants are three or four inches high, they should be each planted in a small pot filled with light earth, and shaded until they have taken new root, then they may be placed with other exotic plants in a sheltered situation; in *October* they must be removed into the green-house, and during the winter should have but little water, for as they abound with a milky juice, much wet will rot them.

These three sorts may also be propagated by cuttings, which, if planted in *July* or *August*, in a shady border, will soon take root, and may then be taken up and planted in pots, and managed as the seedling plants. The thirteenth sort has lived in the open air in mild winters in the *Chel-*

sea garden, but in cold winters they are constantly destroyed.

The fourteenth sort grows with an upright shrubby stalk to the height of six or seven feet, dividing toward the top into three or four branches, with stiff roundish leaves, which closely embrace them. Toward the upper part, the flowers are produced on their sides, growing in short compact umbels. They are of an herbaceous colour, and make but little appearance; they come out chiefly in autumn and winter. This requires the same culture as the former sorts.

The fifteenth sort grows naturally in the warm parts of *America*. - This rises with single stalks near two feet high, which are garnished with smooth spear-shaped leaves, ending in a point; toward the top of the stalk the umbels of flowers are produced from the wings of the leaves, which are white, and stand erect; and are succeeded by oblong pointed pods, filled with compressed seeds, crowned with soft down. It flowers in *June* and *July*, and the seeds ripen in *October*.

This plant is tender, so must be raised in a hot-bed, and constantly remain in the stove, otherwise the plants will not thrive here.

The sixteenth sort is also a native of the warm parts of *America*, the roots of which have been sent to *England* for *Ipecacuana*. There have been many accounts of the bad effects of the use of these roots, as also of the poisonous quality of the plant, so that the publick should be cautioned not to make use of it, and also to be careful not to let the milky juice of the plant mix with any thing which is taken inwardly.

The plant rises five or six feet high, with upright stems, and smooth oblong leaves placed opposite; toward the top of the branches, the umbels of flowers come out, which stand erect; the petals of the flowers are of a scarlet colour; and the horny nectariums in the middle are of a bright Saffron colour, which make a pretty appearance; there is commonly a succession of these flowers on the same plant, from *June* to *October*. The flowers are succeeded by long taper pods filled with seeds crowned by a soft down, which ripen late in the autumn.

It is propagated by seeds, which must be sown on a hot-bed in the spring; and the plants should be treated in the same manner, as is before directed for the former sort; the roots of this sort may be continued three or four years, but after the second year, the plants grow naked, and do not produce so many flowers as the young plants.

The seventeenth sort rises with upright stems, six or seven feet high, with thick oval leaves placed opposite. The umbels of flowers are produced from the wings of the leaves; the flowers are white, of a star figure, having five points; the pods of this sort are very large, in shape like an ox's testicles, and are filled with flat seeds lying over each other, like tiles on a house.

This plant is tender, so must be preserved constantly in the stove, and treated in the same manner as the two former sorts, and should have very little wet, especially in the winter.

The eighteenth sort approaches near to the fifteenth, from which it differs in the leaves, being broader, and the umbels of flowers terminating the stalks, whereas those of the fifteenth are produced at the wings of the leaves. This is tender, so must be managed as the fifteenth sort. It flowers in *August*, and the seeds ripen in *October*.

The nineteenth sort I received from *Carthage*; this hath climbing stalks, which fasten themselves to the neighbouring plants, and rise to the height of ten or twelve feet, with spear-shaped hairy leaves, growing opposite upon very short foot-stalks; the umbels of flowers, come out from the wings of the leaves, which are very compact, and the flowers are of a sulphur colour.

This plant is tender, so must be constantly preserved in the stove, and treated in the same way as is directed for the former sorts.

ASCYRUM. *Lin. Gen. Plant.* 737. St. Peterwort.

The Characters are,

The flower hath four oval petals, the two outer are large and placed opposite, the two inner are small. In the center is situated an oblong germen, attended by a great number of bristly stamina, which are reduced at their base to four bodies. The germen afterward becomes an oblong pointed seed-vessel, filled with small round seeds.

The Species are,

1. ASCYRUM *foliis ovatis caule tereti paniculâ dichotomâ. Lin. Sp. Pl.* 787. Bastard St. Johnswort of Maryland, with small yellow flowers called St. Andrew's Crosses.

2. ASCYRUM *foliis hirsutis caule stricto. Lin. Sp. Pl.* 788. Shrubby hairy St. Johnswort of Virginia.

3. ASCYRUM *foliis ovatis caule compresso. Lin. Sp. Plant.* 788. Upright shrubby Bastard St. Johnswort with a yellow flower.

The first sort is a low plant, whose stalks seldom rise more than six inches high; these have small oval leaves, placed by pairs; the stalks are slender, and divide into two toward the top. From between the division of the branches, the loose spikes of flowers are produced, which are yellow, but very small, so make no appearance; therefore the plant is scarce worthy of a place in gardens, but for the sake of variety. The root is perennial, and the plant may be propagated by laying down its branches; it loves a moist soil, and a shady situation.

The second sort grows about three feet high, with upright stalks, and hairy oblong leaves; the flowers are produced at the ends of the stalks, which are of the shape and colour with common St. Johnswort, but have only four leaves. This hath a perennial root, but the stalks decay every autumn. It may be propagated by parting the roots in autumn, when the stalks decay, and should be planted in a loamy soil.

The third sort grows naturally in *South Carolina*. This plant rises a foot and an half high, with flat stalks, which are garnished with oval smooth leaves growing opposite; the stalks are terminated by three or four yellow flowers, growing close together, which are larger than those of the common St. Johnswort, and the petals of the flowers are hollow. It may be propagated by cuttings, made of the young shoots in *May*; which, if planted in pots, and plunged into a very moderate hot-bed, will take root in five or six weeks, when they may be transplanted into a warm border, where they will endure the cold of our ordinary winters.

These plants have little beauty, so are seldom cultivated but in botanick gardens, for the sake of variety.

ASCYRUM BALEARICUM.

ASCYRUM MAGNO FLORE. } See Hypericum.

ASCYRUM VULGARE.

ASH TREE. See Fraxinus.

ASPALATHUS. *Lin. Gen. Plant.* 767. African Broom.

The Characters are,

The flower is of the butterfly kind. The standard is hairy, compressed, and blunt pointed; the wings are blunt, moon-shaped, and spread open, and are shorter than the standard; the keel is bifid, and of the same length as the wings. In the bottom is situated an oval germen, which afterward becomes an oval oblong pod, inclosing one or two, kidney-shaped seeds.

The Species are,

1. ASPALATHUS *foliis confertis subulatis mucronatis bispidis floribus capitatis. Lin. Sp. Pl.* 711. Yellow African Broom, with hairy flowers collected in woolly heads, and prickly Asparagus leaves which are hairy.

2. ASPALATHUS *foliis quinatis sessilibus. Lin. Sp. Pl.* 712.

Indian shrubby Trefoil, with single red flowers, an oblong foot-stalk, and a small pod.

3. ASPALATHUS *foliis trinis linearibus sericeis stipulis simplicibus mucronatis floribus sparsis tomentosis. Lin. Sp. Pl.* 713. Narrow-leaved African silvery Cytisus, with a silky down and flowers in a spike like a hare's foot.

These plants grow naturally about the *Cape of Good Hope*. The first is a low shrub growing about three feet high, with slender branches, having many trifoliate leaves growing in clusters; at the ends of the branches the flowers come out, which are yellow, collected in woolly heads; these are rarely succeeded by pods in *England*. It is propagated by seeds, which must be obtained from the country where the plants grow naturally; it should be sown in pots filled with light earth as soon as they arrive: if this happens in the autumn, the pots should be plunged into an old tan bed whose heat is spent, where they may remain till spring, when they should be removed into a moderate hot-bed, which will bring up the plants. But when the seeds arrive in the spring, the pots in which the seeds are sown should be then plunged into a moderate hot-bed. Those seeds which are sown in the spring, seldom grow the same year; therefore in the autumn, the pots should be put into an old tan bed, as was directed for those sown in autumn, and afterward put on a hot-bed the following spring. When the plants come up, and are strong enough to remove, they should be each planted into a separate small pot filled with light earth, and plunged into a moderate hot-bed, to encourage their rooting again; and so soon as they are established in the pots, they should by degrees be inured to the open air, into which they should be removed in summer, placing them in a sheltered situation, where they may remain till autumn, when they must be carried into the green-house, and in winter should have but little water.

The second sort grows about five feet high, with slender branches, which are garnished with leaves growing by fives close to the branches; the flowers come out singly upon long foot-stalks, which are of a pale red colour. This is propagated as the former, and requires the same treatment.

The third sort rises about four feet high, with a shrubby stalk dividing into slender branches, with silky white leaves, coming out by threes; the flowers are yellow, downy, and grow thinly on the branches. This is propagated as the two former, and must be treated in the same way as is directed for the first sort. It flowers late in the summer.

ASPARAGUS, Asparagus, Sparagus, or Sperage; corruptly called Sparrowgrafs.

The Characters are,

The flower is naked, having no empalement, and is of the bell-shaped kind spread open and reflexed at the top. These are male and hermaphrodite, sometimes in different plants, and at other times on the same stalks. The hermaphrodite flowers have a germen, which afterward becomes a round berry having three cells; in each of them is lodged one or two seeds. The male flowers have six stamina, but no germen or style, nor are succeeded by any berries.

The Species are,

1. ASPARAGUS *caule herbaceo erecto, foliis setaceis, stipulis paribus. Flor. Suec.* 272. Garden Asparagus.

2. ASPARAGUS *caule inermi herbaceo foliis teretibus longioribus fasciculatis.* Maritime Asparagus with a thicker leaf.

3. ASPARAGUS *foliis aciformibus pungentibus caule fruticoso inermi. Sauv. Monf.* 45. Asparagus with sharp pointed leaves.

4. ASPARAGUS *aculeis solitariis ramis flexuosis foliis brevioribus fasciculatis.* Prickly Asparagus with horrid spines.

5. ASPARAGUS *aculeis solitariis ramis reflexis retrofractisque, foliis fasciculatis. Lin. Sp. Pl.* 313. Narrow leaved African Asparagus with slender twigs, and many leaves growing

from a point like those of the Larch tree, and spread in form of a star.

6. *ASPARAGUS aphyllus spinis fasciculatis inæqualibus divergentibus.* Hort. Cliff. 122. Another prickly Asparagus, with three or four spines rising from the same point.

7. *ASPARAGUS caule iuxta ramis declinatis foliis fetaceis.* Prod. Leyd. 29. Asparagus with a smooth stalk, declining branches, and bristly leaves.

8. *ASPARAGUS aculeis solitariis caule erecto foliis fasciculatis, ramis filiformibus.* Lin. Sp. Plant. 313. Asparagus with single spines, an upright stalk, leaves growing in clusters, and very slender branches.

9. *ASPARAGUS spinis lateralibus terminalibusque, ramis aggregatis foliis fasciculatis.* Lin. Sp. Pl. 314. Asparagus with spines growing on the sides and ends of the branches, which are in bunches, and leaves coming out in clusters.

10. *ASPARAGUS foliis solitariis lineari lanceolatis caule flexuoso aculeis recurvis.* Flor. Zeyl. 124. The great prickly Asparagus of Ceylon, with bushy stalks.

The first sort is the common Asparagus, which is cultivated for the use of the table, and may have probably been brought by culture to the perfection it now is, from the wild sort, which grows naturally in the fens of *Lincolnshire*, where the shoots are no larger than straws; but if so, it must have been from very long culture and good management; for a friend of mine, who procured some seeds of the wild sort, which he cultivated with great care, in very rich ground, yet could not bring the roots to produce shoots more than half the size of the garden kind, which grew on the same ground; but he always found the wild sort came up a week or ten days earlier in the spring, and the shoots were exceeding sweet.

This Asparagus is propagated by seeds, in the procuring of which, there should be particular care to get it from a person of skill, who may be depended upon for his choice of the shoots, and integrity in supplying with the best seeds. But where a person is in possession of some good beds of Asparagus, it is much the best way to save it himself; in order to which, a sufficient number of the fairest buds should be marked early in the spring, and permitted to run up for seeds; because those which run up after the season for cutting the Asparagus is over, are generally so backward, as not to ripen the seeds unless the summer is warm, and the autumn very favourable. In the choice of the buds to be left for seeds, there must great regard be had to their size and roundness, never leaving any that are inclinable to be flat, or that soon grow open-headed, always choosing the roundest, and such as have the closest tops. But as several of these produce only male flowers which are barren, so a greater number of buds should be left, than might be necessary, if there could be a certainty of their being all fruitful, but this never happens. When the buds are left, it will be proper to thrust a stake down by each, but there must be care had in the doing of this, not to injure the crown of the root. These stakes will not only serve as marks to distinguish them from the others when they are all run up, but also to fasten the shoots to, when they are advanced in height, and put out lateral branches; to prevent their being broken by wind, which frequently happens where this is not observed; before the other shoots are permitted to run up, after which there is little danger of it, because they will then be screened by the other stalks. Toward the end of *September* the berries will be fully ripe, when the stalks should be cut off, and the berries stripped in a tub, in which they may remain three weeks or a month to sweat, by which means the outer husks will be rotten; then fill the tub with water, and with your hands break all the husks by squeezing them between your hands. These husks will all swim upon the water, but the seeds will sink to the bottom; so that by pouring off the

water gently, the husks will be carried along with it; and by putting fresh water two or three times, and stirring your seed about, you will make it entirely clean: then spread your seed upon a mat or cloth, and expose it to the sun and air in dry weather, until it is perfectly dry; when you may put it into a bag, and hang it up in a dry place till the beginning of *February*; at which time you must prepare a bed of good rich earth made very level, whereon you must sow your seeds (but not too thick, which will cause your plants to be small); then tread the bed all over to bury your seed in the ground, and rake it over smooth.

In the following summer, keep it diligently cleared from weeds, which will greatly add to the strength of your plants; and toward the latter end of *October*, when the haulm is quite withered, you may spread a little rotten dung over the surface of the ground, about an inch thick, which will preserve the young buds from being hurt with the frosts, &c.

The spring following, your plants will be fit to plant out for good (for I would never choose plants of more than one year's growth, having very often experienced them to take much better than older, and to produce finer roots): you must therefore prepare your ground by trenching it well, burying therein a good quantity of rotten dung at the bottom of each trench, that it may lie at least six inches below the surface of the ground; then level your whole plot very exactly, taking out all large stones: but this should not be done long before you intend to plant your Asparagus, in which you must be governed according to the nature of your soil or the season; for if your soil is dry and the season forward, you may plant toward the end of *March*; but in a very wet soil, it is better to wait till the middle of *April*, which is about the season that the plants are beginning to shoot. I know many people have advised the planting of Asparagus at *Michaelmas*, but this I have experienced to be very wrong; for in two different years I was obliged to transplant large quantities at that season, but I had better have thrown away the plants, for upon examination in the spring, I found most of the roots were grown mouldy, and decaying; and I am sure, not one in five of them succeeded, and those which did were so weak, as not to be worth their standing.

The season being now come for planting, you must with a narrow pronged dung-fork, carefully fork up your roots, shaking them out of the earth, and separating them from each other; observing to lay their heads even, for the more convenient planting them, which must be performed in this manner:

Your plot of ground being levelled, you must begin at one side thereof, ranging a line very tight cross the piece; by which you must throw out a trench exactly strait, and about six inches deep, so as not to turn up the dung, into which you must lay your roots, spreading them with your fingers, and placing them upright against the back of the trench, that the buds may stand forward, and be about two inches below the surface of the ground, and at twelve inches distance from each other; then, with a rake, draw the earth into the trench again, laying it very level, which will preserve the roots in their right position; then remove your line a foot farther back, and make another trench in the like manner, laying therein your plants as before directed, and continuing the same distance row from row; only observing between every four rows, to leave a distance of two feet and an half, for an alley to go between the beds to cut the Asparagus, &c.

Your plot of ground being finished and levelled, you may sow thereon a small crop of Onions, which will not hurt your Asparagus, and tread in your seeds, raking your ground level.

There are some persons who plant the seeds of Asparagus in the place where the roots are to remain, which is a very good method, if it is performed with care. The way is this:

this: After the ground has been well trenched and dunged, they lay it level, and draw a line cross the ground (in the same manner as is practised in planting of the young plants); then with a dibble make holes at a foot distance, into each of which you must drop two seeds, for fear one should miscarry; these holes should not be more than half an inch deep; then cover the seeds, by striking the earth in upon it, and go on removing the line a foot back for another row; and after four rows are finished, leave a space for an alley between the beds, if it is designed to stand for the natural season of cutting; but if it is to be taken up for hot-beds, there may be six rows planted in each bed, and the distance in the rows need not be more than nine inches. This should be performed by the middle of *February*, because the seeds lie long in the ground; but if Onions are intended to be sown upon the ground, that may be performed a fortnight or three weeks after, provided the ground is not stirred so deep as to disturb the Asparagus seeds, in raking the Onion seed into the ground.

As the roots of Asparagus always send forth many long fibres which run deep into the ground, so when the seeds are sown where they are to remain, these roots will not be broken or injured, as those must be which are transplanted; therefore they will shoot deeper into the ground, and make much greater progress, and the fibres will push out on every side, which will cause the crown of the root to be in the center; whereas in transplanting, the roots are made flat against the side of the trench.

When your Asparagus is come up, and the Onions have raised their seed leaves upright (which will be in a month or six weeks after planting), you must with a small hoe cut up all the weeds, and thin your crop of Onions where they may have come up in bunches: but this must be done carefully, and in dry weather, that the weeds may die as fast as they are cut up, being careful not to injure the young shoots of Asparagus, as also to cut up the Onions which grow near the shoots. This work must be repeated about three times, which, if well done, and the season not too wet, will keep the ground clear from weeds until the Onions are fit to be pulled up, which is commonly in *August*, and is known when their greens fall down and begin to wither. When you have drawn off your Onions, you must clean your ground well from weeds, which will keep it clean till you earth the beds; which must be done in *October*, when the haulm begins to decay; for if you cut off the haulm while green, the roots will shoot fresh again, which will greatly weaken them. This young haulm should be cut off with a knife, leaving the stems two or three inches above ground, which will be a guide for you to distinguish the beds from the alleys; then with a hoe clear off the weeds into the alleys, and dig up the alleys, burying the weeds in the bottom, and throw the earth upon the beds, so that the beds may be about five inches above the level of the alleys: then you may plant a row of Coleworts in the middle of the alleys, but do not sow or plant any thing upon the beds, which would greatly weaken your roots; nor would I ever advise the planting of Beans in the alleys (as is the practice of many) for it greatly damages the two outside rows of Asparagus. In this manner it must remain till spring, when you must hoe over the beds to destroy all young weeds; then rake them smooth, and observe all the succeeding summer to keep them clear from weeds, and in *October* dig up the alleys again, as was before directed, earthing the beds, &c.

The second spring after planting, you may begin to cut some of your Asparagus, though it will be much better to stay until the third; therefore now you must fork up your beds with a flat pronged fork, made on purpose, which is commonly called an Asparagus fork: this must be done before the buds shoot in the spring, and with care, lest you

fork too deep, and bruise the head of the root; then rake the beds over smooth, just before the buds appear above ground, which will destroy all young weeds, and keep your beds clean much longer than if left unraked, or done so soon as forked; and when your buds appear about four or five inches above ground, you may then cut them, but it should be done sparingly, only taking the large buds, and suffering the small to run up to strengthen the roots; for the more you cut, the greater will be the increase of buds, but they will be smaller and the roots sooner decay. When you cut a bud, you must open the ground with your knife (which should be very narrow and long in the blade, and filled with teeth like a saw) to see whether any more young buds are coming up close by it, which might be either broken or bruised in cutting the other, then with your knife saw it off about three inches under ground. This may appear a very troublesome affair to people unacquainted with the practical part, but those who are employed in cutting Asparagus, will perform a great deal of this work in a short time; but care in doing it is absolutely necessary to be observed by all who cut Asparagus.

The manner of dressing your Asparagus beds is every year the same as directed for the second, *viz.* clearing them from weeds, digging the alleys in *October*, and forking the beds toward the end of *March*, &c. only observe every other year to lay some rotten dung (from a Melon or Cucumber bed) all over your beds, burying some in the alleys also, at the time for digging them up. This will preserve the ground in heart to maintain your roots in vigour, and by this management, a plot of good Asparagus may be continued for ten or twelve years in cutting, and will produce good buds, especially if it is not cut too long each season; for when it is not left to run up pretty early in *June*, the roots will be greatly weakened, so the buds will be smaller: therefore, in those families where Asparagus is required late in the season, a few beds should be set apart for that purpose, which will be much better than to injure the whole plantation, by cutting it too long.

I cannot help taking notice of a common error that has long prevailed with most people, which is, that of not dunging the ground for Asparagus, believing that the dung communicates a strong rank taste to the Asparagus; which is a great mistake, for the sweetest Asparagus is that which grows upon the richest ground, and poor ground occasions that rank taste, so often complained of; the sweetness of Asparagus being occasioned by the quickness of its growth; which is always proportionable to the goodness of the ground, and the warmth of the seasons: but in order to prove this, I planted two beds of Asparagus, upon ground which had dung laid a foot thick; and these beds were every year dunged extremely thick, and the Asparagus produced from these beds was much sweeter than any I could procure, though they were boiled together in the same water.

The quantity of ground necessary to be planted with Asparagus, to supply a small family, should be at least five or six rods, less than that will not do; for if you cannot cut one hundred at a time, it will scarcely be worth while; for you must be obliged to keep it after it is cut two or three days, to furnish enough for one mess; but for a larger family, twelve rods of ground should be planted, which, if a good crop, will furnish two or three hundred each day in the height of the season.

But as there are several people who delight in having early Asparagus, which is become a very great trade in the kitchen gardens near *London*, I shall give proper directions for the obtaining it any time in winter.

You must first be provided with a quantity of good roots (either of your own raising, or purchased from such gardeners as plant for sale), that have been two or three years planted.

planted out from the seed bed; and having fixed upon the time you would willingly have your Asparagus fit to cut, about six or seven weeks before, you should prepare a quantity of new stable horse-dung, which should be thrown in a heap for ten or twelve days to ferment, mixing some sea-coal ashes with it; it should be turned over to mix it well, then it will be fit for use. Then dig out a trench in the ground where you intend to make the bed, the width of the frames that are designed to cover it, and the length in proportion to the quantity you intend to have (which if designed only to supply a small family, three or four lights at a time will be sufficient): then lay down your dung into the trench, working it very regularly, and beat it down very tight with a fork, laying it at least three feet in thickness or more, when the beds are made in *December*; then put your earth thereon about six inches thick, breaking the clods and laying it level; and at one end, begin laying your roots against a little ridge of earth, raised about four inches high: your roots must be laid as close as possible one to the other, in rows, with their buds standing upright; and between every row lay a small quantity of fine mould, observing to keep the crown of the roots exactly level. When you have finished laying your bed with roots, you must lay some stiff earth up to the roots, on the outsides of the bed, which are bare, to keep them from drying; and thrust two or three sharp pointed sticks, about two feet long, down between the roots, in the middle of the bed, at a distance from each other. The use of these sticks is to let you know what temper of heat your bed is in, which you may find by drawing up the sticks, and feeling the lower part; and if, after the bed has been made a week, you find it doth not heat, you may lay a little straw or litter round the sides, or upon the top, which will greatly help it; and if you find it very hot, so as to endanger scorching of the roots, it will be advisable to let it remain wholly uncovered, and to thrust a large stick into the dung, on each side of the bed, in two or three places, to make holes for the great steam of the bed to pass off, which in a short time will reduce the bed to a moderate heat.

After your bed has been made a fortnight, you must cover the crowns of the roots with fine earth, about two inches thick; and when the buds appear above ground through that earth, you must again lay on more earth, about three inches thick; so that in the whole, it may be five inches above the crowns of the roots, which will be sufficient.

Then you must make a band of straw (or long litter), about four inches thick, which you must fasten round the sides of the bed, that the upper part may be level with the surface of the ground: this must be fastened with strait sticks about two feet long, sharpened at the points, to run into the bed; and upon this band you must set your frames, and put your glasses thereon; but if, after your bed hath been made three weeks, you find the heat decline, you must lay a good lining of fresh hot dung round the sides of the bed, which will add a fresh heat thereto; and in bad weather, as also every night, keep the glasses covered with mats and straw; but in the day time, let it be all taken off, especially whenever the sun appears; which, shining through the glasses, will give a good colour to the Asparagus.

A bed thus made, if it works kindly, will begin to produce buds, for cutting, in about five weeks after it is made, and will hold about three weeks in cutting; which, if rightly planted with good roots, will produce, in that time, about three hundred buds in each light; so that, if you would continue your Asparagus until the season of the natural being produced, you must make a fresh bed every three weeks, until the beginning of *March*, from the season of your first bed being made; for if your last bed is made about a week in *March*, it will continue till the season of natural Asparagus; and the last beds will come a fortnight sooner to cut

than those made about *Christmas*; and the buds will be larger, and better coloured, as they will then enjoy a greater share of the sun.

If you intend to follow this method of forcing early Asparagus, you must keep planting every year a quantity, which you shall judge necessary (unless you intend to buy the roots from some other garden); the quantity of roots necessary to plant one light, is commonly known by the measure of the ground where they grow; for in a good crop, where few roots are missing, one rod of ground will furnish enough for a light; but this calculation is made from the ground planted with roots, which are designed to be taken up after two or three years growth for forcing, in which there are six rows in a bed, at but ten inches distance, and the plants eight or nine inches asunder in the rows; but where there is a greater space between the rows, and fewer rows in a bed, then there must be a greater quantity of ground allotted for each light. Most of the kitchen gardeners about *London*, take up their Asparagus roots after two years growth from planting; but where the land is not very good, it will be better to let it have three years growth, for if the roots are weak, the buds of Asparagus will be very small, so not worth the trouble of forcing. The best ground for planting Asparagus, to have large roots for hot-beds, is a low moist rich soil; but for those that are to remain for a natural produce, a middling soil, neither too wet nor too dry; but a fresh sandy loam, when well dunged, is preferable to any other.

The second sort is mentioned to grow naturally in *Wales*, and also near *Bristol*, but this I have great doubts about; for those who have mentioned it, say it does not differ from the garden kind, which is only altered by culture. But I have lately received specimens of this, which were gathered near *Montpelier*, by which I am convinced that it is a different species from that which grows in *Wales*, for the leaves of the wild maritime kind, are taper and thick, and are thinly placed on their branches, nor do the stalks branch out so much.

This sort is propagated by seeds in the same manner as the garden kind, but must have a warmer situation, and the roots should be well covered in winter, to prevent the frost from penetrating of the ground, which will destroy it.

The third sort hath white crooked shrubby stalks, which rise six or eight feet high, but have no spines on them; the leaves come out in clusters from the same point, like those of the Larch tree; these are very short, and end in sharp prickles, so that they are troublesome to handle. This sort grows naturally in the south of *France*, *Spain*, and *Portugal*. It is propagated by seeds as the former sorts, but is too tender to live abroad in *England*, so the roots should be planted in pots, and sheltered in winter.

The fourth hath shrubby stalks, three or four feet high, with very white bark, and are armed with thorns which are single, coming out just below each tuft of leaves. These stalks continue several years, and put out many branches, which are garnished with narrow short leaves. These continue green all the winter, if the plants are screened from severe frost.

It is propagated by seeds as the former, which may be procured from the *Mediterranean*, where it grows naturally; the plants should be kept in pots, that they may be sheltered in winter.

The fifth sort grows naturally at the *Cape of Good Hope*. This hath very crooked irregular stalks, which rise eight or ten feet high, and are shrubby, putting out several side branches, which are weak. These have long narrow leaves coming out in clusters like those of the Larch tree; under each of these clusters is placed a single sharp thorn. The stalks continue several years, and the leaves keep green all the year. It is commonly propagated by parting of the roots, because the plants do not seed in this country; the best time

time for this is in *April*. The roots must be planted in pots, and removed into the green-house in autumn, for these plants will not live abroad in *England*.

The sixth sort grows naturally in *Spain*, *Portugal*, and *Sicily*, generally in rocky places. This sends up many weak irregular shoots, which have no leaves, but instead thereof, are armed with short stiff thorns, which come out four or five together from the same point, and spread from each other every way. The flowers are small, of an herbaceous colour; the berries are larger than those of the common sort, and are black when ripe. This is tender, so must be treated as the third sort.

The seventh sort grows naturally at the *Cape of Good Hope*. This sends up from the root several slender stalks, which put out weak branches, which decline downward; these are closely garnished with bristly leaves, like those of garden *Asparagus*, which continue green through the year. It is propagated by parting of the roots, as the fifth sort, and the plants should be treated in the same manner.

The eighth sort grows naturally at the *Cape of Good Hope*; this sends up many weak shoots growing in clusters, which are armed with sharp spines, both on the side and end of the shoots; the leaves come out in small clusters, which continue green all the year. This is propagated as the fifth sort, and requires the same treatment.

The tenth sort sends out from the root many weak climbing branches which rise five or six feet high, which are garnished with narrow spear-shaped leaves coming out single; the shoots are armed with short crooked spines, which are so closely set on, that it is difficult to handle the branches. This is propagated by parting the root; but the plants must be placed in a moderate stove, otherwise it will not thrive in this country. It grows naturally in the island of *Ceylon*.

These plants are preserved in the gardens of the curious, where they add to the variety; being not difficult to manage, where there is conveniency to house them in winter. They should have a place among other exotic plants.

ASPARAGUS SCANDENS. See *Medeola*.

ASPEN TREE. See *Populus*.

ASPERUGO, Small Wild Bugloss.

The Characters are,

The flower is of one leaf, with a short cylindrical tube; it hath five short stamina in the center, with four compressed germen, which afterward become four oblong seeds, inclosed in the empalement.

We know but one Species of this genus, which is,

ASPERUGO. *Flor. Lapp.* 76. Small Wild Bugloss, Great Goose Grass, or German Madwort.

This is an annual plant, which is found wild in some parts of *England*, as near *Newmarket*, at *Boxley* in *Suffex*, and in *Holy Island*. It is preserved in the botanick gardens for variety: it may be easily propagated by seeds, which should be sown in autumn; and when the plants come up, they require no other culture but to keep them clear from weeds, and in *May* they will flower: in *June* their seeds will be perfected.

ASPERULA, Woodroof.

This plant grows wild in shady woods in many parts of *England*, and flowers in *April* or *May*, and is sometimes used in medicine; but as this grows wild in *England*, it is rarely admitted into gardens.

ASPHODELUS, King's Spear.

The Characters are,

The flower has no empalement; it is of one leaf, cut into six parts, which spread open; at the bottom is inserted a globular nectarium, having six valves; it hath six stamina, which are inserted in the valves of the nectarium. Between the nectarium is placed a globular germen, which afterward becomes a fleshy seed-vessel, having three cells, which are filled with triangular seeds.

The Species are,

1. ASPHODELUS caule folioso, foliis triquetris fistulosis. *Hort. Cliff.* 127. Common yellow King's Spear.

2. ASPHODELUS caule nudo ramoso foliis ensiformibus laciniatis. Male branching King's Spear with white flowers.

3. ASPHODELUS caule nudo simplici foliis lineari-ensiformibus. White unbranched King's Spear.

4. ASPHODELUS foliis ensiformibus carinatis scapo ramoso-patulo. King's Spear with sword-like, keel shaped leaves, and a branching spreading stalk.

5. ASPHODELUS caule nudo foliis subulatis fistulosis radice annua. Annual branching Spiderwort with a small flower and fistular leaves.

6. ASPHODELUS foliis planis, caule ramoso, floribus sparsis. King's Spear with plain leaves, a branching stalk, and flowers placed thinly.

The first sort is the yellow *Asphodel*, which is directed for use in medicine; this hath roots composed of many thick fleshy fibres, which are yellow, and are joined into a head at the top; from whence arise strong round single stalks, near three feet high, garnished on the upper part of the stalk with yellow star-shaped flowers, which appear in *June*, and the seeds ripen in autumn.

The second sort hath roots composed of many thick fleshy fibres; to each of which is fastened an oblong tuber, as large as small *Potatoes*; the leaves are long and flexible, having sharp edges; between these come out the stalks, which rise more than three feet high, sending out several side branches; the upper part of these are adorned with many white star-shaped flowers, which grow in long spikes, flowering gradually upward. They come out the beginning of *June*, and the seeds ripen in autumn.

The third sort hath roots like the second, but the leaves are longer and narrower; the stalks of this are single, never putting out any side branches; the flowers are of a purer white, and grow in longer spikes. This flowers at the same time with the former.

The fourth sort hath roots composed of smaller fibres than the two last, nor are the knobs at bottom half so large; the leaves are long, almost triangular, and hollow like the keel of a boat; the stalks seldom rise above two feet high, and divide into several spreading branches; these are terminated by loose spikes of white flowers, which are smaller than those of the former.

The fifth sort is an annual plant; the roots of this are composed of many fleshy fibres, which are yellow; the leaves are spread out from the crown of the root, close to the ground, in a large cluster; these are convex on their under side, but plain above; the flower-stalks rise immediately from the root, and grow about two feet high, dividing into three or four branches upward, which are adorned with white starry flowers, with purple lines on the outside. These flower in *July* and *August*, and their seeds ripen in *October*.

The yellow sort multiplies very fast by roots, and will soon overspread a large border, if suffered to remain unre-moved, or the side roots are not taken off: but the other sorts are not so productive of shoots from their sides, and are much better kept within bounds.

These sorts of *Asphodel* are very pretty ornaments for a flower garden, and require very little trouble to cultivate them, so are more acceptable. They may be all propagated by seeds, which should be sown soon after they are ripe, on a border of light fresh earth: in the spring the plants will appear, and will have strength enough to be transplanted by the *Michaelmas* following, when they should be planted in the flower nursery, at about six inches distance every way; observing to plant them so low, as that the top of the roots may be three or four inches under the surface of the bed; and some old tan, or dung, should be spread over the surface

of the ground, to keep out the frost: in this bed they may remain one year; then the roots having acquired strength enough to produce flowers the following year, they should, at *Michaelmas*, when their leaves are decayed, be carefully taken up, and transplanted into the flower garden, in the middle of the borders, amongst other hardy kind of flowers, where being properly intermixed, they will make an agreeable variety, and continue a long time in flower.

The fifth sort is annual, so is only propagated by seeds; these should be sown in the autumn, in the places where they are to remain for good. If the seeds of this plant are permitted to scatter, the plants will come up without care.

The sixth sort was raised from seeds in the *Chelsea* garden, *Anno 1751*, where it produced flowers the following year. The seeds came from the *Cape of Good Hope*, where this plant naturally grows.

The roots of this plant are composed of many tubers, or fangs, each about the size of a little finger, toward the upper part, where they are largest, and diminish gradually downward to the size of a small straw. These are joined together at the crown (like the roots of *Asparagus*), where the buds are formed; from whence the leaves are produced, which are generally seven or eight in number, and are nine or ten inches in length, and an inch and an half broad in the middle, lessening gradually to both ends. They are smooth, and of a glaucous or sea-green colour. From the center of the root arises the flower-stem, which grows about two feet and an half high, and divides into several branches. The flowers are produced thinly on the branches, forming a loose spike, or thyrsus. These are white, and consist of one leaf, which is deeply cut into six parts. The germen becomes a roundish seed-vessel, opening in three cells, which are filled with triangular seeds.

This plant is too tender to live through the winter in the open air in *England*, so must be kept in pots, and housed in winter, or placed under a hot-bed frame, where the frost is kept out by covering; in which management, the plants will thrive better than in a common green-house. In winter these plants must have little wet, for much moisture, at that season, is apt to rot their roots.

ASPLENIUM, or Ceterach.

This plant is nearly allied to the Fern, and grows upon old moist shady walls in divers parts of *England*; but is rarely cultivated in gardens.

ASTER, Starwort.

The Characters are,

It hath a compound flower, composed of several female and hermaphrodite florets, which are included in one common scaly empalement; the rays of the flower are composed of female florets; the hermaphrodite florets form the disk or middle; these are funnel-shaped, and have each five short slender stamina; in the bottom is placed a germen, which afterward becomes an oblong seed, crowned with down.

The Species are,

1. *ASTER foliis lanceolatis hirtis, radicalibus obtusis, caule simplicissimo unifloro. Lin. Sp. Pl. 872.* Blue Mountain Starwort with a large flower, and oblong leaves.

2. *ASTER foliis lanceolatis obtusis scabris trinervis integris, pedunculis nudiusculis corymbosis squamis calycinis obtusis. Lin. Sp. Plant. 873.* Common *Attick* Starwort, vulgarly called *Italian* Starwort.

3. *ASTER foliis lanceolatis integerrimis carnosus glabris ramis inæquatis, floribus corymbosis. Lin. Sp. Plant. 872.* Sea Starwort called *Tripolium*.

4. *ASTER foliis linearibus acutis integerrimis, caule corymboso ramosissimo. Hort. Cliff. 408.* Starwort with a flower of *Tripolium*, and a very narrow thin leaf.

5. *ASTER foliis lanceolatis alternis integerrimis semiamplexicaulibus floribus terminalibus. Hort. Cliff. 408.* Tallest

hairy *New England* Starwort with large purple Violet flowers.

6. *ASTER foliis cordato-lanceolatis undulatis floribus racemosis adscendentibus. Hort. Cliff. 408.* Purple *New England* Starwort with the appearance of golden rod, and waved leaves.

7. *ASTER foliis semiamplexicaulibus lanceolatis serratis scabris, pedunculis alternis subunifloris calycibus disco superantibus. Hort. Cliff. 408.* Broad-leaved *American* Starwort with purplish stalks.

8. *ASTER floribus ovatis disco radii longiore. Lin. Sp. Pl. 877.* Starwort like *Heath*, and the disk of the flower like *Wild Melilot*.

9. *ASTER foliis lanceolatis subserratis sessilibus caule paniculato ramulis unifloris solitariis calycibus squarrosis. Hort. Cliff. 408.* Broad-leaved umbellated Starwort of *New Holland*, with pale Violet flowers.

10. *ASTER foliis lanceolato-linearibus subcarnosis integerrimis planis floribus corymbosis fastigiatis pedunculis foliolosis. Lin. Sp. Plant. 874.* Starwort with the *Tripolium* flower.

11. *ASTER caule simplicissimo foliis ovatis sessilibus integerrimis racemo terminali. Flor. Virg. 178.* Starwort with single stalks, oval entire leaves growing close to the stalks, which end in a loose spike.

12. *ASTER caule paniculato pedunculis racemosis pedicellis foliosis foliolis linearibus integerrimis. Flor. Virg. 100.* Bushy *Heath* like Starwort.

13. *ASTER foliis cordatis serratis petiolatis, caule paniculato. Hort. Cliff. 408.* Broad-leaved autumnal Starwort.

14. *ASTER foliis lanceolato-linearibus medio serratis pedunculis foliosis caule racemoso calycibus erectis. Hort. Cliff. 408.* *American* Starwort with leaves like *Summer Cypress*, and bluish white flowers growing in very long spikes.

15. *ASTER caule corymboso foliis lanceolatis reflexis, floribus solitariis, calycibus patulis. Flor. Leyd. 168.* *Pyramidal Virginia* Starwort with rough *Hyssop* leaves, and leafy scales to the empalement.

16. *ASTER foliis lanceolatis scabris integris, caule ramoso, pedunculis foliosis, calycibus obtusis.* Another *Attick* Starwort of the *Alps*.

17. *ASTER foliis oblengo lanceolatis acutis serratis caule ramoso floribus terminalibus calycibus linearibus erectis.* Starwort with smooth jagged leaves, growing scatteringly like those of the *Peach tree*, and pale blue flowers.

18. *ASTER foliis oblongis acutis basi latioribus semiamplexicaulibus, caule ramoso floribus terminalibus plerumque solitariis.* Late blue shrubby Starwort of *John Tradescant*, commonly called *Michaelmas Daisy*.

19. *ASTER caule erecto hirsuto foliis oblongis acutis scabris acutè dentatis semiamplexicaulibus floribus corymbosis, calycibus hirsutis erectis.* Early *Pyrenean* Starwort with a large blue flower.

20. *ASTER caule altissimo hirsuto simplicissimo foliis oblongis acutis basi latioribus semiamplexicaulibus floribus tribus sessilibus terminalibus.* Starwort with a very tall unbranched stalk, oblong pointed leaves, which are broader at the base, and half embrace the stalks, which are terminated by three flowers sitting very close.

21. *ASTER caule ramosissimo patulo, foliis lineari-lanceolatis rigidis, floribus seriatim positus pedunculis foliosis.* Starwort with a very branching spreading stalk, narrow spear-shaped stiff leaves, flowers placed one above another, and leafy foot-stalks.

22. *ASTER foliis lanceolatis acutis scabris, caule simplici floribus umbellatis terminalibus.* Starwort with rough pointed spear-shaped leaves, and a single stalk, terminated by flowers, growing in an umbel.

23. *ASTER foliis nervosis acutis linearibus lanceolatis, caule simplici floribus terminalibus quasi umbellatim dispositis.* Starwort with narrow pointed nervous leaves, and a single stalk, terminated by flowers growing almost in an umbel.

24. *ASTER*

24. *ASTER foliis inferioribus ovatis basi semiamplexicaulibus, superioribus lanceolatis parvis caule paniculato, ramis unifloris pedunculis foliosis.* Starwort with the lower leaves oval, whose base half embraces the stalks, the upper leaves small and spear-shaped, a stalk terminated by a loose spike, with a single flower on each branch, and a leafy foot stalk.

25. *ASTER floribus terminalibus solitariis foliis linearibus alternis.* Flor. Virg. 98. Starwort with single flowers at the ends of the branches, and very narrow leaves placed alternately.

26. *ASTER foliis linearilanceolatis acutis sessilibus caule paniculato, ramis unifloris pedunculis foliosis linearibus.* Starwort with narrow, pointed spear-shaped leaves, growing close to the stalks, which end in loose spikes, and branches ending with a single flower, whose foot-stalks have narrow leaves.

27. *ASTER foliis linearilanceolatis glabris trinerviis floribus corymbosis terminalibus.* Starwort with smooth, narrow, spear-shaped leaves, with three veins, and flowers in a corymbus, which terminate the stalks.

28. *ASTER foliis linearibus integerrimis caule paniculato.* Hort. Cliff. 408. New England Starwort with Toad-flax leaves, and a Chamomile flower.

29. *ASTER foliis lanceolatis sessilibus integerrimis caule paniculato pedunculis foliosis.* Broad-leaved Starwort of New Holland, with deep Violet flowers growing in loose spikes.

30. *ASTER caule ramofo scabro perenni, foliis ovatis oppositis pedunculis nudis unifloris.* Fig. Pl. Tab. 76. Starwort with a rough perennial branching stalk, oval leaves growing opposite, and naked foot-stalks with one flower.

31. *ASTER foliis linearibus fasciculatis punctatis, pedunculis unifloris nudis, caule fruticoso rugoso.* Hort. Cliff. 409. Shrubby African Starwort, with narrow leaves growing in clusters.

32. *ASTER foliis ovatis angulatis dentatis, petiolatis calycibus terminalibus patentibus foliosis.* Hort. Cliff. 407. Annual Starwort with a goose-foot leaf, and a large beautiful flower, commonly called China Aster, or Queen Marguerette.

33. *ASTER foliis pinnatis.* Hort. Cliff. 407. Starwort with winged leaves.

The first sort grows naturally upon the Alps, where it seldom rises more than six inches high, and when transplanted into a garden, not above nine or ten. It sends up a single stalk from the root, at the top of which is one large blue flower, somewhat like those of the Italian Starwort. The root is perennial, but must be planted in a shady situation, and a moist soil.

The second sort is the Italian Starwort, which was some years past more common in the gardens than at present; for since the great variety of American Starworts have been introduced into England, this sort hath not been so much cultivated, though it is by no means inferior to the best of them; and, in some respects, preferable to most of them; for it is not so subject to creep by the root, as many of the American sorts do, whereby they often become troublesome in small gardens, nor do the stalks of these seldom grow more than two feet high, and are very strong, so are very rarely broken by the wind. They are terminated with large flowers having blue rays, with a yellow disk. It flowers in October, and, in mild seasons, will often continue till the middle of November; during which time they are very ornamental plants in a garden. This sort is propagated by parting of the roots; the best time for doing it is soon after they are out of flower, for those which are removed in the spring will not flower so strong the succeeding summer. These roots should not be removed oftener than every third year, where they are expected to produce many flowers.

It grows naturally in the vallies of Italy, Sicily, and Narbonne, and is generally supposed to be the Amellus mentioned by Virgil in his fourth Georgick, to grow in the pastures;

the leaves and stalks being rough and bitter, the cattle seldom browse upon it, so that whenever there are any of these roots in the fields, they send up a thick tuft of stalks, which, being left after the grass is eaten bare, these being full of flowers, make a fine appearance, and therefore might engage the poet's attention.

The third sort grows naturally in salt marshes, which are flowed by the tides, and is seldom admitted into gardens. It flowers in July and August.

The fourth sort is a native of North America. It sends up many strong shoots from the root every spring, which rise between four and five feet high, with oblong leaves, which half embrace the stalk with their base with a single flower; terminating the stalk, of a blue colour. This flowers in August and September; it is easily propagated by parting of the roots, soon after the flowers are past, and will thrive in almost any soil or situation.

The fifth sort sends up many stalks from the root, which rise five feet high, with spear-shaped leaves which are entire, and half embrace the stalks, which are terminated by large purple Violet flowers, growing in a loose panicle: it flowers in August, and is very hardy, so may be planted in any soil or situation, and is propagated by parting the roots.

The sixth sort grows naturally in North America. This hath broad heart-shaped waved leaves at the bottom; the stalks rise between two and three feet high, upon which the flowers come out in loose spikes, which are of a very pale blue colour, inclining to white. This flowers in the same season as the former, and may be propagated in the same manner.

The seventh sort sends up several strong stalks, upward of two feet high, which are of a purple colour, with spear-shaped smooth leaves, whose base embraces the stalks half round; the flowers grow upon single foot-stalks, forming a corymbus at the top, and are of a pale blue colour; these appear the latter end of September. This may be propagated in the same way as the former.

The eighth sort rises with slender stalks, upward of three feet high, garnished with very small leaves; the flowers come out on short foot-stalks, on every side of the branches, which are small, with white rays and a yellow disk. These appear in November, and often continue part of December. This may be propagated as is before directed.

The ninth sort rises near four feet high, having broad leaves at the bottom; the flowers are produced in a loose kind of umbel at the top of the stalks, which are of a pale blue colour, and appear the latter end of August. This is hardy, and may be propagated as the former.

The tenth sort grows three feet high; the stalks of this divide into a great number of branches, which divide again toward the top into several smaller, which are garnished with very narrow leaves; the flowers grow in large clusters at the top, forming a sort of corymbus; they are of a pale bluish colour, and appear the beginning of August. This is hardy, and may be propagated by parting of the roots, as the former.

The eleventh sort rises four feet high, with a single stalk, and oval leaves growing close to the stalks, which are terminated by slender loose spikes of pale blue flowers, which appear about Michaelmas. This is propagated as the sorts above-mentioned.

The twelfth sort sends up slender stalks three feet high; these are garnished with very narrow leaves their whole length, and are terminated by single flowers.

The thirteenth sort grows about two feet high, having slender stalks, with oblong pointed heart shaped leaves, which are sharply sawed on their edges, and are terminated by white flowers growing in loose panicles. This flowers in September, and may be propagated as the former.

The fourteenth sort sends up stalks five feet high, with narrow spear-shaped leaves, and are terminated by spikes of small white flowers, which appear the end of *October*. This sort spreads greatly at the root, so is apt to over-run the borders.

The fifteenth sort hath narrow oblong hairy leaves at the bottom; the stalks rise three feet high, with small narrow rough leaves which turn backward; the stalks are terminated by a single large blue flower. This sort flowers the end of *October*, and continues most part of *November*, when it makes a fine appearance. It doth not multiply fast by its roots, but may be propagated in plenty, by cuttings made from the young shoots in *May*, which, if planted in a bed of light earth, and shaded from the sun, will take root: it is called by the gardeners *Catesby's Starwort*.

The sixteenth sort sends up several stalks a foot and an half high, with rough spear-shaped leaves; these are terminated for the most part by one large blue flower, somewhat like those of the *Italian Starwort*, but paler and comes earlier to flower. It is propagated by parting of the root.

The seventeenth sort rises to the height of five feet, with branching stalks, and oblong spear-shaped leaves, which are sawed on their edges; the stalks are terminated by large pale blue flowers, and are in beauty in *October*. This is propagated by parting the roots, as the sorts before-mentioned.

The eighteenth sort was brought from *Virginia* many years ago, by Mr. *John Tradescant*, who was a great collector of rarities. It is generally known by the title of *Michaelmas Daisy*, from its flowering about old *Michaelmas* day. The stalks of this sort are numerous, and rise about four feet high, with oblong leaves ending in a point, whose base half embraces the stalks. The branches are terminated by pretty large flowers, which are of a very pale bluish colour, tending to white. The roots of this multiply very fast, so that it propagates so much as often to be troublesome; it will thrive in any situation.

The nineteenth sort sends up several strong hairy stalks, which rise a foot and an half high, having many oblong rough leaves ending in a point, whose base half embraces the stalks, which are terminated by one large blue flower, having a very hairy empalement. This flowers the latter end of *July*. This should have a moist soil and a shady situation. It is propagated by parting of the roots.

The twentieth sort rises with strong hairy stalks, to the height of eight or nine feet, which are upright, unbranched, and garnished with oblong hairy leaves ending in a point; their base half surrounds the stalks, which are for the most part terminated by three large purple flowers inclining to red, and sit close to the top of the stalk, surrounded by a few narrow leaves. This sort flowers in *November*. It is propagated by parting of the roots, and delights in a moist soil.

The twenty-first sort hath slender purplish stalks, which rise about three feet high, sending out many side branches, which spread horizontally, and are garnished with narrow small spear-shaped leaves; the flowers are produced in a sort of loose spike, growing one above another on each side the stalk. These are small, and of a pale purplish colour, and appear in *November*. It is easily propagated by parting of the roots.

The twenty-second sort sends up stiff channelled stalks about two feet high, which are garnished with rough spear-shaped leaves ending in a point; the flowers are white, and grow in a sort of umbel at the top of the stalks. It flowers the end of *September*, and is propagated by parting of the roots.

The twenty-third sort hath much the appearance of the former, but the leaves are narrower, whiter on their under side, and have three longitudinal veins; the flowers are also

larger and whiter. It grows about the same height, and flowers at the same time with the former.

The twenty-fourth sort rises four feet high; the bottom leaves are oval and half surround the stalk at their base, the upper leaves are small and spear-shaped; the stalks are terminated by one large blue flower, with a leafy foot-stalk; this flowers about the end of *October*, and is propagated by parting of the roots.

The twenty-fifth sort sends up from the root several slender stalks near three feet high, with very narrow leaves, and puts out side branches, each being terminated by one white flower. This flowers in *November*, and is easily propagated by parting of the roots.

The twenty-sixth sort rises about a foot and an half high, with very narrow spear-shaped leaves which are smooth; the stalks are terminated by one pale blue flower, having a leafy foot-stalk.

The twenty-seventh sort grows about two feet high, with erect stalks, with narrow smooth spear-shaped leaves, which come out irregularly in clusters; the upper part of the stalks are garnished with very narrow leaves; the flowers are produced in form of a corymbus at the end of the stalks, which are of a pale blue colour, and appear in *September*. This is propagated by parting of the roots.

The twenty-eighth sort rises with slender stalks about three feet high, with very narrow leaves, and are terminated by loose panicles of flowers, whose rays are white and their disks yellow. This flowers in *October*, and is propagated by parting of the roots.

The twenty-ninth sort sends out many strong stalks from the root, which rise about three feet high, with spear-shaped leaves growing close to the branches, which are terminated by loose spikes of dark blue flowers, which appear in *October*. This is propagated by parting of the roots.

The thirtieth sort grows naturally at the *Cape of Good Hope*. The plant has many fibrous roots, from which arise a purplish rough stalk, which divides into many branches near the root, so as to form a low bushy plant, with oval leaves about an inch long, and a third part of an inch broad; they are pretty thick and succulent, and are rough to the touch, having no foot-stalks: toward the upper part of the branches, the foot-stalks of the flower arise, which are from four to six inches long, and naked, each supporting a single radiated flower.

The rays of the flower are of a fine sky-blue colour, which, after they have been some time expanded, turn back toward the empalement; the disk of the flower is yellow. After the flower falls away, each of the florets which compose the disk is succeeded by a single seed, crowned with a soft down. The whole plant is a little acid to the taste.

This plant is never destitute of flowers the whole year, for in the winter season, there will always be a number of them in beauty, though at that time they are not so numerous, or quite so large as in summer; but the plants will not live in the open air in this country. It perfects its seeds very well, so may be propagated by sowing them in *April*, in a bed of light earth; and when the plants are large enough to transplant, they should be each put into a separate small pot, and may continue in the open-air till toward the end of *October*, at which time they should either be removed into the greenhouse, or put under a hot-bed frame to screen them from the frost in winter. It may also be propagated by cuttings, which should be planted in a shady border any time in summer, and when rooted must be treated as the seedlings.

The thirty-first sort rises with a woody stem about three feet high, sending out many side branches which are lignous, with narrow leaves coming out in clusters from one point, like those of the Larch tree; the flowers are produced from the side of the branches, upon long slender foot-stalks singly; these

these are of a pale blue colour, and appear the beginning of *March*; as this plant never produces seeds in *Europe*, so it is only propagated by cuttings, which may be performed any time in the summer. When the plants are rooted, they may be placed in the open air till the end of *October*, when they should be removed into shelter. This sort is at present but in few *English* gardens.

The thirty-second sort is a native of *China*, from whence the seeds were sent to *France* by the missionaries, where the plants were first raised in *Europe*. The seeds came by the title of *La Reine Marguerette*, or *Queen of Daisies*, by which title the *French* still call it. In 1752, I received seeds of the double flowers both red and blue, and in 1753, the seeds of the double white sort, which have retained their difference from that time without variation, yet as they are generally supposed to be only varieties, so I have not inserted them as different species.

As these are annual plants, so they are only propagated by seeds, which must be sown in the spring upon a gentle hot-bed, just to bring up the plants; for they should be inured to the open air as soon as possible, to prevent their being drawn up weak: when the plants are big enough to remove, they should be carefully taken up and planted in a bed of rich earth at six inches distance each way. In this bed they may remain a month or five weeks, by which time they will be strong enough to transplant into the borders of the flower garden, where they are designed to remain; the plants should be taken up carefully, with large balls of earth to their roots, and the ground dug up and well broken with the spade, where the holes are made to receive the plants: this work should, if possible, be done when there is rain, for then the plants will soon take new root, after which time they will require no other care.

In *August* these plants will flower, by which time if the ground is rich in which they are planted, they will be two feet high, and furnished with many side branches, each of which is terminated by a large radiated flower, some white, some red, and others blue. The seeds ripen the beginning of *October*, which should be gathered when it is perfectly dry; and in order to preserve the kinds with double flowers, those which grow upon the side branches, which are commonly fuller of leaves than the flowers on the main stem, should always be preserved for seeds.

The thirty-third sort is an annual plant, which rises with an upright stalk about one foot high, with winged leaves, each consisting of two or three pair of lobes terminated by an odd one: at the top of the stalk is produced one large Orange-coloured flower, having a single empalement, cut into many slender segments which end in points: after the flower is past, each floret is succeeded by an oblong angular seed, crowned with long down. This plant is propagated by seeds, which should be sown on a moderate hot-bed in the spring; and when the plants are fit to remove, they must be each planted into a separate small pot filled with rich earth, and plunged into the tan bed, where they may remain to flower and perfect their seeds, for they will not thrive in the open air. This sort flowers in *July*, and the seeds ripen in *September*.

ASTERISCUS. See *Bupthalmum*.

ASTEROIDES, Bastard Starwort. See *Inula*.

ASTRAGALOIDES. See *Phaca*.

ASTRAGALUS, Wild Liquorice, Liquorice Vetch, or Milk Vetch.

The Characters are,

It hath a butterfly flower. The standard (or vexillum) is upright, blunt, and reflexed on the sides; the wings are oblong, and shorter than the standard; the keel is the same length with the wings, and bordered. At the bottom of the flower is situated a taper germen, which afterward becomes a pod having two cells, each having a row of kidney-shaped seeds.

The Species are,

1. ASTRAGALUS caulescens prostratus leguminibus subtriquetris arcuatis foliis ovalibus pedunculo longioribus. *Lin. Sp. Pl.* 758. Common wild perennial trailing Milk Vetch with yellow flowers, sometimes called Wild Liquorice.

2. ASTRAGALUS caulescens procumbens, leguminibus subulatis recurvatis glabris. *Hort. Upsal.* 226. Yellow annual Milk Vetch of *Montpelier*, with trailing stalks.

3. ASTRAGALUS caulescens, spicis cylindricis subsessilibus, calycibus leguminibusque lanatis. *Lin. Sp. Pl.* 755. Taller Foxtail Milk Vetch of the *Alps*.

4. ASTRAGALUS caulescens prostratus, leguminibus subglobosis inflatis mucronatis pilosis. *Hort. Upsal.* 226. Yellow perennial Milk Vetch, with a round double pod resembling a bladder.

5. ASTRAGALUS caulescens procumbens, leguminibus capitatis cordatis acutis reflexis complicatis. *Lin. Sp. Plant.* 759. Larger *Spanish* Milk Vetch, with pods like the epiglottis, and a purple flower.

6. ASTRAGALUS subcaulos scapis folio longioribus, floribus laxè spicatis erectis. *Prod. Leyd.* 392. Milk Vetch, or Cock's-head with large Vetch flowers of a purplish blue colour, and Goat's-thorn leaves.

7. ASTRAGALUS caulescens procumbens, spicis pedunculatis leguminibus prismaticis erectis triquetris apice uncinatis. *Hort. Upsal.* 225. Trailing maritime annual Milk Vetch, with broad leaves and flowers sitting upon foot-stalks.

8. ASTRAGALUS subcaulescens procumbens floribus subracemosis erectis foliis tomentosis. *Lin. Sp. Plant.* 759. Small hoary purple Milk Vetch.

9. ASTRAGALUS acaulos scapis folia æquantibus leguminibus inflatis subglobosis nudis. *Lin. Sp. Plant.* 760. Low Milk Vetch with swelling globular pods.

10. ASTRAGALUS caulescens erectus floribus glomeratis subsessilibus ex omnibus axillis foliaceis. *Lin. Sp. Pl.* 755. Greatest hoary upright eastern Milk Vetch, with flowers coming out from the bottom to the top of the stalk.

11. ASTRAGALUS caulescens scapis folio longioribus floribus laxè spicatis erectis, leguminibus arcuatis. *Egyptian* Milk Vetch, with spikes of purple flowers and incurved pods.

12. ASTRAGALUS caulescens diffusus capitulis subsessilibus lateralibus leguminibus erectis subulatis acumine reflexis. *Hort. Cliff.* 361. Annual Milk Vetch with hairy leaves and pods, many of them growing close to the wings of the leaves.

13. ASTRAGALUS caule recto paniculato pedunculis folio longioribus floribus sparsis. *Hort. Cliff.* 362. Tallest eastern Milk Vetch with a Goat's-rue leaf, and a small yellowish flower.

14. ASTRAGALUS acaulos scapo erecto foliis longiore leguminibus subulatis inflatis villosis erectis. *Hort. Upsal.* 226. Hairy white unbranched Milk Vetch, with purple Violet flowers growing in spikes.

15. ASTRAGALUS caulescens erectus lævis pedunculis spicatis leguminibus ovato-cylindricis stylo acuminatis. *Lin. Sp. Pl.* 757. Taller untrailing Milk Vetch, with a yellowish green flower.

16. ASTRAGALUS caulescens diffusus leguminibus subcylindricis mucronatis foliolis subtus subvillosis. *Lin. Sp. Pl.* 757. *Canada* Milk Vetch with a yellowish green flower.

17. ASTRAGALUS caulescens erectus pilosus floribus spicatis leguminibus subulatis pilosis. *Lin. Sp. Pl.* 756. Upright hairy Milk Vetch, with yellow flowers growing in spikes.

18. ASTRAGALUS incanus caulibus procumbentibus scapis folio æquantibus floribus glomeratis. *Supine* Milk Vetch with hairy glomerated pods.

19. ASTRAGALUS caulescens incanus, leguminibus subulatis recurvatis incanis. Hoary Milk Vetch with a crooked pod.

20. ASTRAGALUS caulescens capitulis globosis, pedunculis longissimis, foliolis emarginatis. *Hort. Cliff.* 360. A most hairy eastern Milk Vetch, with rounder heads and purple flowers.

The first fort grows wild upon chalky ground in many parts of *England*, so is not often admitted into gardens. The root of this is perennial, but the stalks decay every autumn: it creeps at the root, so that it is too apt to spread where it is suffered to grow. It flowers in *June*, and the seeds ripen in *September*.

The second fort is annual; the branches of this trail upon the ground, which are striated; the leaves are composed of about eight pair of lobes, terminated by an odd one: the foot-stalk of the flowers arise from the wings of the leaves, which is about three inches long, garnished toward the top with a few pale yellow flowers rising one above another; these are succeeded by oblong pods, which bend in form of a fickle. It flowers in *June*, and the seeds ripen in *September*. The seeds of this should be sown in *April*, in the place where they are to remain.

The third fort is a biennial plant. This rises with an upright hairy stalk near three feet high, with long winged leaves, each having eighteen or twenty pair of oval lobes, terminated by an odd one. The flowers are produced in large cylindrical spikes from the wings of the leaves, sitting very close to the stalks, which are entirely covered with down, out of which the yellow flowers just peep; these are succeeded by oval pods shut up in the woolly empalements. It flowers in *June* and *July*, and the seeds ripen in the autumn, soon after which the plants decay. The seeds of this should be sown on an open border, where the plants are designed to remain in *April*.

The fourth fort hath a perennial root, which sends out several striated stalks near three feet long, which, if not supported, prostrate themselves toward the earth, with winged leaves placed alternately, which are composed of about ten pair of oval small lobes, terminated by an odd one. The flowers arise from the wings of the leaves, upon foot-stalks two inches long, in small loose spikes, which are yellow, and shaped like the rest of this genus, and are succeeded by hairy globular swelling pods ending with a sharp point. It flowers in *July*, and the seeds ripen in the autumn. It is easily propagated by seeds, which should be sown upon an open border in the spring, in the place where they are to remain. One or two of these plants in a garden by way of variety, may be admitted, but they have little beauty.

The fifth fort is annual. This sends out from the root two or three hairy trailing branches, which are garnished with leaves, composed of ten or twelve pair of blunt lobes, terminated by an odd one: the flowers come out from the wings of the leaves upon naked foot-stalks, four or five inches long, and are gathered into a round head; these are shaped like the others, but are pretty large, and of a deep purple colour, which are succeeded by short pods rough on their outsides, and when opened are shaped like a heart, ending in a sharp point, containing three or four seeds.

The seeds of this should be sown on an open border in *April*, where the plants are to remain, and treated as the other annual forts before-mentioned.

The sixth fort is a perennial plant, seldom rising with a stem more than three inches high, with leaves, which are composed of many pairs of narrow lobes, set very close together on the midrib, terminated by an odd one. The flowers grow upon long foot-stalks, which rise above the leaves; these are large and of a purple colour, growing in a loose spike, and stand erect, and are succeeded by oblong crooked pods opening in two cells, filled with square seeds. This is propagated by seeds, which should be sown, and the plants treated in the same manner as the fourth fort, but should have a shady situation and a stronger soil.

The seventh fort is annual; it hath trailing branches near two feet long, with winged leaves, composed of about ten pair of blunt lobes, set thinly on the midrib, terminated by

an odd one: at the wing of the leaf comes out a foot-stalk near two inches long, sustaining four or five yellow flowers at the top, which are succeeded by triangular brown pods, shaped like a prism, growing erect, and opens in two cells filled with greenish square seeds. This may be treated in the same manner as the second.

The eighth fort is a perennial plant, which grows in several parts of *England*, particularly in the north. It is a low plant, seldom rising more than two or three inches high, with leaves composed of narrow woolly lobes, placed close on the midrib; the flowers are pretty large, of a purple colour, growing in loose spikes. It flowers in *June*, and the seeds ripen in *August*. This should have a shady situation.

The ninth fort hath a perennial creeping root, with leaves composed of many pair of oval lobes, terminated by an odd one; the flower-stalks are as long as the leaves, which support a cylindrical spike of yellow flowers, which are succeeded by swollen pods, opening into two cells, containing several greenish seeds. This may be propagated as the fourth fort, and must have a shady situation.

The tenth fort sends up stalks near three feet high, which are large at bottom, and gradually diminish to the top; the leaves at bottom are very long, and diminish upward, so as to form a sort of pyramid; these are composed of many large oval pair of lobes, which are placed thinly on the midrib, and are terminated by an odd one; the flowers come out in clusters from the wings of each leaf. These are large, of a bright yellow colour, and are succeeded by cylindrical pods opening in two cells, filled with square yellow seeds. It flowers in *July*, and in very favourable seasons will perfect seeds in *England*. It is propagated by seeds, which should be sown, and the plants afterward treated, as hath been directed for the fourth fort. The third year from seed the plants will flower, and continue many years in a proper soil.

The eleventh fort is an annual plant, which rises with upright stalks a foot and an half high, which are thinly garnished with leaves, composed of about twelve pair of oval lobes, terminated by an odd one; the foot-stalks of the flowers arise from the wings of the leaves, and are extended beyond them; these are terminated by loose spikes of yellow flowers, which are succeeded by fickle-shaped pods. It flowers in *July*, and the seeds ripen in autumn. It may be propagated by seeds, in the same manner as hath been before directed for the annual forts.

The twelfth fort is an annual plant, which sends out several weak stalks without any order, having leaves, composed of ten or twelve pair of lobes, and sometimes terminated by an odd one; at the foot-stalks of the leaves the flowers come out in small clusters, sitting close to the sides of the stalks, which are of a copper colour, and are succeeded by awl-shaped pointed pods growing erect, reflected at their points. This is propagated by seeds, in the same manner as the other annual forts before-mentioned.

The thirteenth fort hath a perennial root, which sends out many upright stalks upward of five feet high, which are garnished with leaves, composed of about fourteen pair of oval lobes, terminated by an odd one; from the wings of the leaves the foot-stalks of the flowers arise, which are garnished with small yellow flowers, growing in loose spikes, and are extended beyond the leaves; these are succeeded by very short triangular pods, ending in a point, which open in two cells, filled with Ash-coloured square seeds. It is propagated by seeds, which, if suffered to fall on the ground, the plants will come up and require no farther culture. The roots of this fort will abide many years.

The fourteenth fort never rises with a stalk, but sends out leaves from the root, which are composed of many blunt lobes, placed by pairs, and terminated by an odd one; the

foot-stalks of the flowers arise immediately from the root, and are longer than the leaves, being terminated by spikes of blue flowers, which are succeeded by swelling awl-shaped pods, that are erect and hairy, having two cells which are filled with greenish seeds. It flowers in *July*, and the seeds ripen in autumn. The root is abiding, and the plant is propagated by seeds as the fourth sort, but should have an open situation.

The fifteenth sort hath a perennial root, but an annual stalk; from the root arise several upright stalks three feet high, which are garnished with leaves, composed of eighteen or twenty pair of oval smooth lobes, and terminated by an odd one; from the wings of the leaves arise the foot-stalks, which are terminated by spikes of greenish yellow flowers, which are succeeded by oval cylindrical pods, to which adhere the style, which extend beyond the pods in a point. This flowers in *August*, but unless the season is warm, the plants seldom ripen their seeds in *England*. It is propagated by seeds, which should be sown upon a moderate hot-bed in the spring; and when the plants come up they must be inured to the open air, into which they should be removed the end of *May*, and planted in a warm border, where they will thrive and flower; and if the winter proves very severe, a little old tan should be laid over the roots, which will effectually preserve them.

The sixteenth sort hath a perennial root, which sends out many irregular stalks about two feet long, with leaves, composed of many pair of oval lobes, which are hairy on their under side; from the wings of the leaves come out the foot-stalks, supporting spikes of greenish yellow flowers; which are succeeded by cylindrical pods, ending in a point.

The seventeenth sort rises with upright stalks two feet high, which are hairy, and garnished with leaves, composed of many pair of oval woolly lobes, terminated by an odd one; from the wings of the leaves arise the foot-stalks, which are terminated by close spikes of yellow flowers, which are succeeded by hairy awl-shaped pods, having two cells, filled with brown seeds. It is a perennial plant, and propagated by seeds, in the same manner as the fourth sort.

The eighteenth sort is a biennial plant, with many trailing stalks, which are divided into many smaller branches, with leaves composed of many pair of narrow lobes, terminated by an odd one; the flowers are collected into heads, which terminate the foot-stalks, and are white; the foot-stalks are about the same length as the leaves; the pods are short and triangular, and the whole plant is covered with a silvery down. The seeds of this should be sown upon an open bed of light earth, where the plants are to remain, and the plants afterward treated in the manner before directed for the annual sorts.

The nineteenth sort sends up an upright stalk, seldom more than six inches high, with small winged hoary leaves; the foot-stalks arise from the wings of the leaves, supporting three or four pale flowers, which are succeeded by fickle-shaped hoary pods. This is a biennial plant, and should be treated in the same manner as the last.

The twentieth sort sends up several erect stalks, garnished with leaves, composed of several pair of lobes, which are indented at the top: from the wings of the leaves come out long foot-stalks, supporting a globular head of purple flowers; these are rarely succeeded by pods in *England*. It flowers the end of *July*.

ASTRANTIA, Masterwort.

The Characters are,

It is a plant whose flowers grow in an umbel; the involucre of the general umbel is composed of two large trifid leaves, and two entire, and in another species of several small leaves: the flower is composed of five petals, which are bifid: it hath five stamens. The oblong germen is situated below the receptacle, which after-

ward becomes an oval blunt channelled fruit, divided into two parts, having two oblong oval seeds inclosed in the cover.

The Species are,

1. ASTRANTIA foliis radicalibus quinquelobatis serratis, caulibus trilobatis acutis. Greatest Masterwort with a purplish involucre.

2. ASTRANTIA foliis quinquelobatis lobis tripartitis. Haller: Helv. 439. Greater Masterwort with a white involucre.

3. ASTRANTIA foliis digittatis serratis. Lin. Sp. Pl. 255. Smaller black Hellebore with a Sanicle leaf.

The first sort hath many spreading leaves rising from the root, composed of five large lobes, sawed pretty deep on their edges; from between these the stalks arise near two feet high, having at each joint one leaf deeply cut into three sharp pointed lobes; at the top of the stalk is produced the umbel of flowers, at the bottom of which is situated the general involucre, composed of two long trifid leaves, and two entire ones of the same length, which extend beyond the rays, and are of a purplish colour.

The second sort hath much the appearance of the first, but it differs from that in having five lobes to the leaves of the stalks, which are much shorter, and rounder at the point, than those of the other. The general involucre of the umbel is composed of short narrow leaves, and those of the smaller umbels are shorter and white.

The third sort seldom rises a foot high; the foot-stalks of the leaves are four inches long; the leaves are divided into eight segments to the bottom, and spread out like a hand; the involucre of the general umbel is composed of several very narrow leaves; the foot stalks of the separate umbels are very long and slender, and toward the top often divide into three, each having a small umbel. The involucre of these small umbels are short and white.

These plants are very hardy; they may be propagated either by sowing of their seeds, or parting their roots. The seeds should be sown in the autumn, soon after they are ripe, on a shady border; when the plants come up, where they are too close, some of the plants should be drawn out, to allow room for others to grow until *Michaelmas*, when they should be transplanted where they are to remain; which should always be in a moist soil, and a shady situation. The distance these plants should be placed, is three feet, for their roots will spread to a considerable width, if they are permitted to remain long in the same place. These plants are seldom preserved but in botanick gardens, there being no great beauty in their flowers.

ATHAMANTA. Lin. Gen. Plant. 301. Spignel.

The Characters are,

It is a plant with an umbellated flower; the involucre of the great umbel is composed of many narrow leaves, which are shorter than the rays; those of the small ones are narrow, and equal with the rays: each flower hath five slender stamens, of the same length with the petals; the germen is situated below the receptacle, which afterward becomes an oblong channelled fruit, divided into two parts, each containing one oval channelled seed.

The Species are,

1. ATHAMANTA foliolis capillaribus, seminibus glabris striatis. Hort. Cliff. 93. Spignel with Dill leaves.

2. ATHAMANTA foliolis linearibus planis hirsutis, petalis bipartitis, seminibus oblongis hirsutis. Lin. Mat. Med. 143. Candy Carrot with very slender Fennel leaves.

3. ATHAMANTA foliis inferioribus nitidis, umbellis primordialis subsessilibus, seminibus pilosis. Hort. Upsal. 60. The second Sicilian Carrot with a Flixweed leaf.

The first sort is the common Spignel used in medicine. It grows naturally in *Westmoreland*, and by the inhabitants there is called Bald-Money, or Bawd-Money; by some it is called Meu. This is a perennial plant, the stalks rise a foot and an half high, and are channelled; the leaves are very ramose,

and composed of many fine hair-like leaves, set pretty close, and are of a deep green; the stalk is terminated by an umbel of white flowers, which are succeeded by oblong smooth seeds.

This may be propagated by parting of the roots at *Michaelmas*, or from seeds sown soon after they are ripe; the plants should have a shady situation and a moist soil.

The second sort is the *Daucus Creticus*, of which there are two sorts, whose seeds are indifferently used in the shops, one of which is annual; but that here mentioned is a perennial plant, whose leaves are composed of numbers of slender narrow leaves like those of Fennel, irregularly disposed. The flower-stalk rises about two feet high, sending out many branches, with the same compound capillary leaves, and at the top are terminated by compound umbels, composed of near twenty small ones; these have white flowers with five petals, which are succeeded by oblong, hairy, channelled fruit, divided into two parts, containing one oblong hairy seed.

This sort is propagated by seeds, which should be sown in autumn on an open bed of light dry ground; the following autumn the plants should be carefully taken up, and planted at about a foot distance in a bed of light sandy earth, where the roots will continue several years, and annually flower, and produce ripe seeds. It flowers in *June*, and the seeds are ripe in *September*.

The third sort is a perennial plant, which sends up from the root several upright stalks, near three feet high, which are terminated by compound umbels. The flowers are composed of five white petals, which are not quite equal, and are succeeded by oblong woolly fruit, divided into two parts, each containing one oblong channelled seed.

This may be propagated in the same manner as the former, and is equally hardy.

ATRACTYLIS. *Lin. Gen. Pl.* 837. Distaff Thistle.

The Characters are,

It hath a radiated, compound flower, composed of many hermaphrodite florets, which are included in a common scaly empalement, which hath no spines. The hermaphrodite florets compose the rays, or border, and are stretched out on one side like a tongue. Those which compose the disk are funnel-shaped; in those of the disk is situated a short crowned germen, which afterward becomes a turbinated compressed seed, crowned with a plume of down, stout up in the empalement.

The Species are,

1. *ATRACTYLIS involucris cancellatis ventricosus, linearibus dentatis calycibus ovatis, floribus fuscis.* *Lin. Sp. Plant.* 830. Small Cnicus with a netted head, and woolly seed.

2. *ATRACTYLIS foliis dentato-sinuatis, flore radiato ovalato involucri patente, caule herbaceo.* *Lin. Sp. Plant.* 829. Lower purple prickly Cnicus.

3. *ATRACTYLIS flore acaule.* *Lin. Sp. Plant.* 829. Prickly gum-bearing Cnicus without stalk, and a Carline Thistle leaf.

4. *ATRACTYLIS foliis oblongo ovatis denticulatis spinosis calycibus patentibus caule fruticoso.* *Hort. Cliff.* 295. Shrubby African Bastard Saffron with an Ilex leaf, and a golden flower.

The first sort is an annual plant, which seldom rises more than eight or nine inches high, with a slender stem, garnished with narrow hoary leaves, having spines on their edges; at the top of the stalk there are two or three slender branches sent out, each being terminated by a head of flowers, like those of the Thistle, with an involucre composed of several narrow leaves, armed with spines on their side, and are longer than the head of the flowers. The empalement is curiously netted over, and is narrow at the top, but swelling below, containing many florets of a purplish colour. These are each succeeded by a single downy seed, which in cold years never perfect here.

It is propagated by seeds, which must be sown upon an open bed of light earth, where the plants are to remain, and thin the plants where they come up too close together.

The second sort rises with a stalk near a foot high, with indented leaves, having small spines on their edges; the upper part of the stalk is divided into two or three slender branches, each supporting a head of purple flowers, having rays inclosed in a scaly empalement. The roots of this will live two or three years; it flowers in *June*, but unless the summer is warm and dry, it will not perfect seeds in *England*. The seeds of this sort should be sown where they are to remain, and will require no other culture than the former.

The third sort is what the *College of Physicians* have placed among the medicinal simples, by the title of Carline Thistle; the root of this is perennial, and sends out many narrow leaves, which are deeply sinuated, and armed with spines on their edges. These lie close on the ground, and between them the flower is situated, without stalk, having many florets, inclosed in a prickly empalement. Those on the border are white, but those which compose the disk of a yellowish colour. It flowers in *July*, but never perfects seeds in *England*.

The fourth sort rises with a shrubby stalk, near three feet high, with oblong leaves, indented on their edges, which have weak spines at each indenture; there are several weak branches sent out on the sides, each of which are terminated by a single head of flowers, inclosed in a common empalement which spreads open, and are of a golden colour, but are never succeeded by seeds in *England*. This is propagated by slips, or heads, taken from the flower-stalks in *June*; when these have taken root, they may be exposed in the open air till *October*, when they must be removed into shelter, and, during the winter, should have little water, but in summer should be exposed with other hardy exotick plants in a sheltered situation.

ATRAPHAXIS. *Lin. Gen. Plant.* 405. We have no *English* name for this.

The Characters are,

The flower hath a permanent empalement. It hath two roundish sinuated petals larger than the empalement, which are permanent; it hath six capillary stamina; in the center is situated a compressed germen, which afterward becomes a roundish compressed seed, stout up in the empalement.

The Species are,

1. *ATRAPHAXIS ramis spinosis.* *Hort. Cliff.* 138. Shrubby prickly *Atraphaxis* of the east, with a fair flower.

2. *ATRAPHAXIS inermis.* *Lin. Sp. Plant.* 333. African creeping shrubby *Atraphaxis*, with leaves curled on their sides.

The first is a shrub which rises four or five feet high, sending out many weak lateral branches, which are armed with spines, with small spear-shaped leaves of an Ash colour, which are smooth. The flowers come out at the ends of the shoots in clusters, composed of two white leaves tinged with purple, and are included in a two-leaved empalement of a white herbaceous colour; these appear in *August*. The plant is propagated by cuttings, and must be screened from hard frost, which commonly destroys those which are planted in the open air.

The second sort sends out many slender branches, which trail on the ground when they are not supported, with small oval leaves, about the size of those of the Knot-grass, but are waved and curled on their edges, embracing the stalk half round at their base. The flowers come out from the wings of the leaves, and have much the appearance of an apetalous flower, being composed of four herbaceous leaves, two of which are the empalement, the other two the petals. It flowers in *June* and *July*. This is a native of the country about the *Cape of Good Hope*. It may be easily propagated by cuttings any time in the summer, and in winter the plants must be screened from frost.

ATRIPLEX, Orach, or Arach.

The Characters are,

It hath female and hermaphrodite flowers on the same plant. The hermaphrodite flowers have a permanent empalement of five leaves, with membranaceous borders. In the center is placed the orbicular germen, which afterward becomes an orbicular compressed seed, shut up in the five-cornered empalement.

The Species are,

1. *ATRIPLEX caule erecto herbaceo foliis triangularibus.* Hort. Cliff. 469. Pale, green, or white Garden Orach.
2. *ATRIPLEX caule fruticoso foliis deltoidibus integris.* Hort. Cliff. 469. Broad-leaved Orach, or shrubby Halimus, commonly called Sea Purslane Tree.
3. *ATRIPLEX caule fruticoso foliis obovatis.* Flor. Suec. 829. Shrubby Sea Orach, or Halimus, called Sea Purslane, with a narrow leaf.

There are several other species of this genus, some of which grow naturally in *England*, but as they are plants of no beauty, so they are rarely admitted into gardens, for which reason I shall not enumerate them here.

The first of these plants was formerly cultivated in the kitchen gardens, as a culinary herb, being used as Spinage, and is now, by some persons, preferred to it; though, in general, it is not esteemed amongst the *English*; but the *French*, at present, cultivate this plant for use.

There are three or four different varieties of this, whose difference is only in the colour of the plants; one of which is of a deep green, another of a dark purple, and a third with green leaves and purple borders. These are generally supposed to be only accidental varieties which have come from the same seeds, but in thirty years which I have cultivated these sorts, I have never yet observed them to vary.

These plants are annual, so must be sown for use at *Michaelmas*, soon after the seeds are ripe; at which time it generally succeeds better than when it is sown in the spring, and will be fit for use at least a month earlier. They require no other culture, but to hoe them when they are about an inch high; to cut them down where they are too thick, leaving them about four inches asunder, and to cut down all the weeds. When your plants are grown about four inches high, it will be proper to hoe them a second time, in order to clear them from weeds; and, if you observe the plants are left too close in any part, you must then cut them out. Where these plants are sown on a rich soil, and allowed a good distance, the leaves will be very large, in which the goodness of the herb consists. This must be eaten while it is young; for, when the stalks become tough, it is good for nothing. The first sort is ordered by the *College of Physicians* for medicinal use.

The second sort was formerly cultivated in gardens as a shrub; and, by some persons, were formed into hedges, and constantly sheared, to keep them thick; but this plant is by no means fit for such purposes, on many accounts, for it grows too vigorous; the shoots, in one month, at the growing season of the year, will be two feet long, provided they have a good soil; so that a hedge of this plant cannot be kept in tolerable order, nor will it ever form a thick hedge. But a worse inconvenience attends this plant; for, in very hard winters, it is often destroyed.

It may be propagated by cuttings, which may be planted in any of the summer months, on a shady border, they will soon take root, and be fit to transplant the *Michaelmas* following, when they should be planted where they are to remain.

The third sort grows wild in divers parts of *England*, on the sea side, from whence the plants may be procured; or it may be propagated by cuttings, in the same manner as the former sort. This is a low under shrub, seldom rising above two feet and an half, or at most three feet high, but becomes very bushy. This may have a place amongst other low shrubs; and, if planted on a poor gravelly soil, will abide several years, and make a pretty diversity.

ATROPA. Lin. Gen. Plant. 222. Deadly Nightshade:

The Characters are,

The flower is bell-shaped, and divided into five equal parts. It hath five stamina rising from the base of the petal. In the center is situated an oval germen, which afterward becomes a globular berry having three cells, sitting on the empalement, and filled with kidney-shaped seeds.

The Species are,

1. *ATROPA caule herbaceo, foliis ovatis integris.* Lin. Sp. Plant. 181. Common Deadly Nightshade.
2. *ATROPA caule fruticoso.* Lin. Sp. Plant. 182. Deadly Nightshade with a shrubby stalk.

The first sort grows wild in many parts of *England*, but is not very frequent near *London*. This plant hath a perennial root, which sends out strong herbaceous stalks of a purplish colour, which rise to the height of four or five feet, with oblong entire leaves, which toward autumn change to a purplish colour; the flowers come out between the leaves singly, upon long foot-stalks; these are large, bell-shaped, and of a dusky brown colour on their outside, but are purple within. After the flower is past, the germen turns to a large round berry, a little flatted at the top, and is first green, but when ripe turns to a shining black, sitting close upon the empalement, and contains a purple juice of a nauseous sweet taste, and full of small kidney-shaped seeds. In some places this plant is called *Dwale*, but in general *Deadly Nightshade*, from its quality. It should not be suffered to grow in any places where children resort, for it is a strong poison; there has been several instances within a few years past, of its deadly quality, by several children being killed with eating the berries.

There is also an instance of the direful effects of this plant recorded in *Buchanan's History of Scotland*, wherein he gives an account of the destruction of the army of *Sveno*, when he invaded *Scotland*, by mixing a quantity of the juice of these berries with the drink which the *Scots* by their truce were to supply them with; which so intoxicated the *Danes*, that the *Scots* fell upon them in their sleep, and killed the greatest part of them, so that there were scarcely men enough left to carry off their king.

The second rises with a shrubby stem to the height of six or eight feet, divided into many branches, garnished with round leaves, in shape like those of the *Storax* tree. The flowers come out between the leaves upon short foot-stalks, which are shaped like those of the former, but are much less, of a dirty yellowish colour, with a few brown stripes; these are never succeeded by berries in *England*. It grows naturally in *Spain*, and is only propagated by seeds. The plants are too tender to live abroad in winter, therefore at the end of *October* they must be removed into the greenhouse, and treated as other plants from the same country. It flowers in *July* and *August*.

AVENA. Lin. Gen. Plant. 85. Oats.

The Characters are,

The flowers are collected in a loose panicle, and have a bivalvular empalement, swelling in the middle. The petal of the flower is bivalve, having a spiral beard, twisting, jointed, and reflexed. There are two oval nectariums sitting upon the upper side of the germen; they have three slender stamina: the germen afterward becomes an oblong swelling seed, having a longitudinal furrow, and closely shut up in the cover or chaff.

AVENA calycibus dispermibus seminibus levibus. Hort. Cliff. 25. Oats with two smooth seeds in each empalement.

There are three varieties of these oats cultivated in *England*, viz. the white, the black, and the brown or red Oat, but where they have been many years separately cultivated, I have never observed them to alter. However, as their principal difference is in the colour of the grain, I shall not enumerate them as distinct species. There is also a naked Oat, which

which is sometimes cultivated in the distant parts of *England*, but is rarely seen near *London*.

The white sort is the most common about *London*; the black is more cultivated in the northern parts of *England*, and is esteemed a very hearty food for horses; but the first makes the whitest meal, and is chiefly cultivated where the inhabitants live much upon oat cakes.

Oats are a very profitable grain, and absolutely necessary, being the principal grain which horses love; and are esteemed the most wholesome food for those cattle, being sweet, and of an opening nature; other grains being apt to bind, which is injurious to labouring horses: but if you feed them with this grain soon after they are housed, before they have sweat in the mow, or are otherwise dried, it is as bad on the other hand, for they are then too laxative.

This grain is a great improvement to many estates in the north of *England*, *Scotland*, and *Wales*; for it will thrive on cold barren soils, which will produce no other sort of grain; it will also thrive on the hottest land: in short, there is no soil too rich or too poor for it, too hot or too cold for it; and in wet harvests, when other grain is spoiled, this will receive little or no damage; the straw and husks being of so dry a nature, that if they are housed wet, they will not heat in the mow, or become mouldy, as other grain usually do; so is of great advantage in the northern parts of *England*, and in *Scotland*, where their harvest is generally late, and the autumns wet.

The best time for sowing of Oats is in *February* or *March*, according as the season is early or late; and sometimes I have known it sown in *April* upon cold land, and has been early ripe. The black and red Oats may be sown a month earlier than the white, because they are hardier.

Oats are often sown on land which has the former year produced Wheat, Rye, or Barley. The common method is to plough in the stubble about the beginning of *February*, and sow the Oats, and harrow them in; but then they must be harrowed the same way as the furrows lay, for if it be done crossways, the stubble will be raised on the surface; but this is not a good method of husbandry, for when people have time to plough the stubble in autumn, it will rot in winter; and then giving the land another ploughing and a good harrowing just before the oats are sown, it will make the ground finer and better to receive the grain. Most people allow four bushels of Oats to an acre, but I am convinced two bushels are more than enough; the usual produce is about twenty-five bushels to an acre, though I have sometimes known more than thirty-five bushels on an acre.

Oats are also sown upon land when it is first broken up, before the ground is brought to a tilth for other grain, and is frequently sown upon the sward with one ploughing; but it is much better to give the sward time to rot before the Oats are sown, for the roots of the grass will prevent those of the corn from striking downward.

AURANTIUM, the Orange Tree.

The Characters are,

The flower hath five oblong spreading petals, and many stamens, which are frequently joined in small separate bodies at bottom. In the center is situated the germen, which after-ward becomes a globular fleshy fruit, compressed at both ends, having a thick fleshy pulp, and divided into several cells, each containing two oval callous seeds.

The Species are,

1. AURANTIUM foliis ovato-lanceolatis glabris. The common *Seville* Orange.

2. AURANTIUM foliis lanceolatis acutis glabris. The *China* Orange.

3. AURANTIUM foliis lineari lanceolatis glabris. Orange Tree, with narrow leaves called Willow-leaved Orange, and by some the *Turkey* Orange.

4. AURANTIUM foliis ovato-lanceolatis crassis lucidis, fructu maximo. The Pampelmoes, or Shaddock.

5. AURANTIUM pumilum foliis ovatis floribus sessilibus. The Dwarf or Nutmeg Orange.

There are many varieties of this, as there is of most other fruits which have arisen from culture; but those here enumerated may strictly be allowed to be distinct species. The varieties in the *English* gardens are, 1. The yellow and white striped leaved Orange. 2. The curled leaved Orange. 3. The horned Orange. 4. The double flowering Orange. And, 5. The hermaphrodite Orange.

The *China* Orange is not so hardy as the *Seville*, therefore must be treated more tenderly to have good fruit in *England*.

The dwarf Orange is also tender, and the leaves are very small, growing in clusters. This sort, when in flower, is proper to place in a room or gallery, to adorn them; the flowers being very sweet, but these are seldom to be found in good health, because they must be treated with more care than the common Orange and Lemon trees; as must also the Shaddock, otherwise the fruit will always drop off in winter. The Pampelmoes were brought from the *East* to the *West-Indies*. But the inhabitants have greatly degenerated the fruit since it has been in the *West-Indies*, by raising the trees from seeds; the greatest part of which produce harsh sour fruit, greatly inferior to the original sort; the flesh or pulp of which is red, whereas the greater part of the trees in *America* produce fruit with a pale yellow flesh; and by constantly raising these trees from seeds, they degenerate the fruit continually; whereas if they would bud from the good sort, they might have it in as great plenty as they pleased.

All the sorts of Orange and Lemon trees with striped leaves are tender, therefore must be placed in a warm part of the green-house in winter, and must be treated with more care than the common sort, otherwise they will not thrive.

The horned Orange differs from the other sorts, in the fruit dividing into parts, and the rind expanding in form of horns: this and the distorted Orange, are preserved by some curious persons for variety. There is also a great variety of sweet Oranges both in the *East* and *West-Indies*; some of which are much more esteemed than those we now have in *Europe*.

If you purpose to raise stocks for budding of Oranges, you should procure some Citron seeds which were duly ripened; for the stocks of this kind are preferable to any other, both for quickness of growth, as also that they will take buds of either Orange, Lemon, or Citron; next to these are the *Seville* Orange seeds. The best seeds are usually to be had from rotten fruits, which are commonly easy to be procured in the spring of the year; then prepare a good hot-bed, of either horse dung or tanners bark; the last of which is much the better, if you can easily procure it. When this bed is in a moderate temper for heat, you must sow your seeds in pots of good rich earth, and plunge them into the hot-bed. In three weeks or a month the plants will come up, and if they are not stunted, either for want of proper heat or moisture, they will be in six weeks after their appearance, fit to transplant into single pots: you must therefore renew your hot-bed, and having prepared a quantity of small halfpenny pots, fill these half full of fresh loamy earth, mixed with very rotten cow dung; and then shake out the young plants from the seed pots, with all the earth about them, that you may the better separate the plants without tearing their roots; put a single plant into each of the pots; then fill them up with the same earth as before directed, plunging the pots into the new hot-bed, giving them a good watering to fix the earth to their roots, and screen them from the sun in the heat of the day. In this method, with due care, your plants will grow to be two feet high by the end of *July*, when you must begin to harden them by degrees, in raising your glasses very

very high, and when the weather is good, take them quite off; but do not expose them to the open sun in the heat of the day, but rather take off the glasses, and shade the plants with mats, which may be taken off when the sun declines; for the violent heat in the middle of the day would be very injurious to them in hot weather, especially while young. Toward the end of *September* you must house them, observing to place them near the windows of the green-house, to prevent the damps from moulding their tender shoots. During the winter season they may be often refreshed with water. If the plants are plunged into a gentle hot-bed in the spring, it will greatly forward them; but they should be hardened by the beginning of *June*, that they may be in right order to bud in *August*; when you should make choice of cuttings from trees that are healthy and fruitful, of whatever kinds you please, observing that the shoots are round; the buds of these being much better and easier to part from the wood, than such as are flat. When you have budded the stocks, you should remove them into a green-house, to defend them from wet, turning the buds from the sun; but let them have as much free air as possible, and refresh them often with water. In a month's time after budding, you will see which of them has taken; you must then untie them, that the binding may not pinch the buds, and let them remain in the green-house all the winter; then in the spring, prepare a moderate hot-bed of tanners bark; and, after having cut off the stocks about three inches above the buds, plunge their pots into the hot-bed, observing to give them air and water, as the heat of the weather shall require; but be sure to screen them from the violence of the sun during the heat of the day. With this management, if your buds shoot kindly, they will grow to the height of two feet or more, by *July*; at which time you must begin to harden them before the cold weather comes on, that they may the better stand in the green-house the following winter. In the first winter after their shooting, you must keep them warm; for, by forcing them in the bark bed, they will be somewhat tenderer; however, it is very necessary to raise them to their height in one season, that their stems may be strait: for such trees, which are two or more years growing to their heading height, their stems are generally crooked. In the succeeding years, their management will be the same as in full grown trees, which will be hereafter treated of: I shall, therefore, now proceed to treat of the management of such trees as are brought over every year in chests from *Italy*; which is, indeed, by much the quicker way of furnishing a green-house with large trees; for those which are raised from seeds in *England*, will not grow so large in their stems under eighteen or twenty years, as these will have when brought over; and although their heads are small when we receive them, yet in three years, with good management, they will have large heads, and produce fruit.

In the choice of these trees, observe first, the difference of their shoots and leaves (if they have any upon them) to distinguish their different sorts, for the Shaddock and Citrons always make much stronger shoots than the Orange; for which reason, the *Italian* gardeners, who raise these trees for sale, generally propagate those sorts, so that they bring few of the *Seville* Orange trees over, which are much more valuable, both for their flowers and fruit; also prefer those that have two good buds, one on each side of the stock (for many of them have but one, so will always have an irregular head): the straitness of the stem, freshness of the branches, and plumpness of the bark, are necessary observations.

When you have furnished yourself with a parcel of these trees, you must prepare a moderate hot-bed of tanners bark in a forcing frame, in length and breadth according to the number of trees to be forced; then put your trees into a

tub of water upright, about half way of the stems, leaving the head and upper part of the stem out of the water, the better to draw and imbibe the moisture. In this situation they may remain two or three days (according to their plumpness when you received them); then take them out, and clean their roots from all filth, cutting off all broken or bruised roots, and all the small fibres, which are quite dried by being so long out of the earth; and scrub the stems with a hard hair brush, cleaning them afterwards with a cloth; then cut off the branches about three inches from the stem, and having prepared a quantity of good fresh earth, mixed with very rotten neats dung, plant your trees therein, observing never to put them into large pots; for if they are big enough to contain their roots, it is sufficient at first planting; and be sure to put some potsherds and large stones in the bottom of each pot, to keep the holes at the bottom of the pots from being stopped with earth, that the water may freely pass off, and wrap some haybands round their stems, from bottom to top, to prevent the sun from drying their bark; then plunge these pots into the bark bed, watering them well to settle the earth to their roots, frequently repeating the same all over their heads and stems, being very careful not to over water them, especially before they have made good roots; and observe to screen the glasses of your hot-bed from the sun in the heat of the day.

If your trees take to grow kindly (as there is little reason to doubt of, if the directions given be duly observed), they will have made strong shoots by the beginning of *June*; at which time you should stop their shoots, to obtain lateral branches to furnish their heads; and now you must give them air plentifully, and begin to harden them, that in the middle of *July* they may be removed into the open air, in some warm situation, defended from the great heat of the sun, and from winds, that they may be hardened before winter. About the end of *September* you should house these plants, sitting them at first in the front of the green-house, near the glasses, keeping the windows open at all times when the weather will permit; and about the latter end of *October*, when you bring in the Myrtles, and other less tender trees, you must set your Oranges in the warmest and best part of the house, placing lower plants or trees in the front, to hide their stems. During the winter, let your waterings be frequent, but give them not too much at a time; for now their heads are but small, and therefore incapable to discharge too great a quantity of moisture; and take great care to guard them from frost.

In the spring, when you begin to take out some of your hardiest sorts of plants, to thin your house, wash and cleanse the stems and leaves of your Orange trees, taking out the upper part of the earth in the pots, filling them up again with good fresh rich earth, laying thereon a little rotten neats dung round the outside of the pots, but do not let it lie near the stem of the trees; then place them at wider distances in the house, that the air may circulate round their heads; giving them air discretionally, as the weather grows warm, but do not remove them into the open air until the middle or latter end of *May*, that the weather is settled; for many times, when they are removed out too soon, the mornings often proving cold, give them at least a great check, which will change the colour of their leaves, and many times kill the extreme weak part of the shoots. Let the situation for your Orange trees, during the summer season, be as much defended from the sun in the heat of the day, and strong winds, as possible, by tall trees or hedges; both of which, if they are exposed thereto, are very hurtful to them.

As these trees advance, it will be necessary in the summer to stop strong shoots when they grow irregular, to force out lateral branches to fill the head; but do not pinch off the tops of all the shoots (as is the practice of some), which

will fill the tree with small shoots, too weak to support fruit; but endeavour to form a regular head, and obtain strong shoots, taking away weak trifling branches where they are too close.

During the summer season, your Orange trees will require frequent waterings in dry weather, especially if they are large; therefore you should endeavour to have the water as near the trees as possible, to save the trouble of carrying it, which in a large quantity of trees, takes up much time. Your water should be soft, and exposed to the air, but never add dung of any sort thereto; which, although by many frequently recommended, yet has always been found destructive to these trees, if much used; it being like hot liquors to human bodies, which, at first taking, seem to add vigour, yet certainly leave the body weaker after some time, than before.

Your Orange trees will require to be shifted and new potted every other year, therefore you must prepare a quantity of good earth, at least a year before you intend to use it, that it may be well mixed and perfectly rotten. The best season for this work is about the end of *April*, that they may have taken fresh root before they are removed out of the green-house; and when this work is performed, it will be necessary to let them remain in the house a fortnight longer than usual, to be well settled.

When you first set these trees abroad after shifting, you should place them near the shelter of hedges, and fasten their stems to strong stakes, to prevent their being disturbed by winds; which sometimes will blow fresh planted trees out of the pots, if too much exposed thereto, and thereby greatly injure their new roots.

If old Orange trees have been ill managed, and their heads become ragged and decayed, the best method to restore them, is to cut off the greatest part of their heads early in *March*, and prune their roots; then soak and clean their stems and branches, planting them into good earth, and setting them into a hot-bed of tanners bark, as was directed for such trees as came from abroad, managing them in the same manner: by this method they will produce new heads, and in two years time, become good trees again. But if these are large trees, and have grown in tubs for several years, your best way will be to prepare a parcel of rough baskets (such as are used for basketting Ever-greens, when sent to a distant place): let these be somewhat less than the tubs you design to plant your trees into; then plant your trees herein, plunging them into the hot-bed, and about the beginning of *July*, when your trees have made good shoots, you may remove them into the tubs, with their baskets about them, filling the empty space with the same good earth: this will preserve your tubs from rotting in the bark, and the trees will do equally well as if planted into the tubs at first, provided you are careful in removing the baskets, not to disturb their roots; and also let them remain in the green-house a fortnight or three weeks after planting, before you set them abroad.

In the management of Orange trees which are in good health, the chief care should be to supply them with water duly, and not (as is sometimes practised) starve them in winter, whereby their fibres are dried, and become mouldy, to the great prejudice of the trees; nor to give them water in too great abundance; but rather let their waterings be frequent, and given in moderate quantities. You must also observe, that the water has free passage to drain off, for if it be detained in the tubs or pots, it will rot the tender fibres of the trees; nor should they be placed too near each other in the green-house, but set them at such a distance, that their branches may be clear of each other, and that the air may circulate freely round their heads. In summer they should be placed where the winds are not violent, and to have the morning and evening sun; for if they are too much exposed

to the mid-day sun, they will not thrive. The best situation for them is near some large plantation of trees, which will break the force of the winds, and screen them from the violent heat of the sun. In such a situation they may remain until the beginning of *October*, or later, according as the season proves favourable; for if they are carried into the green-house early, and the autumn should prove warm, it will occasion the trees to make fresh shoots, which will be weak and tender, and so liable to perish in winter; nor should they remain so long abroad as to be injured by morning frosts.

The best compost for Orange trees is two-thirds of fresh earth from a good pasture, which should not be too light, nor over stiff, but rather a Hazel loam; this should be taken about ten inches deep with the sward, which should be mixed with the earth to rot, and one third part of neats dung; these should be mixed together, at least twelve months before it is used, observing to turn it over every month, to mix it well, and to rot the sward; this will also break the clods, and cause the mould to be finer.

Of late years there have been many of these trees planted against walls, and frames of glass made to fix over them in winter; and some few curious persons have planted these trees in the full ground, and have erected moveable covers to put over them in winter, which are so contrived as to be all taken away in summer: where these have been well executed, the trees have made great progress in their growth, and produced a much larger quantity of fruit, which have ripened so well, as to be extremely good for eating. If these are planted either against walls with design of training the branches to the walls, or in borders at a small distance, so as to train them up as standards, there should be a contrivance of a fire-place or two, in proportion to the length of the wall, and flues carried the whole length of the wall, to warm the air in very cold weather, otherwise it will be very difficult to preserve the trees in very hard winters alive. The manner of making these flues is fully explained under the article of *HOT WALLS*. Where this contrivance is made, there will be no hazard of losing the trees, be the winter ever so severe, with a little proper care; whereas, if this is wanting, there will require great care and trouble to cover and uncover the glasses every day, when there is any sun; and if the wall is not thicker than they are usually built, the frost will penetrate through the walls in severe winters; so that covering and securing the glasses of the front will not be sufficient to preserve the trees, be it done with ever so much care: therefore the first expence of the walls will save great trouble and charge, and be the securest method.

If the ground is wet, or of a strong clay, so as to detain the moisture, the borders should be raised above the level of the ground, in proportion to the situation of the place; for where the wet lies in winter near the surface, it will greatly prejudice, if not totally destroy the trees; so that lime rubbish should be laid at least two feet thick, in the bottom of the border, to drain off the wet; and the earth should be laid two and an half or three feet thick thereon, which will be a sufficient depth for the roots of the trees. In these borders there may be a few roots of the *Guernsey* and *Belladonna* Lilies planted, or any other exotick bulbous-rooted flowers, which do not grow high, or draw too much nourishment from the borders; and these, producing their flowers in autumn or winter, will make a good appearance, and thrive much better than if kept in pots.

AURICULA MURIS, Mouse Ear.

This is a sort of Hawkweed with small hairy leaves, which are white underneath: the plant trails upon the ground, taking root at the joints, by which means it will soon spread over a large compass of ground.

This is very common in *England*; it grows chiefly on dry barren places, or upon old walls, and is too often a troublesome weed in grass plats in gardens.

AURICULA URSI, Bear's Ear, or Auricula.

To enumerate the varieties of this plant, would be almost endless and impossible; for every year produces vast quantities of new flowers, differing in shape, size, or colour of the flowers; and also in the leaves of these plants there is as great a variety, so that the skilful florist is often capable of distinguishing the particular sorts thereby.

But as it seldom happens, that such of these flowers as are at one time in great esteem, continue to be regarded a few years after, (there being still finer or larger flowers produced from seeds, which are what the florists chiefly seek after), it would be needless to mention any of them; wherefore I shall proceed to give the characters of a good Auricula.

1. *The stem of the flower should be lofty and strong.*
2. *The foot-stalk of the single flower should be short, that the umbel may be regular and close.*
3. *The pipe or neck of each flower should be short, and the flowers large, and regularly spread, being no ways inclinable to cup.*
4. *That the colours are very bright, and well mixed.*
5. *That the eye of the flower be large, round, and of a good white, or yellow; and that the tube or neck be not too wide.*

All the flowers of this kind, that want any of the above mentioned properties, are now rejected by every good florist; for as the varieties every year increase from seeds, so the bad ones are turned out to make room for their betters; but in some people the passion for new flowers so much prevails, that, supposing the old flower greatly preferable to a new one, if it is of their own raising, the latter must take place of the old one.

In order to obtain good flowers from seeds, you must make choice of the best flowers you have; which should be exposed to the open air, that they may have the benefit of showers, without which they seldom produce good seeds: the time of their ripening is in *June* and *July*, which you will easily know, by their seed-vessel turning to a brown colour, and opening; you must therefore be careful lest the seeds be scattered out of the vessel, for it will not be all fit to gather at the same time.

The time for sowing this seed is commonly in *August*; but if it be sown before *Christmas*, it will be time enough.

The best soil for this seed is good fresh light sandy mould, mixed with very rotten neats dung, or very rotten dung from the bottom of an old hot-bed: with this you should fill your pots, or boxes, in which you intend to sow your seeds; and having levelled the surface of the earth very smooth, sow your seeds thereon, covering it very lightly with rotten Willow mould taken out of the stems of decayed hollow Willow trees; then cover the box, &c. with a net or wire, to prevent the cats, fowls, &c. from scratching out, or burying your seeds too deep; for whenever this happens, the seeds will remain a year in the ground before the plants appear, if it should grow at last; therefore many persons never cover these seeds, but sow them upon the surface of the earth, in the boxes uncovered with earth, for the rain to wash them into the ground, which is often the best method: let these boxes, &c. be placed so as to receive only the morning sun, during the winter season; but in the beginning of *March*, remove them where they may have scarce any sun, for your young plants will now soon begin to appear, which, if exposed to one whole day's sun only, will be all destroyed.

During the summer season, in dry weather, often refresh them with water, but never give them too great quantities at once. In the *July* following, your plants will be large enough to transplant, at which time you must prepare a bed, or boxes, filled with the above mentioned soil, in which you

may plant them about three inches square, and (if in beds) you must shade them every day, till they are thoroughly rooted, as also in very hot dry weather; but if they are in baskets, or boxes, they may be removed to a shady place.

When the seedling Auriculas are planted in beds, there should be some rotten neats dung laid about ten inches under the surface, and beaten down close and smooth: this will prevent the worms from drawing the young plants out of the earth, which they generally do where this is not practised. This dung should be laid about a foot thick, which will entirely prevent the worms getting through it until the plants are well established in the beds; and the roots of the Auriculas will strike down into the dung by the spring, which will make their flowers stronger than usual: these beds should be exposed to the east, and screened from the south sun.

When you have taken all your plants which are come up, out of the boxes or pots, level the earth gently again; for it often happens, that some of the seeds will lie in the ground two years before they appear, especially if they were covered too deep when sown, as was before observed.

The spring following many of these flowers will shew; when you may select such of them as have good properties, which should be removed each of them into a pot of the same prepared earth, and preserved until the next season, at which time you will be capable to form a judgment of the goodness of the flower; but those that produce plain coloured or small flowers, should be taken out, and planted in borders in the out-parts of the garden, to make a shew, or gather for nosegays, &c. the others, which do not produce their flowers the same year, may be taken up, and transplanted into a fresh bed, to remain till you see how they will prove.

The manner of propagating these flowers when obtained, is from offsets, or slips, taken from the old roots in *April*, when the flowers are in bloom: these offsets must be planted into small pots filled with the same sort of earth, as was before directed for the seedlings; and, during the summer season, should be set in a shady place, and must be often (but very gently) refreshed with water: but in the autumn and winter, should be sheltered from violent rains. The spring following, these young plants will produce flowers, though but weak; soon after they are past flowering, you must put them into larger pots, and the second year they will blow in perfection.

But, in order to obtain a fine bloom of these flowers, you must observe the following directions.

First, Preserve your plants from too much wet in winter, which often rots and spoils them, but let them have as much free open air as possible; nor should they be too much exposed to the sun, which is apt to forward the budding for flower too soon; and the frosty mornings, which often happen in *March*, thereby destroy their buds, if they are not protected therefrom. To prevent which, those who are very curious in these flowers, place their pots in the autumn, under a common hot-bed frame; where, in good weather, the plants may enjoy the full air, by drawing off the glasses; and in great rains, snow, or frost, the plants may be screened, by covering them. When this method is practised with judgment, the flowers will be much stronger, and the plants will increase faster, than when they are exposed abroad.

Secondly, In the beginning of *February*, if the weather is mild, you must take off the upper part of the earth in the Auricula pots, as low as you can without disturbing their roots, and fill up the pots with fresh rich earth, which will greatly strengthen them for bloom; as also prepare your offsets for transplanting in *April*, by causing them to push out new roots.

Those plants which have strong single heads always produce the largest cluster of flowers; therefore the curious florists pull off the offsets as soon as it can be done with safety to their growing, to encourage the mother plants to flower the stronger; they also pinch off the flowers in the autumn, where they are produced, and suffer them not to open, that the plants should not be weakened thereby.

Thirdly, You must cover your pots with mats in frosty weather, during this time of their budding for flower, lest the sharp mornings blight them, and prevent their blowing.

Fourthly, When your flower-stems begin to advance, and the blossom buds grow turgid, you must protect them from hasty rains, which would wash off their white mealy farina, and greatly deface the beauty of their flowers; but at the same time observe to keep them as much uncovered as possible, otherwise their stems will be drawn up too weak to support their flowers (which is often the case when their pots are placed under walls), and give them gentle waterings to strengthen them; but let none of the water fall into the center of the plant, or among the leaves.

Fifthly, When your flowers begin to open, you should remove their pots upon a stage (built with rows of shelves, one above another, and covered on the top, to preserve them from wet: this should be open to the morning sun, but sheltered from the heat of the sun in the middle of the day): in this position they will appear to much greater advantage, than when the pots stand upon the ground; for, their flowers being low, their beauty is hid from us; whereas, when they are advanced upon shelves, we see them in full view: in this situation they may remain until the beauty of their flowers is past; when they must be set abroad to receive the rains, and have open free air, in order to obtain seeds, which will fail, if they are kept too long under shelter. When your seed is ripe, observe to gather it when it is perfectly dry, and expose it to the sun in a window upon papers, to prevent its growing mouldy, and let it remain in the pods till the season for sowing it.

AURICULA URSI MYCONI. See Verbascum.

AZALEA. *Lin. Gen. Plant.* 195. American upright Honey-suckle.

The Characters are,

It hath a coloured empalement which is permanent, cut into five acute parts at the top. The flower is funnel-shaped, having a long naked tube, cut into five parts; the two upper segments are reflexed backward, the two sides are bent inward, and the lower one turns downward. It hath five slender stamina of unequal lengths, with

a round germen, which afterward becomes a roundish capsule, having five cells, filled with roundish small seeds.

The Species are,

1. AZALEA foliis margine scabris, corollis piloso-glutinosis. *Lin. Sp. Plant.* 151. This is the American upright Honey-suckle with a white flower.

2. AZALEA foliis ovatis corollis pilosis staminibus longissimis. *Lin. Sp. Pl.* 150. Commonly called red American upright Honey-suckle.

The first of these is a low shrub, rising with several stems two or three feet high. The leaves come out in clusters at the end of the shoots without order, and their edges are set with very short teeth, which are rough. The flowers come out in clusters between the leaves, at the extremity of the branches, which are white, with a mixture of dirty yellow on their outside. They have a tube an inch long, and at the top are pretty deeply cut into five segments; the two upper are reflexed, the two side ones are bent inward, and the lower is turned downward, with five stamina a little longer than the petals; the style is much longer than the stamina. These flowers have much the appearance of those of the Honey-suckle, and are as agreeably scented.

The second sort grows taller than the first, and in its native country, frequently rises the height of twelve feet, but in *England* is never more than half that height. This hath several stems with oblong smooth leaves. The flower-stalks arise from the division of the branches, which are long and naked, supporting a cluster of red flowers; they are divided at the top into five equal segments, which spread open. The five stamina, and the style, are much longer than the petals, and stand erect.

These plants grow naturally in shade, and upon moist ground, in most parts of *North America*, so they must have a moist soil, and a shady situation, otherwise they will not thrive. They can only be propagated by shoots from their roots, for they do not produce seeds here; and if good seeds are obtained, they are difficult to raise, and will be a long time before they would flower. But when they are in a proper situation, their roots extend, and put out shoots, which may be taken off with roots, and transplanted. The autumn is the best time to remove the plants, but the ground about their roots should be covered in winter to keep out the frost; and if this is every year practised to the old plants, it will preserve them in vigour, and cause them to flower well.

AZEDARACH. See Melia.

AZEROLE, or L'AZAROLE. See Mespilus.

B.

BACCHARIS, Ploughman's Spikenard.

The Characters are,

The flower is composed of many hermaphrodite and female florets, which are included in one common, cylindrical, scaly empalement. The hermaphrodite florets are funnel-shaped; and have five slender stamina with an oval germen, which afterward becomes a single short seed crowned with a long down. The female flowers have no stamina, but in other respects are the same.

The Species are,

1. BACCHARIS foliis lanceolatis longitudinaliter dentato-serratis. *Hort. Cliff.* African tree Groundsel with a sawed leaf.

2. BACCHARIS foliis obversè ovatis, superne emarginato-crenatis. *Lin. Hort. Cliff.* Virginia Groundsel tree, with an Orach leaf.

The first sort was brought from the *Cape of Good Hope*, but grows naturally in *Peru*, and in other parts of *America*. There

is little beauty in the flower; it grows to the height of five or six feet, and is a manageable shrub; it may be propagated by cuttings, which should be planted in a shady border during any of the summer months, or by seeds sown in a common border in the spring of the year, which ripen well in this country; and, if permitted to scatter on the ground, the plants will come up the following spring. It is pretty hardy, and will live abroad in mild winters, if planted in a warm situation; but it is usually kept in green-houses, and placed abroad in summer; it requires much water in warm weather.

The second sort is a native of *Virginia* and other parts of *North America*; it grows about seven or eight feet high, with a crooked shrubby stem, and flowers in *October*; the flowers are white, and not very beautiful; but the leaves continuing green through the year, has occasioned this shrub to be admitted into many curious gardens.

This sort may be propagated by cuttings, which should be planted in *April* or *May*, upon a shady border, and, at *Michaelmas*, they will be fit to transplant where they are to remain; this will live in the open air, and never is injured by the cold of our ordinary winters; but severe frost will sometimes destroy them.

BALAUSTIA. See *Punica*.

BALLOTE, Black Horehound.

This is a common weed, growing on the sides of banks in most parts of *England*, so is seldom allowed a place in gardens; there are two varieties of it, one with a white, and the other a purple flower.

BALM. See *Melissa*.

BALSAMINA, the female Balsamine or Balsamine. See *Impatiens*.

BALSAMITA. See *Tanacetum*.

BAMIA MOSCHATA. See *Hibiscus*.

BANANA. See *Musa*.

BANISTERIA. *Houft. Mss. Lin. Gen. 509.*

The Characters are,

The flower hath five petals, which are shaped like those of the papilionaceous tribe, but spread open, having in some species one, in others two, and in some, several nectarious glands, with ten short stamina. There are in some species three, and in others but one germen, which afterward become so many winged fruit, like those of the *Maple*, each containing a single seed.

The Species are,

1. BANISTERIA foliis ovato-oblongis rigidis racemis terminalibus caule fruticoso scandente. Banisteria with oblong oval stiff leaves, spikes of flowers terminating the branches, and a shrubby climbing stalk.

2. BANISTERIA foliis ovatis glabris, floribus corymbosis terminalibus, caule fruticoso scandente. Banisteria with oval smooth leaves, flowers growing in a corymbus at the extremity of the branches, and a shrubby climbing stalk.

3. BANISTERIA foliis ovatis acuminatis floribus laxè spicatis, ramis diffusis scandentibus. Banisteria with oval pointed leaves, flowers growing in loose spikes, and climbing diffused branches.

4. BANISTERIA foliis cordatis nervosis subtus incanis, floribus lateralibus, caule fruticoso scandente. Banisteria with nervous heart-shaped leaves, hoary on their under side, flowers growing from the side of the branches, and a shrubby climbing stalk.

5. BANISTERIA foliis ovato-oblongis acuminatis racemis lateralibus seminibus patentibus. *Flor. Zeyl. 176.* Banisteria with oblong oval pointed leaves, spikes of flowers growing from the side of the branches, and spreading seeds.

6. BANISTERIA foliis pinnatis foliolis ovatis spicis lateralibus seminibus erectis. Banisteria with winged leaves, whose small leaves are oval, spikes of flowers growing from the side of the branches, and erect seeds.

The first grows naturally in *Jamaica*. This hath a woody stalk, which twists itself round the neighbouring trees, and raises itself to their top. It is garnished with leaves as large as those of the *Bay tree*, and of the same thickness, growing opposite; the flowers are produced in long branching spikes at the end of the branches, which are yellow, and are succeeded by two or three winged seeds like those of the greater *Maple*.

The second sort grows naturally in *Jamaica*, at *Campeachy*, and several other parts of *America*. This hath slender winding stalks, which rise five or six feet high, with oval smooth leaves; the flowers grow in a round bunch at the extremity of the branches, which are of a brownish yellow colour, and are succeeded by winged seeds like the former, but smaller, and have narrower wings.

The third sort came from *Carthagera*, where it naturally grows. This sends out many branches, which divide again into others, growing without order, and become very bushy upward, sending out tendrils by which they fasten themselves to the neighbouring trees, and mount to a great height; these have oval stiff leaves, ending in a point. The flowers are produced in loose spikes at the ends of the branches, which are first of a gold colour, and fade to a scarlet, and are succeeded by seeds of the same shape with the former, but are slender, thin, and for the most part single.

The fourth sort was sent me from *Campeachy*; this hath many irregular climbing stalks, which fasten themselves to the neighbouring trees, and rise to a great height, with heart-shaped leaves, which are hairy on their under side, where they have many transverse ribs. The flowers come out thinly from the side of the branches, which are of a pale yellow colour, and are succeeded by large winged seeds, which are double.

The fifth sort hath strong woody stalks, which twine about the trees that grow near it, and rises twenty feet high, garnished with oblong pointed leaves, like those of the *Bay tree*, growing by pairs opposite; from the wings of the leaves, the flowers are produced in loose spikes, upon long foot stalks, which are blue, and are succeeded by slender winged seeds, which spread open from each other.

The sixth sort hath strong ligneous stalks, covered with an Ash-coloured bark, and divide into many branches, garnished with winged leaves, composed of five or six pair of oval small leaves, whitish on their under side; from the wings of the leaves are produced slender bunches of flowers, growing in a racemus like those of the *Currant bush*, and are of a purplish colour; these are succeeded by broad winged seeds, growing erect.

These plants are all of them natives of warm countries, so cannot be preserved in *England*, unless they are kept in a bark stove. They are propagated by seeds, which must be procured from the countries where they grow naturally. These seeds should be fully ripe when gathered, and put into sand, in which they should be sent to *England*, otherwise they will lose their vegetative quality; for these seeds are not only in shape like those of the *Maple*, but also are of the same quality, requiring to be sown as soon as possible, when they are ripe, or preserved in sand till they are sown, otherwise they rarely succeed. The seeds should be sown in pots, and plunged into a hot-bed of tanners bark, where the heat is very moderate, and if the plants should not appear the first year, the pots should be preserved till the next spring, to see if the seeds will grow. When the plants come up, they must be planted in separate pots, filled with light earth, and plunged into the bark bed, after which they must be treated like other tender plants from the same countries.

BAOBOB. See *Adanfonia*.

BARBA CAPRÆ. See *Spiræa*.

BARBA JOVIS. See Anthyllis.

BARBAREA. See Erysimum.

BARDANA. See Arctium.

BARLERIA. The inhabitants of the island of Jamaica call it Snap-dragon.

The Characters are,

The flower is nearly of the lip kind, of one leaf, funnel-shaped, and divided into five parts at the top. It hath four slender stamens, two short, and two longer. In the center is placed the oval germen, which after-ward becomes an oblong membranaceous vessel, with two cells, which is very elastic, containing two roundish compressed seeds.

The Species are,

1. BARLERIA foliis ovatis, pedunculis dichotomis paniculatis. Barleria with oval leaves, and flowers growing in panicles, arising at the division of the branches.

2. BARLERIA foliis ovatis petiolis longissimis, floribus lateralibus, pedunculis multifloris. Barleria with oval leaves, having very long foot-stalks, and flowers growing from the side of the branches, many upon each foot-stalk.

3. BARLERIA spinis axillaribus foliis lanceolatis integerrimis floribus verticillatis sessilibus. Barleria with spines on the side of the branches, spear-shaped leaves which are entire, and flowers growing in close whorls round the stalk.

4. BARLERIA spinis axillaribus quaternis foliis integerrimis. Lin. Sp. Pl. 636. Barleria with spines growing by fours from the side of the branches, and entire leaves.

The first sort rises with a hairy branching stalk, four or five feet high, garnished with two oval leaves at every joint; upon short foot-stalks, at every division of the branches, comes out a long foot-stalk, which divides into many smaller, and at each division of these, is placed a single flower, without foot-stalk, of a pale colour; the upper segment being broad, and shaped like the galea, or helmet, the two lateral segments are narrow, and the under one is bent downward, representing the under lip, and is cut into two parts. The germen becomes an oblong membranaceous capsule with two cells, each containing two compressed roundish seeds. This seed-vessel is very elastic, and throws out the seeds with violence on their being touched when ripe.

The second sort rises six or seven feet high, sending out many lateral branches, from the bottom upward, so as to form a sort of pyramid; the leaves are oval. The flowers grow upon branching foot-stalks, which come out from the wings of the leaves, each standing upon a short separate foot-stalk, and are succeeded by elastic seed-vessels, of the same shape with the former.

The third sort hath square stalks, three feet high, garnished with two oblong entire leaves at every joint, above which the flowers come out in whorls surrounding the stalks, and under each whorl there are six sharp spines, which are as long as the empalement of the flowers. The flowers are blue, and have more of the form of the labiated flowers, than any of the other species.

The fourth sort sends out many slender stems from the root, which rise seven or eight feet high, garnished with oval pointed leaves, two growing opposite at each joint, which are attended by four long spines standing cross-ways.

The three first sorts are propagated by seeds, which they annually produce in plenty; but if they are not carefully watched, to gather them as they ripen, their pods burst open and disperse the seeds, which falling upon the neighbouring pots, will come up and furnish young plants.

The roots of these will continue three or four years, but after the second year, they grow too rambling, and the lower parts of the branches naked, so are not so sightly as the young plants; therefore a succession of these should be preserved, and the old ones turned out. When the seeds are

received from abroad, they must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they must be each planted in a separate pot, and plunged into a hot-bed of tanners bark, where they must constantly remain, and managed in the same manner as other tender exoticks from the same countries, giving them water frequently in summer, and letting the fresh air to them every day in warm weather, but in winter they should have little water, and be kept warm. They flower in June, July, and August, and their seeds ripen soon after.

The fourth sort is only propagated by cuttings, which must be planted in pots, and plunged into a moderate hot-bed, where they will take root, and the plants should be kept constantly in the stove. This sort requires plenty of water in summer, and in winter they must be frequently refreshed, but they must not have it in too great quantity.

BASELLA, or climbing Nightshade from Malabar.

The Characters are,

The flower hath no empalement; it is shaped like a pitcher, closed toward the brim. It hath five stamens fastened to the petal. The globular germen, which is situated in the center, supports three slender styles, crowned by oblong stigma. The petal of the flower remains, and incloses a roundish fleshy berry, including one round seed.

The Species are,

1. BASELLA foliis rotundo-cordatis carnosis. Basella with round heart-shaped leaves.

2. BASELLA foliis oblongis flaccidis obtusis. Basella with oblong blunt flaccid fleshy leaves.

The first sort has thick strong succulent stalks and leaves, which are of a deep purple colour. The plant will climb to the height of ten or twelve feet, which will twist round stakes, provided the plants are preserved in the stove; for if they are exposed to the open air, they will not grow so large, nor will they perfect their seeds, except it be in very warm seasons; but if they are placed in the stove, they will often live till the following spring, and produce great quantities of flowers and seeds. The flowers of this plant have no great beauty, but the plant is preserved for the odd appearance of the stalks and leaves.

There is a variety of this with green stalks and leaves, and the flowers are of a whitish green colour, tipped with purple on their edges, but in all other respects the same, so is supposed to be only a feminal variation.

The second sort hath flaccid leaves, smaller flowers and fruit, in which it essentially differs from the first.

These plants are propagated by seeds, which should be sown in a hot-bed in the spring; and when the plants are fit to remove, they should be each planted into a separate pot, and plunged into the tan bed, where they must be treated in the same manner as other tender exoticks. They may also be propagated by cuttings, which should be planted in pots, and plunged into a moderate hot bed of tanners bark, where they will take root in a fortnight or three weeks time, when they should be treated in the same manner as the seedling plants. But as these rise so easily from seeds, so they are seldom propagated any other way, because they are plants of short duration.

These will climb to a considerable height, and send forth a great number of branches, so they should be trained up to a trellise, or fastened to the back of the stove, otherwise they will twist themselves about whatever plants stand near them, which will make a very disagreeable appearance in a stove; whereas, when they are regularly trained to a trellise, they will have a good effect.

From the berries of the first sort I have seen a beautiful colour drawn, but when used for painting, did not continue very long, but changed to a pale colour; though I believe there

there might be a method invented, whereby this beautiful colour might be fixed, so as to become very useful; for I have been assured, that the juice of these berries has been used for staining of calicoes in *India*.

BASILICUM, or BASIL. See *Ocimum*.

BASTERIA, All-spice.

As this plant has no proper title given to it, so I have given it this in honour of my worthy friend Dr. Job Baster, F. R. S. of *Zurick Zee*, in *Holland*, who is a gentleman well skilled in botany, and has a fine garden stored with rare plants, of which he is very communicative to his friends.

The Characters are,

The flower hath a double series of narrow petals, which spread open, and turn inward at their extremity. Under the receptacle is situated an oval germen, surrounded by many short stamina, crowned by obtuse summits. The germen afterward becomes a roundish fruit, compressed at both ends, having cells, containing oblong seeds.

We have but one Species of this genus, viz.

BASTERIA. Basteria with oval leaves placed opposite, and a branching shrubby stalk; commonly called in *Carolina* All-spice.

This shrub grows naturally in *America*; Mr. *Catesby*, who first introduced it into the *English* gardens, procured it from the continent, some hundred miles on the back of *Charles Town*, in *Carolina*.

It seldom rises more than four feet high in this country, dividing into many slender branches near the ground, with two oval leaves, placed opposite at every joint, which are entire; the flowers comes out from the wings of the leaves; they have two series of narrow thick petals, which spread open, and turn inward at the top, like those of the starry Anemone, or the Virgin's Bower: these are of a full purple colour, and have a disagreeable scent; they appear in *May*; the embryo sits beneath the flower, and supports five stigma; this afterward appears to have five cells, but it never comes to perfection in this country, therefore I can only give a description of it, from an imperfect rudiment. The bark of this shrub is brown, and has a very strong aromatick scent; from whence the inhabitants of *Carolina* gave it the title of All-spice, by which it is generally known in the nurseries near *London*.

This shrub will thrive in the open air in *England*, if it be planted in a warm situation, and a dry soil: it is propagated by laying down the young branches, which will take root in one year, and may then be taken from the mother plant, and planted where they are designed to remain, for they do not bear transplanting well, after they are grown to any size.

The best time for laying down the branches is in the autumn, but they should not be transplanted till the spring twelve months after; for the spring is the safest time to remove these plants. After the branches are laid down, there should be some old tanners bark laid upon the surface of the ground, to keep out the frost, which should also be done every winter, while the plants are young, which will prevent the frost from penetrating to their roots, and thereby secure them.

BAUHINIA, Mountain Ebony.

The Characters are,

The flower is composed of five petals. It hath ten stamina: the oblong germen sits upon the foot-stalk, which afterward becomes a long taper pod, inclosing a row of roundish compressed seeds.

The Species are,

1. BAUHINIA foliolis obliquis emarginatis caule aculeato, floribus spicatis terminalibus. Prickly Bauhinia with a round indented leaf.

2. BAUHINIA caule inermi foliis cordatis lobis acutis glabris, floribus spicatis terminalibus. Bauhinia with a smooth stalk, heart-shaped smooth leaves with pointed lobes, and spikes of flowers terminating the branches.

3. BAUHINIA foliis ovatis lobis acuminatis semi-ovatis. *Lin. Sp. Pl.* 375. Bauhinia with oval leaves, and pointed lobes which are half oval.

4. BAUHINIA foliis oblongo-cordatis, lobis acuminatis parallelis trinerviis, siliquis planis. Bauhinia with oblong heart-shaped leaves, with pointed parallel lobes, having three ribs, and plain flat pods.

5. BAUHINIA caule aculeato, foliis cordatis lobis orbiculatis subtus tomentosis. Bauhinia with a prickly stalk, and heart-shaped leaves with round lobes, which are woolly on their under side.

6. BAUHINIA foliis cordatis lobis semi-orbiculatis, floribus paniculatis axillaribus. Bauhinia with heart-shaped leaves, having roundish lobes, and flowers growing in loose spikes from the side of the branches.

7. BAUHINIA foliis subcordatis bipartitis rotundatis caule aculeato, floribus sparsis. Bauhinia with heart-shaped bifid rounded leaves, a prickly stalk, and flowers growing at a distance.

8. BAUHINIA foliis cordatis lobis coadunatis obtusis. *Lin. Sp. Plant.* 375. Bauhinia with heart-shaped leaves, and obtuse lobes which join together.

9. BAUHINIA caule cirrhifero. *Lin. Sp. Pl.* 374. Bauhinia with a stalk having tendrils.

10. BAUHINIA foliis ovatis lobis divaricatis. *Lin. Sp. Pl.* 374. Bauhinia with oval leaves, whose lobes spread different ways, called in *Jamaica* Honeyfuckle.

The first sort grows plentifully in *Jamaica*, and the other islands in *America*, where it rises to the height of sixteen or eighteen feet, with a crooked stem, and divides into many irregular branches, armed with short strong spines, and garnished with compound winged leaves, each having two or three pair of lobes, ending with an odd one, which are oblique, blunt, and indented at the top. The stalks are terminated by several long spikes of yellow flowers, which are succeeded by pods, about three inches long, which have borders, and contain two or three swelling seeds. The pods are glutinous, and have a strong balsamick scent, as have also the leaves when bruised. It is called in *America*, the *Indian Savin tree*, from its strong odour, somewhat resembling the common *Savin*.

The second sort came from *Campeachy*, where it grows naturally. This rises to the height of twelve or fourteen feet, with a smooth stem, dividing into many branches, garnished with heart-shaped leaves, having two smooth pointed lobes; the extremity of every branch is terminated by a long spike of yellow flowers, so that when these trees are in flower, they make a fine appearance. The pods are swelling, and about five inches long, each containing five or six roundish compressed seeds.

The third sort grows naturally in both *Indies*, where it rises with several pretty strong, upright, smooth stems, which send out many slender branches on every side, garnished with leaves, deeply divided into two oval lobes. The leaves come out without order, and have long foot-stalks, but are much thinner than those of the species before-mentioned. The flowers come out at the extremity of the branches, three or four in a loose bunch; the petals are red, or striped with white, others are plain upon the same branch; the stamina and style are white, and stand out beyond the petals. These flowers are succeeded by long flat pods of a dark brown colour, each containing five or six roundish compressed seeds. The wood of this tree is very hard, and veined with black, from whence the inhabitants of *America* call it *Mountain Ebony*.

The fourth sort grows naturally at *Campeachy*. This rises to the height of twenty feet, with a smooth stem, which divides into many small branches, garnished with oblong heart-shaped leaves, having two pointed parallel lobes, which

which have each three longitudinal veins. The leaves are placed alternately on the branches, which are terminated by loose bunches of white flowers; these are succeeded by very long narrow compressed pods, which have eight or ten compressed roundish seeds in each.

The fifth sort seldom rises more than ten feet high, dividing into many irregular branches, which are armed with short crooked spines; the leaves grow alternate, are heart-shaped, and have two roundish lobes; they are woolly on their under side, and have short foot-stalks. The flowers grow at the extremity of the branches, two or three together; these are large, and of a dirty white colour, and are succeeded by short flat pods, each containing two or three seeds.

The sixth sort grows naturally at *La Vera Cruz*. It rises to the height of twenty-five, or thirty feet, with many irregular stems, garnished with heart-shaped leaves, having two roundish lobes. The flowers come out in loose spikes at every joint from the wings of the leaves, with naked foot-stalks, and are of a dry white colour. These are succeeded by oblong compressed pods, each containing three or four compressed seeds.

The seventh sort grows naturally at *Cartagena*, in *New Spain*. This rises twenty feet high, with a strong upright stem, which sends out many branches, which are armed with spines growing by pairs. The leaves grow alternately, and are heart-shaped, with two rounded lobes. The flowers are large and white, coming out thinly at the end of the branches. The petals of these are near two inches long, and spread open wide; these are succeeded by long flat pods, which are narrow, each containing five or six seeds.

The eighth sort grows naturally in both *Indies*. It rises with a strong stem, upward of twenty feet high, dividing into many strong branches, which are garnished with heart-shaped leaves, having obtuse lobes. The flowers grow in loose panicles at the extremity of the branches, which are large, and of a purplish red colour, marked with white, and have a yellow bottom. These have a very agreeable scent. The flowers are succeeded by compressed pods, about six inches long, and three quarters of an inch broad, containing three or four compressed seeds in each.

The ninth sort grows naturally in both *Indies*, where it rises with many slender stalks, which put out tendrils, and fasten themselves to the neighbouring trees, whereby they rise to a great height; the leaves are heart-shaped, standing upon long foot-stalks, and are deeply cut into two pointed lobes, each having three prominent ribs running longitudinally.

The tenth sort grows naturally in great plenty on the north side of the island of *Jamaica*, where it is called Upright Honeyfuckle. This is a low shrub, seldom rising more than five or six feet high, but divides into several branches, garnished with oval leaves, divided into two lobes, which spread from each other. The flowers grow in loose panicles at the end of the branches, which are white, and have a very agreeable scent. The flowers are succeeded by taper pods, about four inches long, each containing four or five roundish compressed seeds, of a dark colour.

All these plants are natives of the warm countries, so will not thrive in *England*, unless they are kept in a warm stove. They are propagated by seeds, which must be procured from the countries where they grow naturally, for they do not perfect their seeds in *England*.

The seeds should be sown in pots, and plunged into a moderate hot-bed of tanners bark; if they are good, the plants will come up in about six weeks, and in a month or six weeks after, will be fit to transplant, when they should be carefully shaken out of the seed pot, so as not to tear

off the roots, and each planted into a separate small pot, and plunged into the hot-bed again, being careful to shade them until they have taken fresh root, after which they should have fresh air admitted to them every day in warm weather. In the autumn they must be placed in the bark stove, and treated in the same way as other tender exoticks, giving them but little water in winter.

BAY. See *Laurus*.

BEANS. See *Faba*.

KIDNEY or FRENCH BEANS. See *Phaseolus*.

BEAN-TREFOIL. See *Cytisus*.

BEAR'S-EAR. See *Auricula*.

BEAR'S-EAR SANICLE. See *Verbascum*.

BEAR'S-FOOT. See *Helleborus*.

BECABUNGA, or Brook-lime.

This is a sort of *Veronica*, or Water Speedwell; of which there are two sorts, one with a long leaf, and the other round; they are both very common in ditches, and watery places, almost every-where in *England*; the second sort is used in medicine.

BEE, or GNAT-FLOWER. See *Orchis*.

BEECH-TREE. See *Fagus*.

BELL-FLOWER. See *Campanula*.

BELLADONA. See *Atropa*.

BELLIS, the Daisy.

The Characters are,

It hath a radiated discous flower, composed of many hermaphrodite flowers in the disk, and female florets which form the border, or rays, included in a common empalement. The hermaphrodite flowers have an oval germen, attended by five short stamina; the germen afterward becomes a single naked seed placed vertically.

The Species are,

1. *BELLIS scapo nudo uniflora*. Hort. Cliff. 418. Daisy with a naked stalk, having one flower.
2. *BELLIS caule subfolioso*. Lin. Sp. Pl. 887. Daisy with leaves on the lower part of the stalk.
3. *BELLIS hortensis flore pleno majore*. C. B. P. 261. Garden Daisy with a larger double flower.

The first sort is the common Daisy, which grows naturally in pasture land in most parts of *Europe*, and is often a troublesome weed in the grass of gardens, so is never cultivated.

The second sort is a low annual plant, which grows naturally on the *Alps*, and the hilly parts of *Italy*. This seldom rises more than three inches high, with an upright stalk, which is garnished with leaves on the lower part, but the upper part is naked, supporting a single flower like that of the common Daisy, but smaller.

The Garden Daisy is generally supposed to be only a variety of the wild sort, which was first obtained by culture. This may probably be true, but there has not been any instance of late years of the wild sort having been altered by culture; nor have I ever observed the Garden Daisy to degenerate to the wild sort, where they have been some years neglected, though they have altered greatly with regard to the size and beauty of their flowers; therefore I shall not consider them as distinct species, but shall only mention the varieties, which are cultivated in the gardens.

1. The red and white Garden Daisy, with double flowers.
2. The double variegated Garden Daisy.
3. The Childing, or Hen and Chicken Daisy.
4. The Cockscorn Daisy, with red and white flowers.

The Garden Daisies flower in *April* and *May*, when they make a pretty variety, being intermixed with plants of the same growth; they should be planted in a shady border, and a loamy soil without dung, in which they may be preserved without varying, provided the roots are transplanted and parted every autumn; which is all the culture they require, except the keeping them clear from weeds.

BELLIS MAJOR. See Chrysanthemum.

BELLONIA.

The Characters are,

The flower is wheel-shaped, of one leaf, with a short tube, but spread open above, and cut into five obtuse segments. It hath five stamina, which close together. The germen is situated under the receptacle of the flower, which afterward becomes an oval turbinated seed vessel, ending in a point, having one cell filled with small round seeds.

We have but one Species of this plant, viz.

BELLONIA. Lin. Sp. Plant. 172. Shrubby Bellonia with a rough Balm leaf.

This plant is very common in several of the warm islands in America.

It hath a woody stem, which rises ten or twelve feet high, sending out many lateral branches, garnished with oval rough leaves placed opposite; the flowers come out from the wings of the leaves, in loose panicles, which are of the wheel shape, of one leaf, divided into five parts; these are succeeded by oval capsules, ending in a point, which are full of small round seeds.

It is propagated by seeds, which should be sown in a pot, and plunged into a hot-bed of tanners bark. When the plants are come up half an inch high, they should be carefully transplanted into pots, and plunged into the hot-bed again, observing to water and shade them until they have taken root; after which time they should have air admitted to them every day, when the weather is warm, and frequently watered. In autumn they must be plunged into the bark stove, and treated in the same manner as other tender exotics. The second year these plants will sometimes flower; but they rarely produce good seeds in this climate; however, they may be propagated by cuttings in the summer months, provided they are planted in light earth on a moderate hot-bed, and carefully watered and shaded until they have taken root.

BELVEDERE. See Chenopodium.

BENZOIN, the Benjamin Tree. See Laurus.

BERBERIS, the Barberry, or Pipperidge Bush.

The Characters are,

The flower hath a coloured empalement, composed of six concave leaves; the flower is of six leaves, which are roundish and concave. It hath two coloured nectariums, fastened to the base of each petal, and six stamina, with two summits fastened on each side their apex. The germen is cylindrical, and afterward becomes an obtuse cylindrical umbilicated berry, having a puncture, and one cell, inclosing two cylindrical seeds.

The Species are,

1. BERBERIS pedunculis racemosis. Mat. Med. 290. The Common Barberry.

2. BERBERIS foliis obversè ovatis. Canada Barberry with very broad leaves.

3. BERBERIS pedunculis unifloris. Lin. Sp. Pl. 331. Barberry with a single flower on each foot-stalk.

The first sort grows naturally in the hedges in many parts of England, but is also cultivated in gardens for its fruit, which is pickled, and used for garnishing dishes. This shrub rises with many stalks from the root, to the height of eight or ten feet, which have a white bark, yellow on the inside; the stalks and branches are armed with sharp thorns, which commonly grow by threes; the leaves are oval, obtuse, and slightly sawed on their edges. The flowers come out from the wings of the leaves, in small ramose bunches, like those of the Currant bush, which are yellow; these are succeeded by oval fruit, which are first green, but when ripe turn to a fine red colour. The flowers appear in May, and the fruit ripens in September.

This sort is generally propagated by suckers, which are put out in great plenty from the root; but such plants are

very subject to send out suckers in greater plenty than those which are propagated by layers, therefore the latter method should be preferred. The best time for laying down the branches, is in the autumn, when their leaves begin to fall; the young shoots of the same year are the best for this purpose; these will be well rooted by the next autumn, when they may be taken off, and planted where they are designed to remain. Where this plant is cultivated for its fruit, it should be planted single, (not in hedges, as was the old practice) and the suckers every autumn taken away, and all the gross shoots pruned out: by this method the fruit will be much fairer, and in greater plenty, than upon those which are suffered to grow wild.

The Canada sort was more common in the English gardens, some years past, than at present. The leaves of this are much broader, and shorter than those of the common sort, and the fruit is black when ripe. This may be propagated in the same way as the common sort, and is equally hardy.

The Box-leaved sort is at present very rare in England, and while young, the plants are somewhat tender, so have frequently been killed by severe frost. This never rises more than three or four feet high in England, but sends out many stalks from the root, which are strongly armed with spines at every joint; the leaves are shaped like those of the narrow leaved Box tree; the flowers come out from between the leaves, each upon a slender foot-stalk; but these are not succeeded by fruit in England.

This sort may be propagated by laying down the branches in the same manner as the first; but when the young plants are taken off, they should be planted in pots, and sheltered under a frame in winter, till they have obtained strength, when they may be turned out of the pots, and planted in a warm situation.

BERMUDIANA. See Sisyrrinchium.

BERNARDIA. See Croton.

BESLERIA.

The Characters are,

The flower is of the lip kind, and of one leaf; it hath four stamina in the tube of the flower, two of which are longer than the other, with an oval germen, which afterward becomes an oval berry, with one cell filled with small seeds.

The Species are,

1. BESLERIA pedunculis ramosis, foliis ovatis. Lin. Sp. Pl. 619. Besleria with branching foot-stalks, and oval leaves.

2. BESLERIA pedunculis simplicibus confertis, foliis lanceolatis. Lin. Sp. Pl. 619. Besleria with simple foot-stalks, growing in clusters, and spear-shaped leaves.

3. BESLERIA pedunculis simplicibus solitariis, involucris pentaphyllis. Lin. Sp. Pl. 619. Besleria with stalks growing single, and a five leaved involucre.

The first sort hath a smooth woody jointed stalk; at each joint are placed two oval nervous leaves opposite; the flowers come out from the wings of the leaves, upon short branching foot-stalks, each sustaining six or eight flowers, which stand each upon a separate smaller foot stalk. They are of one leaf, of an anomalous figure, and quinquefid; after the flower is past, the germen becomes an oval soft berry, with one cell filled with small seeds.

The second sort rises with a lignous stem six or seven feet high, dividing toward the top into many irregular branches, garnished with spear-shaped leaves, which have many transverse veins; the flowers come out at the wings of the leaves, in large clusters, each having a separate foot-stalk: these are small, tubulous, of a pale yellow colour, and are succeeded by round soft berries, inclosing many small seeds.

The third sort hath a creeping stalk, which sends out roots at every joint, garnished with oval leaves placed opposite, which have many transverse ribs, and are sharply

sawed on their edges; from the wings of the leaves come out the foot-stalks of the flowers single, each sustaining one tubulous irregular hairy flower, divided at the top into five obtuse parts, with a large five leaved involucre, deeply sawed on the border.

These plants grow naturally in the warm parts of *America*, so are too tender to live in this country, without artificial heat. They are propagated by seeds which should be sown on a hot-bed, and when the plants are come up half an inch high, they should be each transplanted into a small pot, and plunged into a hot-bed of tanners bark, where they should have air and water in proportion to the warmth of the season. When the plants have filled these small pots with their roots, they should be shaken out of them, and put into larger pots, and plunged into the hot-bed again, giving them a large share fresh air in warm weather. In winter they must be removed into the stove, where they must be kept in a temperate warmth, and should be often, but sparingly, watered. The second year these plants will flower, and sometimes they will perfect their seeds in this country; but they must be constantly preserved in the stove.

BETA, the Beet.

The Characters are,

The flower hath a five leaved empalement, which is permanent, but no petal, and five stamina placed opposite to the leaves of the empalement. The germen is situated below the receptacle, which afterward becomes a capsule with one cell, having a single seed, wrapped up in the empalement.

The Species are,

1. BETA *caulibus decumbentibus, foliis triangularibus petiolatis*. Beet with declining stalks and triangular leaves, having foot-stalks.

2. BETA *foliis radicalibus petiolatis, caulibus sessilibus, spicis lateralibus longissimis*. The common white Beet, or Cicla of the shops.

3. BETA *foliis latissimis, radice pyramidato carneso*. Red Beet with a pyramidal root.

The first sort grows naturally on the banks of the sea, and in salt marshes in divers parts of *England*. This has been supposed by many, to be the same with the second species; but I have brought the seeds from the places where they grow naturally, many times, and have cultivated the plants with care, but could not find any of the plants vary from their parent plants in their characters, so that I can make no doubt of its being a distinct species.

The second sort is cultivated in gardens for its leaves, which are frequently used in soups; the root of this sort seldom grows larger than a man's thumb; the spikes of flowers come out from the wings of the leaves, which are long, and have narrow leaves placed between the flowers. The lower leaves of the plant are thick and succulent, and their foot stalks are broad. The varieties of this are, the white Beet, the green Beet, and the *Swiss* or chard Beet. These will vary from one to the other by culture, as I have often experienced, but never alter to the first or third sort.

The third sort hath large thick succulent leaves, which are for the most part of a dark green, or purple colour. The roots of this are large, and of a deep red colour, on which their goodness depends; for the larger these roots grow, the tenderer they will be; and the deeper their colour, the more they are esteemed. The varieties of this are, the common red Beet, the Turnep-rooted red Beet, and the green-leaved red Beet.

The second sort, which is cultivated in gardens for its leaves, which are used in the kitchen, is commonly sown by itself, and not mixed with other crops, the beginning of *March*, upon an open spot of ground, not too moist. When the plants have put out four leaves, the ground should be

hoed, as is practised for Carrots, carefully cutting up all the weeds, and also the plants where they are too near each other, leaving them at least six inches asunder. In three weeks or a month's time, the ground should be a second time hoed over, to cut up the weeds, and thin the plants to a greater distance; for by this time they will be past danger, so should not be left nearer than eight or ten inches, if regard is had to the goodness of the leaves: and if it is of the *Swiss* kind, with broad leaves, the plants must not be nearer than a foot: in six weeks after, the ground should be hoed over a third time; which, if properly done, will destroy all the weeds; so that after this, the plants will spread and prevent the weeds from growing, therefore will want but little cleaning for a considerable time, and the leaves will soon be fit for use, when the outer larger leaves should be first gathered, leaving the small inner leaves to grow larger; so that a small spot of ground will supply a moderate family, and furnish a new supply of leaves the whole year, provided the plants are not permitted to run up to seed, for after that their leaves will not be good.

The red Beet is frequently sown with Carrots, Parsneps, or Onions, by the kitchen gardeners near *London*, who draw up their Carrots or Onions when they are young, whereby the Beets will have room to grow, when the other crops are gathered; but where the crops are not timely removed from them, it will be a better method to sow them separately. This sort requires a deep light soil, for as their roots run deep in the ground, so in shallow ground, they will be short and stringy. The seeds should be sown in *March*, and must be treated in the same manner as the former sort; but the plants should not be left nearer than a foot distance, or in good land a foot and an half, for the leaves will cover the ground at that distance. The roots will be fit for use in the autumn, and continue good all the winter; but in the spring, when they begin to shoot, they will be hard and stringy.

BETONICA, Betony.

The Characters are,

The flower is of one leaf, of the lip kind, with a cylindrical incurved tube; the upper lip is roundish, plain, erect, and entire; the lower lip is cut into three parts. It hath four stamina, two long and two shorter, which incline to the upper lip. The germen is quadripartite, which afterward becomes four naked oval seeds, lodged in the empalement.

The Species are,

1. BETONICA *spicâ interraptâ, corollarum laciniâ labii intermediâ emarginatâ*. *Flor. Leyd. Prod.* 316. Betony with an interrupted spike, and the middle segment of the lower lip of the flower indented at the end. This is the *Betonica purpurea*. *C. B. P.* 235. Purple or Wood Betony.

2. BETONICA *foliis radicalibus ovato-cordatis, caulibus lanceolatis obtusis spicâ crassiore*. Greater *Danish* Betony.

3. BETONICA *foliis triangularibus obtusis spicâ brevior*. The least *Alpine* Betony.

4. BETONICA *spicâ integrâ, corollarum laciniâ labii intermediâ integerrimâ*. *Flor. Leyd. Prod.* 316. Eastern Betony with very long narrow leaves, and a thicker spike of flowers.

5. BETONICA *foliis lanceolatis obtusis incanis spicâ florum crassiori*. Hoary *Italian* Betony, with a fleshy flower.

6. BETONICA *verticillata calycibus spinosis*. *Hort. Upsal.* 165. Annual Field Betony with a yellowish white flower.

7. BETONICA *spicâ basi foliosâ*. *Lin. Sp. Plant.* 573. Yellow Mountain Betony.

The first sort grows naturally in woods, and on shady banks, in most parts of *England*, so is seldom cultivated in gardens. This is the sort which is used in medicine, and is greatly esteemed as a vulnerary herb. There is a variety of this with a white flower, which I have often found growing naturally in *Kent*.

The second sort grows naturally in *Denmark*. This differs greatly from our common sort, the lower leaves being much broader and heart-shaped; those upon the stalks are spear-shaped and rounded at the end, and the stalks are larger, stand upright, and are terminated by thicker spikes of flowers.

The third sort grows naturally upon the *Alps*, where it seldom rises more than four inches high; and when cultivated in a garden, not above seven or eight. The leaves of this are much broader at the base than those of the common sort, and are very different in their shape, being triangular and blunt at the end. The flowers grow in very short close spikes, on the top of the stalks.

The fourth sort hath very long, narrow, hairy leaves, neatly crenated on their edges. The flowers grow in very close thick spikes at the top of the stalks, which are larger, and of a lighter purple colour than those of the common sort.

The fifth sort grows naturally in *Italy*. The leaves of this are broader, and not so long as those of the common sort, and are hoary; the stalks are shorter and much thicker, as are also the spikes of flowers, which are larger and of a flesh colour.

The sixth sort is annual, and grows naturally on arable land in *France, Italy, and Germany*; and if brought into a garden, the seeds will scatter, and produce plenty of the plants without farther care.

The other sorts are perennial plants, which may be propagated by seeds, or parting of their roots. They are all very hardy, but require a shady situation and moist stiff soil, in which they will thrive better than in rich ground.

BETONICA AQUATICA. See Scrophularia.

BETONICA PAULI. See Veronica.

BETULA, the Birch Tree.

The Characters are,

It hath male and female flowers, at separate distances on the same tree; the male flowers are collected in a cylindrical katkin. The flower is composed of three equal florets, fixed to the empalement by a single scale, and have four small stamina. The female flowers grow in a katkin, in the same manner as the male, which are heart-shaped. They have no visible petals, but a short oval germen. It hath no pericarpium, but the seeds are included in the scales of the katkin, which are oval and winged.

The Species are,

1. BETULA foliis ovatis acuminatis serratis. Hort. Cliff. 442. The common Birch tree.

2. BETULA foliis orbiculatis crenatis. Flor. Lap. 266. Dwarf Birch with roundish leaves.

3. BETULA foliis cordatis oblongis acuminatis serratis. Lin. Sp. Plant. 983. Birch tree, with oblong pointed heart-shaped sawed leaves.

4. BETULA foliis rhombico-ovatis acuminatis duplicato-serratis. Lin. Sp. Pl. 982. Black Virginia Birch tree.

The first is the common Birch tree, which is so well known as to need no description. This is not much esteemed for its wood, but however it may be cultivated to advantage upon barren land, where better trees will not thrive; for there is no ground so bad, but this tree will thrive in it; for it will grow in moist springy land, or in dry gravel or sand, where there is little surface: so that upon ground which produced nothing but moss, these trees have succeeded so well, as to be fit to cut in ten years after planting, when they have been sold for near 10 l. per acre standing, and the after produce has been considerably increased. And as many of the woods near *London*, which were chiefly stocked with these trees, have been of late years grubbed up, so the value of these plantations have advanced in proportion. Therefore those persons who are possessed of such poor land, cannot employ it better, than by planting it with these trees, especially as the expence of doing it is not great.

The best method to cultivate this tree, is to furnish yourself with young plants from the woods, where they naturally grow, and are generally found there in great plenty; but in places where there are no young plants to be procured near, they may be raised from seeds, which should be carefully gathered in the autumn, as soon as the scales under which they are lodged begin to open, otherwise they will soon fall out and be lost: the seeds are small, so should not be buried deep in the ground. The autumn is the best season to sow them, and in a shady situation, the plants will thrive better than when they are exposed to the full sun; for in all places where there are any large trees, their seeds fall, and the plants come up well without care; so that if the young plants are not destroyed by cattle, there is generally plenty of them, in all the woods where there are any of these trees. These wild plants should be carefully taken up, not to injure their roots. The ground where they are to be planted, will require no preparation; all that is necessary to be done, is to loosen the ground with a spade or mattock, in the places where the plants are to stand, making holes to receive their roots, covering them again when the plants are placed, closing the earth hard to their roots. If the plants are young, and have not much top, they will require no pruning; but where they have bushy heads, they should be shortened to prevent their being shaken and displaced by the wind. When the plants have taken root, they will require no other care, but to cut down the great weeds which would over-hang the plants, being careful not to cut or injure the young trees. This need not be repeated oftener than twice in a summer the two first years, after which time the plants will be strong enough to keep down the weeds, or at least be out of danger from them.

These may be planted any time from the middle of *October* till the middle of *March*, when the ground is not frozen; but in dry land the autumn is the best season, and the spring for moist. The distance which they should be planted, is four feet square, that they may soon cover the ground, and by standing close they will draw each other up; for in situations where they are much exposed, if they are not pretty close, they will not thrive so well.

If the plants take kindly to the ground, they will be fit to cut in about ten years; and afterward they may be cut every seventh or eighth year, if they are designed for the broom-makers only; but where they are intended for hoops, they should not be cut oftener than every twelfth year.

The broom-makers are constant customers for Birch, in all places within twenty miles of *London*, or where it is near water carriage: in other parts the hoop-benders are the purchasers; but the larger trees are often bought by the turners, and the wood is used for making ox-yokes, and other instruments of husbandry.

In some of the northern parts of *Europe*, the wood of this tree is greatly used for making of carriages and wheels, being hard and of long duration. In *France* it is generally used for making wooden shoes. It makes very good fuel.

In some places these trees are tapped in the spring, and the sap drawn out to make Birch wine, which has been recommended for the stone and gravel, as is also the sap unfermented. The bark of the Birch tree is almost incorruptible. In *Sweden* the houses are covered with it, where it lasts many years. It frequently happens, that the wood is entirely rotten, and the bark perfectly sound and good.

The second sort grows naturally in the northern parts of *Europe*, and upon the *Alps*; this seldom rises above two or three feet high, having slender branches, garnished with round leaves, but seldom produces either male or female flowers here. It is preserved in some curious gardens for the sake of variety, but is a plant of no use.

The third and fourth sorts grow naturally in *North America*. In *Canada* these trees grow to a large size, where the third sort is called *Merisier*. The natives of that country make canoes of the bark of these trees, which are very light, and of long duration.

Both these sorts may be propagated by seeds, in the same manner as the first, and are equally hardy.

BIDENS. *Tourn. Inst. R. H.* 362. Water Hemp Agrimony.

The Characters are,

It hath a compound flower, the middle or disk is composed of hermaphrodite flowers; these have five stamina, with an oblong germen. The female flowers which compose the border are naked; these are all succeeded by a single angular obtuse seed, having two or more bristles or teeth.

There are several species of this plant, which are seldom admitted into gardens, some of which are common weeds in *England*, therefore I shall only mention those which are frequently preserved in the gardens of the curious.

1. BIDENS foliis pinnatis serratis semiuibus erecto-constantibus calycibus frondosis corollis radiatis. *Lin. Sp. Plant.* 832. Broad-leaved *Canada* Hemp Agrimony, with a yellow flower.

2. BIDENS foliis oblongis integerrimis caule dichotomo floribus solitariis sessilibus. *Lin. Sp. Pl.* 832. Hemp Agrimony with oblong entire leaves, a stalk divided into two parts, and a single flower growing close to the stalk.

3. BIDENS foliis simplicibus serratis petiolatis, floribus globosis, pedunculis elongatis seminibus levibus. *Lin. Sp. Plant.* 833. Hemp Agrimony with single sawed leaves having foot-stalks, globular flowers with longer foot-stalks, and smooth seeds.

4. BIDENS calyce oblongo squamoso seminibus radii corolla non decidua coronatis. *Juss.* Hemp Agrimony with an oblong scaly empalement, and the seeds crowned by the rays of the florets, which are permanent. This plant is now titled *Zinnia* by *Linnaeus*.

5. BIDENS foliis ovatis serratis petiolatis, caule fruticoso. *Hort. Cliff.* 399. Hemp Agrimony with oval sawed leaves having foot-stalks, and a shrubby stalk.

The first sort grows naturally in *Virginia*, *Maryland*, and *Canada*, where it is often a troublesome weed. It rises from three to four feet high, sending out many horizontal branches garnished with trifoliate leaves, deeply sawed on their edges; the flowers are produced at the end of the branches, in small clusters, which are yellow, and succeeded by oblong square seeds, having two crooked horns, by which they fasten themselves to the clothes of those who pass near them. This is an annual plant, which decays soon after the seeds are ripe.

The second sort grows naturally in warm countries. It is an annual plant, which rises near three feet high, dividing into several branches, which are garnished with oblong entire leaves; the flowers come out single at the divisions of the branches, sitting close; these are white, and succeeded by smooth seeds.

This sort must be sown upon a moderate hot-bed in the spring, and afterward treated like other hardy annual plants, planting them into the full ground the latter end of *May*. They will flower in *June*, and their seeds ripen in autumn, soon after which the plants will decay.

The third sort grows naturally in *South Carolina*, and also at *Campacky*. This is also an annual plant, which rises three feet high; the leaves come out by pairs at each joint, upon long slender foot-stalks. The flowers grow at the extremity of the branches, in small globular heads, which are very white, and are succeeded by smooth seeds. This must be sown upon a hot-bed, and treated as the former. It flowers and seeds about the same time.

The fourth sort grows naturally in *Peru*. It rises to the height of four feet; the stalks are ligneous, and divide into many branches, garnished with oblong smooth leaves, by

pairs: at the extremity of the branches the flowers are produced, each standing single. This empalement is composed of many scales, placed *imbricatum*, like the tiles on a house, and closely embrace the flower. The whole flower continues, and never falls off; so that when the seeds are ripe, the rays of the flower are remaining firm, and adhere so closely to the seeds, as to render it difficult to part them.

The seeds of this plant must be sown upon a hot bed in the spring, and the plants must be transplanted to another hot-bed, to bring the plants forward, but must not be drawn too weak; therefore when the weather is favourable, they should have a large share of air admitted to them. By the beginning of *June* they should be inured to the open air, and about the middle of that month, they should be transplanted, with balls of earth to their roots, some of them into pots, and others into warm borders, shading them until they have taken root. In *July* the plants will flower, and the seeds are ripe in *October*; but in wet cold seasons the seeds will not ripen in *England*, unless the plants are sheltered under glasses.

The fifth sort rises with a shrubby stalk, to the height of six or seven feet. The flowers are produced at the end of the branches in small clusters, each standing upon a long naked foot-stalk; and are succeeded by flat seeds, having two short teeth at their extremity. This sort grows naturally in *Carthagena* in *New Spain*. It is propagated by seeds, which should be sown on a hot-bed in the spring; and the plants must be each planted into a separate small pot, and plunged into a fresh hot-bed, and treated as other tender plants from the same countries, and in autumn placed in the stove: the following summer they will flower and produce seeds, but the plants will abide some years with proper management.

BIFOLIUM, Twyblade. See *Ophrys*.

BIGNONIA. *Tourn. Inst.* 164. Trumpet Flower, or Scarlet Jasmine.

The Characters are,

The flower is of the ringent, or grinning kind, tubulous, with long chaps, which are swelling, and bell shaped; it hath four stamina shorter than the petal, two longer than the other. In the center is an oblong germen, which afterward becomes a bivalve pod, with two cells, filled with compressed winged seeds, lying over each other *imbricatum*.

The Species are,

1. BIGNONIA foliis pinnatis, foliolis incis, geniculis radicatis. *Lin. Hort. Cliff.* 217. Bignonia with winged leaves, which are cut on their edges, and roots coming out at their joints, commonly called Trumpet Flower.

2. BIGNONIA foliis pinnatis minoribus, foliolis mucronatis, marginibus serratis geniculis radicatis. Bignonia with smaller winged leaves, ending in a sharp point, sawed on their edges, and roots coming from the joints.

3. BIGNONIA foliis simplicibus cordatis, caule erecto, floribus diandris. *Lin. Sp. Pl.* 622. Commonly called *Catalpa*.

4. BIGNONIA foliis pinnatis, foliolis lanceolatis acutis serratis, caule erecto, floribus paniculatis erectis. Bignonia with winged leaves, having acute sawed lobes, an upright stalk, and flowers growing in panicles erect.

5. BIGNONIA foliis conjugatis cirrhosis foliolis cordato-lanceolatis foliis imis simplicibus. *Vir. Cliff.* 59. Bignonia with conjugated leaves, having tendrils and a short pod.

6. BIGNONIA foliis conjugatis, cirrho brevissimo arcuato tripartito. *Lin. Sp. Plant.* 623. Bignonia with leaves by pairs, and short arched tendrils, divided into three parts, and a very long pod.

7. BIGNONIA foliis conjugatis cirrhosis, foliolis ovatis acuminatis undatis perennantibus. Bignonia with jointed leaves, having tendrils, whose lobes are oval, pointed, waved, and ever-green.

8. *BIGNONIA foliis simplicibus lanceolatis caule volubili.* *Lin. Sp. Plant.* 623. Bignonia with single spear-shaped leaves, and a twining stalk, called sweet-scented Jasmine in *Carolina*.

9. *BIGNONIA foliis digitatis integerrimis.* *Hort. Cliff.* 497. Bignonia with fingered leaves, which are entire.

10. *BIGNONIA foliis conjugatis cirrhosis, foliolis cordato-ovatis, floribus racemoso-paniculatis.* *Lin. Sp. Pl.* 623. Bignonia with jointed leaves, having tendrils, the lobes oval and heart-shaped, and flowers in branching panicles.

11. *BIGNONIA foliis bipinnatis foliolis lanceolatis integris.* *Lin. Sp. Plant.* 625. Bignonia with double winged leaves, which are entire and spear-shaped, commonly called Bastard Guajacum.

12. *BIGNONIA foliis conjugatis cirrhosis foliolis cordatis foliis imis ternatis.* *Vir. Cliff.* 60. Bignonia with jointed heart-shaped leaves, having tendrils, and the under leaves trifoliate.

The first sort grows naturally in *Virginia* and *Canada*. The second grows naturally in *Carolina*, but have both been old inhabitants in some of the *English* gardens, but the first is the most common in *Europe*.

These plants when old have large rough stems, which send out many weak trailing branches, putting out roots at their joints, which fasten themselves to the trees in their natural places of growth, whereby they climb to a great height; and in *Europe*, where they are generally planted against walls, they fasten themselves thereto by their roots, which strike into the mortar of their joint so strongly, as to support their branches, and will rise to the height of forty or fifty feet. The branches are garnished with winged leaves placed opposite, which are composed of four pair of small leaves, terminated by an odd one. The flowers are produced at the ends of the shoots of the same year, in large bunches; they have long swelling tubes, shaped somewhat like a trumpet, from whence they had the appellation of Trumpet Flower; they are of an Orange colour, and appear the beginning of *August*.

The second sort is like the first, but the leaves are smaller; the lobes are placed closer, and the flowers are not so large, and of a paler red colour.

Both these sorts are very hardy, so will thrive in the open air; but as they have trailing branches, so they must be supported; therefore they are usually planted against walls, or buildings, where, if they have room, they will rise very high, so are very proper for covering of buildings, which are unsightly.

They are propagated by seeds, but the young plants so raised do not flower in less than seven or eight years; therefore those which are propagated by cuttings or layers, from flowering plants, are most esteemed, because they will flower in two or three years after planting. The old plants also send out many suckers from their roots, which may be taken off, and transplanted where they are to remain, for these plants will not transplant safely if they are old.

The third sort was brought into *England* by Mr. *Catesby*, who found it growing naturally on the back of *South Carolina*, at a great distance from the *English* settlements, and brought the seeds to *Charles Town*, where the inhabitants have propagated it, and dispersed it through most of the *English* settlements in *North America*, and is now very plenty in the *English* gardens near *London*.

This sort rises with a strong stem, covered with a smooth brown bark, dividing into many branches, which are garnished with very large heart shaped leaves, placed opposite at every joint. The flowers are produced in large branching panicles at the end of the branches, of a dirty white colour, with a few purple spots, and faint stripes of yellow on their inside, and waved on their edges. The flowers are in *America* succeeded by very long taper pods, filled with flat

winged seeds, lying over each other like the scales of fish. These plants, when young, are frequently injured by frost, for as they shoot pretty late in the autumn, so the early frosts often kill the extremity of their branches; but as the plants advance in strength, so they become more hardy, and are seldom injured but in very severe winters. It is late in the spring before these trees come out, which has often caused persons to believe they were dead, and some have been so imprudent, as to cut them down on that supposition, before the tree was so well known.

It may be propagated by cuttings, which should be planted in pots in the spring before the trees begin to push out their shoots, and plunged into a moderate hot-bed. In about six weeks these will have taken root, and made shoots above, therefore should have air admitted to them constantly, and hardened by degrees to bear the open air, into which they should be removed for the summer, but in winter will require some shelter, and the spring following planted out into a nursery bed, where they may stay two years to get strength, and then may be removed to the place where they are to remain.

As these trees have very large leaves, so they require a sheltered situation, for where they are much exposed to strong winds, their leaves are often torn and rendered unsightly, and many times their branches are split and broken by the winds, their leaves being so large, that the wind has great force against them. They delight in a light moist soil, where they make great progress, and in a few years will produce flowers.

The fourth sort is a native of the warmer parts of *America*. This rises with an upright stem, to the height of twelve or fourteen feet, sending out many branches, garnished at every joint, by two long winged leaves placed opposite; the small leaves which compose these, are long and spear-shaped, ending in a point. The flowers are produced in loose panicles at the end of the branches, and are shaped like those of the other species, but spread open more at the top. They are yellow, and are succeeded by compressed pods about six inches long, having two rows of flat winged seeds, like those of the other species.

This sort is propagated by seeds; which must be sown on a hot-bed; and the plants afterward transplanted into separate small pots, and plunged into a fresh hot bed, to bring the plants forward, that they may obtain strength before winter; in the autumn they must be removed into the bark stove, and during the winter should have but little water. The plants should constantly remain in the bark stove, and be treated in the same manner as other tender plants from those countries. The third year from seed they will flower, but they do not produce seeds in *England*.

The fifth sort grows naturally in several parts of *North America*; this hath very slender trailing stalks, which must be supported; so they require the assistance of a wall, and to have a good aspect, for they are impatient of much cold: the branches are clothed with oblong leaves, which remain green all the year; these are often single at bottom, but upward are placed by pairs opposite at each joint; the flowers are produced at the wings of the leaves, which are shaped like those of the Foxglove, and are yellow. This is propagated either by seeds, or layers; the seeds should be sown on a moderate hot-bed, and the plants, when they have obtained strength, should be removed into the open air to harden them; but the first winter they will require a little shelter, and the following spring may be planted where they are to remain.

The sixth sort hath slender stalks like the former, which require the same support; these are garnished with small oval leaves, which are entire, placed opposite by pairs at every joint; at the same places come out the tendrils, by which

which they fasten themselves to the plants which grow near them; the flowers come out from the wings of the leaves, which are shaped like those of the former sort, but are smaller. This grows naturally in *Carolina*, and the *Bahama Islands*, but will live in the open air, if it is planted against a wall to a south aspect, and sheltered in very severe frost. It is propagated in the same manner as the former sort.

The seventh sort hath very weak slender branches, which put out tendrils at the joints: at each joint there are four leaves, two on each side; these are oval pointed, and waved on their edges, of a bright green; the branches ramble very far where they have room.

The eighth sort grows naturally in *South Carolina*, where it spreads over the hedges, and at the season of flowering, perfumes the air to a great distance; it also grows in some parts of *Virginia*, but not in so great plenty as at *Carolina*; the inhabitants there call it Yellow Jasmine, I suppose from the sweet odour of its flowers.

This rises with slender stalks, which twist themselves round the neighbouring plants, and mount to a considerable height; the branches are garnished with oblong pointed leaves, which come out single and opposite to each other at every joint. The flowers come out from the wings of the leaves sometimes by two, at other times four, at each joint; these stand erect, are trumpet-shaped, yellow, and have a very sweet scent, and in the countries where they naturally grow, they are succeeded by short taper pods, filled with small winged seeds.

The plants of this sort, when young, are impatient of cold, so must be sheltered in the winter until they have obtained strength, when they should be planted against a warm wall, and in winter protected from frost by coverings of mats, and the ground about their roots covered with tan. It is propagated by seeds, in the same manner as the former sorts.

The ninth sort grows naturally in *Jamaica*. This rises with an upright stem, near twenty feet high, sending out many lateral branches, which are covered with a white bark. The leaves come out opposite at the joints, upon long foot-stalks; these are composed of five oval stiff leaves, which are joined in one center at their base. They are of a pale green, inclining to white on their under side; the flowers are produced at the ends of the branches, four or five together, on very short foot-stalks; they are narrow at bottom, but the tube enlarges upward, and at the top spreads open wide, and are of a pale bluish colour, and smell sweet, and are in *America* succeeded by taper crooked pods about four inches long, which are filled with oval compressed seeds, with wings of a silver colour.

This sort is a native of the warmer parts of *America*, therefore will not thrive in this country, but in a stove. It is propagated by seeds, which must be sown on a hot-bed, and the plants treated in the same manner as the fourth sort.

The tenth sort rises with lignous stalks, which put out tendrils at the joints, whereby they fasten themselves to the neighbouring plants; the leaves come out on each side the branches, upon pretty long foot-stalks, two at each joint, which are heart-shaped and entire, having a fine hairy down on their under side. The flowers grow in loose spikes at the ends of the branches, which are tubulous, and do not spread much at the top; they are of a Violet colour, and smell very sweet. These in their native country are succeeded by oval, hard, lignous seed vessels, which open in four parts, and are full of compressed winged seeds.

This sort is propagated by seeds, which must be sown on a hot-bed, and the plants must be treated in the same manner as the fourth sort, for they will not thrive in this country unless they are placed in the bark stove.

The eleventh sort grows naturally in the *Bahama Islands*.

This, in the country where it grows naturally, rises to the height of twenty feet, sending out many lateral branches, which are garnished with compound winged leaves, each having eleven alternate wings, with spear-shaped small lobes, which grow alternate, and are entire; at the ends of the branches the flowers are produced in very loose panicles; the foot-stalks branching into three or four, each sustaining a single blue flower; with a long swelling tube, cut into five unequal segments at the top, where it spreads open. The flowers are succeeded by oval seed vessels, which open in two parts, and are filled with flat winged seeds.

The twelfth sort hath a woody stem, which sends out many branches, which have four narrow borders or wings running longitudinally, so as to resemble a square stalk; the leaves are produced by pairs, on each side the branches opposite; they are heart-shaped, smooth, and have short foot-stalks; these have tendrils coming out by their foot-stalks, which fasten themselves to the plants which grow near them, and thereby rise to a great height. The flowers are produced in small clusters from the wings of the leaves, which have pretty long tubes, spread open at the top; they are of a pale yellow colour, and are succeeded by flat pods a foot in length, which have two rows of flat winged seeds, joined to the intermediate partition.

This plant is tender, so must be constantly kept in the bark stove, and treated in the same manner as the fourth sort. It is propagated by seeds, which must be obtained from the country where it grows naturally, for it doth not produce any in *England*.

BIHAI. See *Musa*.

BINDWEED. See *Convolvulus*.

BIRCH TREE. See *Betula*.

BISCUTELLA. *Lin. Gen. Plant.* 724. Buckler Mustard, or Bastard Mithridate Mustard.

The Characters are,

The flower hath four petals, placed in form of a cross; it hath six stamina, four long and two short. In the center is situated an orbicular compressed germen, which afterward becomes a plain compressed erect capsule, with two convex lobes, having two cells, terminated by the rigid style, which is joined to the side of the partition.

The Species are,

1. BISCUTELLA *calycibus nectario utrinque gibbis, filiculis in stylum coeuntibus.* *Lin. Hort. Cliff.* 329. Buckler Mustard, with the cup of the nectarium swelling on each side, and small pods joined to the style.

2. BISCUTELLA *filiculis orbiculato-didymis à stylo divergentibus.* *Hort. Cliff.* 329. Buckler Mustard, with a double orbicular pod, diverging from the style.

3. BISCUTELLA *hirsuta foliis oblongis dentatis semiamplexicaulibus floribus spicatis stylo brevior.* Hairy Buckler Mustard, with oblong indented leaves which half embrace the stalk, flowers growing in spikes, and a shorter style.

4. BISCUTELLA *foliis lanceolato-linearibus hispida, floribus corymbosis terminalibus.* Buckler Mustard, with linear spear-shaped rough leaves, and flowers growing in a corymbus, terminating the stalk.

The first sort grows naturally in the south of *France* and *Italy*, where it rises about a foot high; but in a garden generally grows two feet high, dividing into several branches, having oblong entire leaves a little indented; those on the lower part of the stalk being broader and more obtuse than those on the upper. The flowers are produced at the ends of the branches in loose panicles, of a pale yellow colour; these are succeeded by double round compressed seed vessels, swelling in the middle, where is lodged a single round flat seed.

The second sort grows naturally in the south of *France*, *Italy*, and *Germany*. This hath many long narrow leaves, spreading

spreading near the ground, which are deeply indented on each side, resembling those of Hawkweed, and are hairy; from the center arises the stalk, which divides upward into many branches, having no leaves on them, and are terminated by loose panicles of yellow flowers. These are succeeded by round compressed seed vessels like the former, but are smaller, and the style of the flowers bends from them.

The third sort sends out many oblong hairy leaves, which are slightly indented on their edges; from among these there arises a hairy branching stalk, which grows two feet high, and at each joint is placed one oblong indented leaf, which half embraces the stalk at its base; each branch is terminated by a close spike of pale yellow flowers, which are succeeded by round compressed seed vessels like the other sorts, but the style of the flower, which is joined to them, is shorter than those of the other species.

The fourth sort grows naturally in *Spain* and *Sicily*. This seldom rises more than a foot high; the leaves at the bottom grow upright, they are near four inches long, narrow, stiff, and set on every side with rough prickly hairs. The stalk is single, seldom putting out any side branches, and naked. The flowers are produced in compact clusters at the end of the branches, which are of a deep yellow colour, and shaped like those of the other species.

All these sorts are annual plants, which perish soon after they have perfected their seeds. These should be sown either in spring, or in the autumn, upon a border of light earth, in an open situation, where they are to remain for good. Those which are sown in autumn, the plants will live through the winter without any protection, so will flower earlier the following summer, whereby good seeds may always be obtained; whereas those which are sown in the spring, do, in bad seasons, decay before their seeds are ripe. If their seeds are permitted to scatter, there will be plenty of young plants produced without any care.

BISERRULA. *Lin. Gen. Plant.* 800.

The Characters are,

The flower is papilionaceous, having a large roundish standard, whose edges are reflexed. The wings are oblong, and the keel is of the same length with the wings. It hath ten stamina, nine of which are joined, and the other single. In the center is situated an oblong compressed germen, which afterward becomes a flat narrow pod, indented on both edges like the saw of the sword fish, having two cells, filled with kidney-shaped seeds.

We have but one Species of this genus, which is,

BISSERULA. *Hort. Cliff.* 361. We have no *English* name for this plant.

This is an annual plant, which grows naturally in *Italy*, *Sicily*, *Spain*, and the south of *France*. It sends out many angular stalks, which trail on the ground, and are subdivided into many branches, garnished with long winged leaves, composed of many pairs of lobes, and terminated with an odd one; toward the upper part of the branches come out the pedicle of the flowers, which sustains several small butterfly flowers, of a purplish colour, collected together, which are succeeded by plain pods, indented on both sides the whole length, containing two rows of kidney-shaped seeds.

It is propagated by seeds, which in this country should be sown in the autumn, on a bed of light earth, where the plants are to remain, for they will live in the open air very well. When the plants are come up, they will require no other care, but where they are too near, they should be thinned to about a foot distance from each other. It flowers in *June*, and the seeds ripen in *September*.

BISLINGUA. See *Rufcus*.

BISTORTA, Bistort, or Snakeweed.

There are three different species of this plant, which are found wild in *England*; but as they are seldom planted in gardens, I shall pass them over with only mentioning the common sort, which is used in medicine.

BISTORTA *major, radice minus intortá. C. B.* The common great Bistort, or Snakeweed.

This plant flowers in *May*, and if the season proves moist, will continue to produce new spikes of flowers till *August*: it may be propagated by planting the roots in a moist shady border, either in spring or autumn, which will soon furnish the garden with plants, for it greatly increases by its creeping roots.

BIXA. *Lin. Gen. Plant.* 581. Anotta, by the *French*, Roucou.

The Characters are,

The flower hath a double series of petals, the outer consisting of five, which are large, the inner of the same number and shape, but narrower. It hath a great number of bristly stamina. In the center is situated an oval germen, which afterward becomes an oval heart-shaped capsule, covered with sharp bristles, opening with two valves, with one cell, and filled with angular seeds.

We have but one Species of this genus, viz.

BIXA. *Hort. Cliff.* 211. The Anotta, or Arnotta, by the *French*, Roucou.

This shrub grows naturally in the warm parts of *America*, where it rises with an upright stem, to the height of eight or ten feet, sending out many branches at the top, forming a regular head, garnished with heart-shaped leaves ending in a point, which have long foot-stalks. The flowers are produced in loose panicles at the end of the branches; these are of a pale Peach colour, having large petals, and a great number of bristly stamina of the same colour, in the center. After the flower is past, the germen becomes a heart-shaped, or rather a mitre-shaped seed vessel, covered on the outside with bristles, opening with two valves, and filled with angular seeds, covered with a red pulp or paste, which colours the hands of those who touch it, and is collected for the use of dyers and painters.

This plant is propagated by seeds, which should be sown in a small pot, and plunged into a hot-bed of tanners bark. When the plants are about an inch high, they should be shaken out of the pot and carefully separated, so as not to tear off their tender roots, and each planted in a small pot, and plunged into a fresh hot-bed of tanners bark, observing to shade them until they have taken new root; after which they must be treated as other tender plants from the same country, by admitting fresh air to them in proportion to the warmth of the season; when the heat of the tan declines, it should be turned up from the bottom, and, if necessary, some fresh tan added to renew the heat. If the plants are raised early in the spring, and properly managed, they will be a foot and an half high by the autumn, when they should be removed into the bark stove, and plunged into the tan bed. During the winter, they must have but little water, and while the plants are young, they must have a good share of warmth, otherwise they are very subject to cast their leaves, and frequently lose their tops, which renders them unsightly. They must be constantly kept in the bark stove, otherwise they will not thrive well in *England*.

BLADDER NUT. See *Staphylea*.

BLATTARIA. See *Verbasum*.

BLITUM. *Lin. Gen. Plant.* 14. Strawberry Elite.

The Characters are,

The flower hath no petals, but one bristly stamina the length of the empalement. In the center is situated an oval pointed germen; the empalement afterward becomes an oval compressed capsule, including one globular compressed seed, the size of the capsule.

The Species are,

1. **BLITUM capitellis spicatis terminalibus.** *Hort. Upsal.* 3. Blite with spikes terminated by little heads, commonly called Strawberry Blite, or Strawberry Spinage.

2. **BLITUM capitellis sparsis lateralibus.** *Hort. Upsal.* 3. Blite with small heads growing scatteringly from the sides of the stalks. The

The first sort grows naturally in *Spain* and *Portugal*, but hath been long preserved in the *Englysh* gardens. This is an annual plant which hath leaves somewhat like those of Spinage; the stalk rises two feet and an half high, the upper part of the stalk hath flowers coming out in small heads, at every joint, and is terminated by a small cluster of the same: after the flowers are past, the little heads swell to the size of Wood Strawberries, and when ripe have the same appearance, being very succulent, and full of a purple juice, which stains the hands of those who bruise them of a deep purple colour.

The second sort grows naturally in the south of *France* and *Italy*. This seldom grows more than one foot high, with smaller leaves than the first, but of the same shape; the flowers are produced at the wings of the leaves, almost the length of the stalk, which are small, and collected in little heads, which are shaped like those of the first, but smaller, and not so deeply coloured.

These are annual plants, which will drop their seeds if permitted, and the plants will come up in plenty the following spring: or if the seeds of either of the sorts are sown in *March* or *April*, upon a bed of common earth, in an open situation, the plants will come up; and, if they are to remain in the place where they are sown, will require no other care but to thin them out, so as to leave them eight or ten inches apart: in *July* the plants will begin to shew their berries, when they will make a pretty appearance: but many people transplant these plants into the borders of their flower gardens, and others plant them in pots, to have them ready for removing to court yards, or to place them upon low walls, among other annual flowers to adorn those places.

When these plants are designed to be removed, they should be transplanted before they shoot up their flower stems, for they will not bear transplanting well afterward. They will require to be duly watered in dry weather, otherwise the plants will stint, and not grow to any size: and, as the flower stems advance, they should be supported by sticks; for if they are not, the branches will fall to the ground, when the berries are grown pretty large and weighty.

BLOODWORT. See *Lapathum*.

BOCCONIA.

The Characters are,

The flower hath four narrow petals, with a great number of very short stamina: in the center is situated a roundish germen, contracted at both ends, which afterward becomes an oval fruit, contracted at both ends, having one cell, full of pulp, including a single round seed.

There is but one Species of this genus at present known, which is,

BOCCONIA. *Lin. Sp. Plant.* 505. Branching Bocconia, with a woolly Cow Parsnep leaf.

It is very common in *Jamaica*, and several other parts of *America*, where it grows to the height of ten or twelve feet; having a fruit trunk, as large as a man's arm, which is covered with a white smooth bark. At the top it divides into several branches, on which the leaves are placed alternately. These leaves are eight or nine inches long, and five or six broad; are deeply sinuated, sometimes almost to the mid-rib, and are of a fine glaucous colour. The whole plant abounds with a yellow juice, like the greater Celandine, which is of an acrid nature; so that it is used by the inhabitants of *America*, to take off warts, and spots from the eyes.

It is propagated by seeds, which should be sown in a pot filled with light fresh earth, early in the spring, and plunged into a hot-bed of tanners bark. When the plants are come up, they should be each transplanted into separate small pots, and plunged into the hot bed again; observing to shade the glasses in the heat of the day, until the plants

have taken root, then they should have a large share of air, by raising the glasses of the hot-bed. When the plants have filled these small pots with their roots, they should be shaken out of them, and planted into pots one size larger, and plunged into the bark stove, where they should have a good share of fresh air in warm weather. These plants must be constantly kept in the stove, being too tender to thrive in this country, in any other situation. The singular beauty of this plant renders it worthy of a place in every curious collection; and it seems the *Indians* were very fond of it, for *Hernandez* tells us, the *Indian* kings planted it in their gardens.

BOERHAAVIA. Hogweed.

The Characters are,

The flower hath one bell-shaped petal, which is pentangular and entire. It hath in some species one, and in others two short stamina. The germen is situated below the receptacle, which afterward becomes a single oblong seed, having no cover.

The Species are,

1. BOERHAAVIA caule recto. *Lin. Sp. Pl.* 3. Boerhaavia with an erect stalk.

2. BOERHAAVIA caule diffuso. *Lin. Sp. Pl.* 3. Boerhaavia with a diffused stalk.

3. BOERHAAVIA caule scandente. *Lin. Sp. Plant.* 3. Boerhaavia with a climbing stalk.

4. BOERHAAVIA foliis ovatis, foribus lateralibus compactis, caule hirsuto procumbente. Boerhaavia with oval leaves, flowers coming from the wings of the leaves in close heads, and a hairy trailing stalk.

The first sort was discovered by the late Dr. *Houfston*, at *La Vera Cruz*, in 1731. This rises with an upright smooth stalk, two feet high, at each joint it hath two oval pointed leaves growing opposite, upon foot-stalks, an inch long. At the joints, which are far asunder, come out small side branches, growing erect; these, as also the large stalk, are terminated by loose panicles of flesh-coloured flowers, which are succeeded by oblong glutinous seeds.

The second sort grows naturally in *Jamaica*. This sends out many diffused stalks, a foot and an half long, garnished with small roundish leaves at each joint. The flowers grow very scatteringly upon long branching foot-stalks from the wings of the leaves, as also at the end of the branches, which are of a pale red colour, and are succeeded by seeds like the former.

The third sort sends out several stalks from the root, which divide into many branches, and trail over whatever plants grow near them, and rise to the height of five or six feet; are garnished with heart-shaped leaves, growing by pairs opposite at each joint upon long foot-stalks, which are of the colour and consistence of those of the greater Chickweed. The flowers grow in loose umbels at the extremity of the branches, which are yellow, and are succeeded by small oblong viscous seeds.

The fourth sort sends out many trailing hairy stalks, which divide into smaller branches, which are garnished with oval leaves at every joint; and at the wings of the leaves come out the naked foot-stalks, sustaining a small close head of scarlet flowers, which are very fugaceous, seldom standing more than half a day before their petals drop; these are succeeded by short oblong seeds.

The first, second, and fourth sorts are annual plants, which decay in autumn, but the third sort is perennial. They are all tender plants, so will not thrive in the open air in *England*; they are propagated by seeds, which must be sown on a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a small pot, and plunged into the hot-bed, and treated as other tender exotics. When they are grown too tall to remain under the common frame, a plant or two of each sort should be placed in the stove, the other may be turned out of the pots,

pots, and planted in a warm border, where, if the season proves warm, they will perfect their seeds; but as these are subject to fail in cold seasons, so those in the stove will always ripen their seeds in autumn; the third sort may be preserved in a warm stove two or three years.

BOMBAX. *Lin. Gen. Pl.* 580. Silk Cotton Tree.

The Characters are,

The flower is quinquefid and spreading. It hath many stamina, which are the length of the petal: in the center is situated the round germen. The empalement afterward becomes a large oblong turbinated capsule, having five cells, which are lignous, containing many roundish seeds, wrapped in a soft down.

The Species are,

1. **BOMBAX foliis digitatis caule aculeato.** *Lin. Sp. Pl.* 511. Silk Cotton with fingered leaves, and a prickly stalk.

2. **BOMBAX foliis digitatis caule inermi.** *Lin. Sp. Plant.* 511. Silk Cotton with fingered leaves, and a smooth stalk.

3. **BOMBAX foliis quinque-angularibus villosis, caule geniculato herbaceo.** Silk Cotton with five cornered hairy leaves, and a jointed herbaceous stalk.

The first and second sorts grow naturally in both Indies, where they arrive to a great magnitude, being some of the tallest trees in those countries; but the wood is very light; and not much valued, except for making of canoes, which is the chief use made of them. Their trunks are so large, as when hollowed, to make very large ones.

These trees generally grow with very strait stems; those of the first sort are closely armed with short strong spines; but the second hath very smooth stems, which in the young plants are of a bright green, but after a few years, they are covered with a gray, or Ash-coloured bark, which turns to a brown as the trees grow older. The branches toward the top are garnished with leaves composed of five, seven, or nine oblong smooth little leaves, which are spear-shaped, and join to one center at their base, where they adhere to the long foot-stalk. The flower buds appear at the end of the branches, and soon after the flowers expand, which are composed of five oblong purple petals, with a great number of stamina in the center; when these fall off, they are succeeded by oval fruit, as large as a swan's egg, having a thick lignous cover, which, when ripe, opens in five parts, and is full of a dark short Cotton, inclosing many roundish seeds, as large as small Pease.

The third sort was sent me from the Spanish West-Indies, where it grows naturally, but I do not know to what size; the plants which have been raised here, have soft herbaceous stalks very full of joints, and do not appear as if they would become woody, for the plants of several years growth have soft pithy stems. The leaves come out on long hairy foot-stalks at the top of the plants; these have the appearance of those of the Mallow tree, but are larger, and of a thicker consistence, and on their under side are covered with a short, brown, hairy down, and are cut on their edges into five angles. These plants have not as yet flowered in England, nor have I received any information what flowers they produce, but by the pods and seeds, it appears evidently to be of this genus. The down inclosed in these pods is of a fine purple colour, and I have been informed that the inhabitants of the countries where the trees grow naturally, spin it, and work it into garments, which they wear without dying of any other colour.

The plants of all these sorts are propagated by seeds, which must be sown on a hot-bed in the spring; those of the two first sorts will be strong enough to transplant in a short time after they are up, when they should be each planted in a small pot, and plunged into a moderate hot-bed of tanners bark, being careful to shade them from the sun, till they have taken fresh root, after which they should have a large share of air admitted to them when the weather is

warm, to prevent their being drawn up weak. In this bed they may remain till autumn (provided there is room for the plants under the glasses;) when the heat of the bed declines, the tan should be stirred up, and fresh added to it, and if the plants have filled the pots with their roots, they should be shifted into pots a little larger; but there must be care taken not to over-pot them, for nothing is more injurious to these plants, than to be put into large pots, in which they will never thrive. In the autumn they must be removed into the bark stove, where they must constantly remain, being too tender to thrive in this country, in any other situation. In winter they must have but little wet, especially if they cast their leaves; but in the summer they should be frequently refreshed with water, and in warm weather must have plenty of fresh air admitted to them.

These plants require a large stove where they may have room to grow, but as they are several years old before they flower, in the countries where they grow naturally, so there is little hopes of their producing any in England.

BONDUC. See Guilandina.

BONTIA. *Lin. Gen. Plant.* 709. Barbadoes Wild Olive.

The Characters are,

The flower is of the ringent kind, gaping at the brim; the upper lip is erect, the lower lip is trifid and turns backward. It hath four stamina, two of them being longer than the other. In the center is situated the oval germen, which afterward becomes an oval berry with one cell, including a nut of the same form.

We have but one Species of this genus, viz.

BONTIA. *Lin. Sp. Pl.* Barbadoes Wild Olive.

This plant is greatly cultivated in the gardens at Barbadoes, for making of hedges; than which there is not a more proper plant to thrive in those hot countries, it being an ever-green, and of quick growth. I have been informed, that from cuttings (planted in the rainy season, when they have immediately taken root) there has been a complete hedge, four or five feet high, in eighteen months. In England it is preserved in stoves. It may be raised from seeds, which should be sown on a hot-bed early in the spring, that the plants may acquire strength before winter. When the plants are come up, they must be transplanted out each into a separate small pot, and plunged into a moderate hot-bed of tanners bark, observing to shade them until they have taken root; after which, they must have a large share of air in warm weather, and be often refreshed with water. In winter they must be placed in the stove, where they should have a moderate degree of warmth, and but little water during that season. In summer they may be exposed abroad, in very hot weather, in a sheltered situation. With this management, these plants will produce flowers and fruit in three years from seed. They may also be propagated by cuttings, which should be planted in the spring, before the plants have begun to shoot. These must be put into pots, and plunged into a moderate hot-bed, observing to shade them until they have taken root; after which they must be treated as hath been directed for the seedling plants. These plants being ever-green, and growing in a pyramidal form, make a pretty variety in the stove, amongst other exotic plants.

BONUS HENRICUS. See Chenopodium.

BORBONIA. *Lin. Gen. Plant.* 764.

The Characters are,

The flower hath five leaves, and is of the butterfly shape. The standard is obtuse and reflexed, the wings are heart shaped and shorter than the standard; the keel hath two obtuse lunulated leaves. It hath nine stamina joined in a cylinder, and one upper standing single. In the center is situated a germen, which afterward becomes a round pointed pod terminated with a spine, having one cell inclosing a kidney-shaped seed.

The Species are,

1. *BORBONIA foliis lanceolatis multinerviis integerrimis. Lin. Sp. Plant. 707.* Borbonia with entire spear-shaped leaves having many nerves.

2. *BORBONIA foliis cordatis multinerviis integerrimis. Lin. Sp. Plant. 707.* Borbonia with entire heart-shaped leaves having many nerves.

3. *BORBONIA foliis lanceolatis trinerviis integerrimis. Lin. Sp. Pl. 707.* Borbonia with entire spear-shaped leaves having three veins.

The plants grow naturally at the *Cape of Good Hope*, where they rise to the height of ten or twelve feet; but in *Europe*, they are seldom more than four or five; having slender stems dividing into several branches, garnished with stiff leaves, placed alternately; those of the first sort are narrow, long, and end in a sharp point. The flowers come out from between the leaves at the end of the branches in small clusters, these are yellow, and shaped like those of the Broom.

The second sort hath broader leaves than the first; the stalks of this are slender, covered with white bark. The leaves embrace these at their base. The flowers are produced in small clusters at the end of the branches, which are the of same shape and colour as those of the former, but are larger.

The third sort hath stronger stalks than either of the former, which are garnished almost their whole length, as are also the branches with stiff spear-shaped leaves, having three longitudinal nerves in each. The flowers are produced at the extremity of the branches, each standing on a separate foot-stalk. They are of the same shape and colour with the former, but are larger.

As these plants do not perfect their seeds in this country, so they are with difficulty propagated here. The only method by which I have yet succeeded, hath been by laying down their young shoots; but these are commonly two years laid before they put out roots fit to be separated from the old plant. In laying these down, the joint which is laid in the ground should be slit upward, as is practised in laying Carnations, and the bark of the tongue at bottom taken off. The best time to lay these down is in the beginning of *September*, and the shoots most proper for this purpose, are those which come out immediately from the root, and of the same year's growth, not only from their situation being near the ground, and thereby better adapted for laying; but these are also more apt to put out roots, than any of the upper branches.

But where good seeds can be procured, that is the more eligible method of propagating the plants; for those raised from the seeds make the straightest plants, and are quicker of growth. When good seeds are obtained, they should be sown in pots as soon as they are received; which if it happens in the autumn, the pots should be plunged into an old bed of tanners bark, under a frame, where they may remain all the winter, being careful that they have not much wet; and in the spring, the pots should be plunged into a hot-bed, which will bring up the plants in five or six weeks. When these are fit to remove, they should be each planted into a separate small pot, and plunged into a moderate hot-bed, observing to shade them until they have taken fresh root. After this they must by degrees be inured to the open air, into which they should be removed in *June*, and placed in a sheltered situation; where they may remain till autumn, when they must be removed into the green-house, and placed where they may enjoy the air and sun; during the winter season, these plants must be sparingly watered; but in summer, when they are placed abroad, they will require to be frequently refreshed, but must not have too much water given them each time.

BORRAGO, Borage.

The Characters are,

The flower is of one leaf, having a short tube, and spread wide open above. The chaps of the flower are crowned by five prominences. It hath five stamina which are joined together. It hath four germen situated in the center, which after-ward becomes so many roundish rough seeds, inserted in the cavities of the receptacle.

The Species are,

1. *BORRAGO foliis omnibus alternis, calycibus patentibus. Hort. Upsal. 34.* Borage with all the leaves growing alternate, and a spreading flower cup.

2. *BORRAGO calycibus tubo corollæ brevioribus, foliis cordatis. Hort. Cliff. 45.* Borage of *Constantinople* with a blue reflexed flower, and a swelling flower cup.

3. *BORRAGO calycinis foliolis ovatis acutis erectis. Hort. Cliff. 45.* Borage with the leaves of the empalement oval, pointed and erect.

4. *BORRAGO foliis ramificationum oppositis calycinis foliolis sagittatis. Lin. Sp. Pl. 137.* Borage with opposite leaves on the branches, and spear-shaped leaves to the flower cup.

The first is the common Borage, whose flowers are used in medicine, and the herb for cool tankards in summer. Of this, there are three varieties which generally retain their difference from seeds; one hath a white, and another a red flower: the third hath variegated leaves.

This common Borage is an annual plant, which, if permitted to scatter its seeds, the plants will come up in plenty without care; or if the seeds are sown either in spring or autumn, on a spot of open ground where the plants are designed to remain, and the ground hoed, to destroy the weeds, and also to cut up the plants where they are too near each other; after this they will require no farther care, unless the weeds should come up again, then the ground should be a second time hoed over to destroy them, which if well performed, and in dry weather, will clear the ground from weeds, so it will require no more cleaning till the Borage is decayed.

The second sort grows near *Constantinople*. This is a perennial plant, with a thick fleshy root, which spreads under the surface of the ground, and is thereby propagated with great facility. It sends out many oblong heart-shaped leaves from the root, having long hairy foot-stalks; from the root arises the flower stem, which is more than two feet high when fully grown, having at the joints a single small leaf without a foot-stalk. The upper part of the stalk branches out into several small foot-stalks, which are terminated by loose panicles of flowers; these are of a pale blue colour, and the petal is reflexed backward, so that the connected stamina and style are left naked. It flowers in *March*, and the seeds ripen in *May*.

The third and fourth sorts grow naturally in *Africa*; these are both annual plants, which rarely rise a foot high, having rough stalks; those of the third sort are set on by pairs, with short foot-stalks, but the leaves of the fourth closely embrace the stalks at their base; the flowers come out on short foot-stalks from the wings of the leaves, and also at the top of the stalks. Those of the third sort are white, and those of the fourth a pale yellow, but neither of them make any great appearance, so are seldom cultivated, but in botanick gardens for variety.

If the seeds of these plants are sown in the autumn, in a warm border, the plants will live through the winter, and flower early the following summer, so will produce good seeds; for when they are sown in the spring, if the season is not very favourable, they do not perfect their seeds in *England*. The seeds should be sown where the plants are to remain, for they seldom succeed when they are transplanted.

BOSIA.

The Characters are,

The flower hath no petals, but five stamina which are as long as the empalement; in the center is situated an oval oblong pointed germen, which afterward becomes a globular berry with one cell including one pointed seed.

We have but one sort of this plant, viz.

BOSIA. *Lin. Hort. Cliff.* 84. Commonly called Golden-rod Tree.

This plant is a native of the islands of the *Canaries*; and it hath also been since found in some of the *British* islands in *America*: it was first brought into *England* from the *Canaries*, and has been long an inhabitant of the *English* gardens; but I have not as yet seen any of these plants in flower, though I have had many old plants under my care more than forty years: it makes a pretty strong woody shrub, growing with a stem as large as a middling person's leg; the branches come out very irregular, and make considerable shoots in summer, which should be shortened every spring. These branches retain their leaves till toward the spring, when they fall away, and new leaves are produced soon after: it may be propagated by cuttings planted in the spring, and the plants must be housed in the winter, being too tender to live through the winter, in the open air, in this country.

BOTRYS. See *Chenopodium*.

BOX-TREE. See *Buxus*.

BRABEJUM, *African Almond*, vulgò.

The Characters are,

The flower is composed of four narrow obtuse petals which are erect; it hath four slender stamina. In the center is a small hairy germen, which afterward becomes an oval, hairy, dry berry, inclosing an oval nut.

We have but one sort of this plant, viz.

BRABEJUM. *Hort. Cliff.* *African*, or *Ethiopian Almond*, with a silky fruit.

This tree is a native of the country about the *Cape of Good Hope*.

In *Europe* it seldom grows above eight or nine feet high, but in its native soil it is a tree of middling growth; as it is too tender to live through the winter in the open air, so we cannot expect to see it grow to a great size.

It rises with an upright stem, which is soft, and full of pith within, and covered with a brown bark. The leaves come out all round the branches at each joint, they are indented on their edges, standing on very short foot-stalks. The flowers are produced toward the end of their shoots, which are of a pale colour, inclining to white.

This plant is, with difficulty, propagated by layers, which are often two years before they make roots strong enough to be taken from the plants; when the branches are laid down, it will be a good method to slit them at a joint (as is practised in laying *Carnations*) which will promote their taking root.

The best time to make the layers is in *April*, just as the plants are beginning to shoot, and the layers must always be made of the former year's shoots. As this plant is very difficult to propagate, so it is very scarce in *Europe*, there being but few in the *Dutch* gardens at present.

The plants must have a good green-house in winter, but in summer should be set abroad in a sheltered situation, where, when they arrive to a proper age, they will thrive, and annually produce flowers in the spring, so will make a pretty variety among other exotick plants in the green-house.

BRANCA URSINA. See *Acanthus*.

BRASSICA, the Cabbage.

The Characters are,

The flower is cross-shaped, having four petals, and four oval

nectarious glands. It hath six stamina, which are erect, two of which are opposite, and the other four are longer. It hath a taper germen the length of the stamina, which afterward becomes a long taper pod, depressed on each side, and is terminated by the apex of the intermediate partition, which divides it into two cells, filled with round seeds.

I shall first enumerate the species, which are distinct, and afterward mention the varieties, which are cultivated for the table.

The Species are,

1. BRASSICA radice caulescente tereti carnosâ. *Hort. Cliff.* 338. The common white Cabbage.

2. BRASSICA radice caulescente orbiculari carnosâ, foliis sessilibus. Turnep-rooted Cabbage.

3. BRASSICA radice caulescente tereti carnosâ, floralibus multicaulis. The Cauliflower.

4. BRASSICA radice cauleque tenui ramofo perenni foliis alternis marginibus incis. Taller shrubby branching Sea Cabbage.

5. BRASSICA foliis lanceolato-ovatis glabris indivisis dentatis. *Hort. Upsal.* 191. Cabbage with entire oval spear-shaped smooth leaves, which are indented.

6. BRASSICA foliis oblongo cordatis amplexicaulibus, integerrimis. *Champaign* Colewort with a thorough wax leaf, and a purple flower.

7. BRASSICA foliis cordatis semiamplexicaulibus, marginibus dentatis, siliquis tetragonis longissimis. Eastern perfoliated Colewort with a white flower and a quadrangular pod.

8. BRASSICA radice caulescente tereti, foliis inferioribus petiolatis superioribus semiamplexicaulibus. The wild Navew, or Cole Seed.

The Varieties of the first sort are,

1. Brassica sabauda hyberna. *Lob. Icon.* The Savoy Cabbage, commonly called Savoy.

2. Brassica capitata rubra. *C. B. P.* 111. The red Cabbage.

3. Brassica capitata alba pyramidalis. The sugar loaf Cabbage.

4. Brassica capitata alba præcox. The early Cabbage.

5. Brassica peregrina moschum olens. *H. R. Par.* Foreign Musk Cabbage.

6. Brassica capitata alba minor Muscovitica. *H. A.* Small *Russia* Cabbage.

7. Brassica capitata alba compressa. *Boerb. Ind. Alt.* 11. The large sided Cabbage.

8. Brassica capitata viridis Sabauda. *Boerb. Ind.* 11. The green Savoy.

9. Brassica fimbriata. *C. B. P.* 111. The Borecole.

10. Brassica fimbriata virescens. *Boerb. Ind.* 2. 12. Green Borecole.

11. Brassica fimbriata Siberica. *Boerb. Ind.* 2. 12. *Siberian* Borecole, called by some *Scotch Kale*.

The Varieties of the third sort are,

1. Brassica Italica purpurea Broccoli dicta. *Juss.* Purple Broccoli.

2. Brassica Italica alba Broccoli dicta. *Juss.* White Broccoli.

The second sort, I believe, never varies, for I have cultivated it many years, and have not found it to alter. This grows naturally on the sea shore, near *Dover*. It hath a perennial branching stalk, in which it differs from all the other species. In very severe winters, when the other sorts are destroyed, this is a necessary plant, for the most severe frosts do not injure it. The flower-stalks grow from the end of the branches, and spread out horizontally; but those which arise from the center of the plants, grow erect, and seldom put out branches.

The two sorts of Broccoli I take to be only varieties of the Cauliflower, for although these may with care be kept distinct,

distinct, yet I doubt, if they were to stand near each other for seeds, if they would not intermix; and I am rather inclined to believe this, from the various changes which I have observed in all these sorts, for I have frequently had Cauliflowers of a green colour, with flower buds regularly formed at the ends of the shoots, as those of Broccoli, though the colour was different, and the white Broccoli approaches so near to the Cauliflower, as to be with difficulty distinguished from it; yet when these are cultivated with care, and never suffered to stand near each other, when left to produce seeds, they may be kept very distinct, in the same garden; for the variations of these plants is not occasioned from the soil, but the mixing of the farina of the flowers with each other, where they are planted near together; therefore those persons who are curious to preserve the several varieties distinct, should never suffer the different kinds to stand near each other for seed.

The Cauliflower has been much more improved in *England*, than in any other part of *Europe*. In *France* they rarely have Cauliflowers till *Michaelmas*; and *Holland* is generally supplied with them from *England*. In many parts of *Germany* there was none of them cultivated till within a few years past; and most parts of *Europe* are supplied with seeds from hence.

The eighth sort, which is generally known by the title of Rape or Cole Seed, is much cultivated in the isle of *Ely*, and some other parts of *England* for its seed, from which the Rape oil is drawn; and it hath also been cultivated of late years, in other places, for feeding of cattle, to great advantage.

The Cole Seed, when cultivated for feeding of cattle, should be sown about the middle of *June*. The ground for this should be prepared for it in the same manner as for Turneps. The quantity of seeds for an acre of land, is from six to eight pounds, and as the price of the seed is not great, so it is better to allow eight pounds; for if the plants are too close in any part, they may be easily thinned, when the ground is hoed, which must be performed in the same manner as is practised for Turneps, with this difference only, of leaving these much nearer together; for as they have fibrous roots, and slender stalks, so they do not require near so much room. These plants should have a second hoeing, about five or six weeks after the first, which, if well performed in dry weather, will entirely destroy the weeds, so they will require no farther culture. Where there is not an immediate want of food, these plants had better be kept as a reserve for hard weather, or spring seed, when there may be a scarcity of other green food. If the heads are cut off, and the stalks left in the ground, they will shoot again early in the spring, and produce a good second crop in *April*, which may be either fed off, or permitted to run to seeds, as is the practice, where this is cultivated for the seeds: but if the first is fed down, there should be care taken that the cattle do not destroy their stems, or pull them out of the ground. As this plant is so hardy, as not to be destroyed by frost, so it is of great service in hard winters for feeding of ewes; for when the ground is so hard frozen, as that Turneps cannot be taken up, these plants may be cut off, for a constant supply. This will afford late food after the Turneps are run to seed; and if it is afterward permitted to stand for seed, one acre will produce as much as, at a moderate computation, will sell for five pounds, clear of charges.

Partridges, pheasants, turkeys, and most other fowl, are very fond of this plant; so that wherever it is cultivated, if there are any birds in the neighbourhood, they will constantly lie among these plants.

The seeds of this plant are sown in gardens, for winter and spring sallets, this being one of the small sallet herbs.

The common white, red, flat, and long-sided Cabbages are chiefly cultivated for winter use: the seeds of these sorts must be sown the beginning or middle of *April*, in beds of good fresh earth; and when the young plants have about eight leaves, they should be pricked out into shady borders, about three or four inches square, that they may acquire strength, and to prevent their growing long shanked.

About the middle of *June*, you must transplant them out, where they are to remain for good (which in the kitchen gardens near *London*, is commonly between Cauliflowers, Artichokes, &c. at about two feet and an half distance in the rows); but if they are planted for a full crop in a clear spot of ground, the distance from row to row should be three feet and an half, and in the rows two feet and an half asunder: if the season should prove dry when they are transplanted out, you must water them every other evening, until they have taken fresh root; and afterwards, as the plants advance in height, you should draw the earth about their stems with a hoe, which will keep the earth moist about their roots, and greatly strengthen the plants.

These Cabbages will some of them be fit for use soon after *Michaelmas*, and will continue until the end of *February*, if they are not destroyed by bad weather; to prevent which, the gardeners near *London* pull up their Cabbages in *November*, and trench their ground up in ridges, laying their Cabbages against their ridges as close as possible on one side, burying their stems in the ground: in this manner they let them remain till after *Christmas*, when they cut them for the market; and although the outer part of the Cabbage be decayed (as is often the case in very wet or hard winters), yet, if the Cabbages were large and hard when laid, the inside will remain sound.

The *Russian* Cabbage was formerly in much greater esteem than at present, it being now only to be found in particular gentlemen's gardens, who cultivate it for their own use. This must be sown late in the spring of the year, and managed as those before directed, with this difference only, that these must be sooner planted out for good, and must have an open clear spot of ground, and require much less distance every way, for it is but a very small hard Cabbage. This sort will not continue long before they will break, and run up to seed.

The early and sugar loaf Cabbages are commonly sown for summer use, and are what the gardeners about *London* commonly call *Michaelmas* Cabbages. The season for sowing of these is about the end of *July*, or beginning of *August*, in an open spot of ground; and when the plants have got eight leaves, you must prick them into beds at about three or four inches distance every way, that the plants may grow strong and short shanked; and toward the end of *October*, you should plant them out for good: the distance that these require is, three feet row from row, and two feet and an half asunder in the rows. The ground must be kept clean from weeds, and the earth drawn up about your Cabbage plants.

In *May*, if your plants were of the early kind, they will turn in their leaves for cabbaging; at which time, the gardeners near *London*, in order to obtain them a little sooner, tie in their leaves close with a slender Osier-twig to blanch their middle; by which means, they have them at least a fortnight sooner than they could have if they were left untied.

The early Cabbage being the first, we should choose (if for a gentleman's use) to plant the fewer of them, and a greater quantity of the sugar-loaf kind, which comes after them; for the early kind will not supply the kitchen long, generally cabbaging apace when they begin, and as soon grow hard, and burst open; but the sugar-loaf kind is longer before it comes, and is as slow in its cabbaging; and being of an hollow kind, will continue good for a long time.

Although

Although I before have advised the planting out of Cabbages for good in *October*, yet the sugar-loaf kind may be planted out in *February*, and will succeed as well as if planted earlier, with this difference only, that they will be later before they cabbage. You should also reserve some plants of the early kind in some well-sheltered spot of ground, to supply your plantation, in case of a defect; for in mild winters many of the plants are apt to run to seed, especially when their seeds are sown too early, and in severe winters they are often destroyed.

The *Savoy* Cabbages are propagated for winter use, as being generally esteemed the better when pinched by the frost: these must be sown about the end of *April*, and treated after the manner as was directed for the common white Cabbage; with this difference, that these may be planted at a closer distance than those; two feet and an half square will be sufficient. These are always much better when planted in an open situation, which is clear from trees and hedges; for in close places they are very subject to be eaten almost up by caterpillars, and other vermin, especially if the autumn prove dry.

The Borecole may be also treated in the same manner, but need not be planted above one foot asunder in the rows, and the rows two feet distance: these are never eaten till the frost hath rendered them tender, for otherwise they are tough and bitter.

The seeds of the Broccoli, (of which there are several kinds, *viz.* the *Roman*, or purple, and the *Neapolitan*, or white, and the black Broccoli, with some others; but the *Roman* is chiefly preferred to them all) should be sown about the latter end of *May*, or beginning of *June*, and when the plants are grown to have eight leaves, transplant them into beds (as was directed for the common Cabbage); and toward the latter end of *July* they will be fit to plant out for good, which should be into some well sheltered spot of ground, but not under the drip of trees: the distance these require is about a foot and an half in the rows, and two feet row from row. The soil in which they should be planted, ought to be rather light than heavy, such as are the kitchen gardens near *London*: if your plants succeed well (as there will be little reason to doubt, unless the winter prove extreme hard), they will begin to shew their small heads, which are somewhat like a Cauliflower, but of a purple colour about the end of *December*, and will continue eatable till the middle of *April*.

The brown or black Broccoli is by many persons greatly esteemed, though it doth not deserve a place in the kitchen-garden, where the *Roman* Broccoli can be obtained, which is much sweeter, and will continue longer in season: indeed, the brown sort is much hardier, so that it will thrive in the coldest situations, where the *Roman* Broccoli is sometimes destroyed in very hard winters. The brown sort should be sown in the middle of *May*, and managed as hath been directed for the common Cabbage, and should be planted at the same distance, which is about two feet and an half asunder. This will grow very tall, so should have the earth drawn up to their stems as they advance in height. This doth not form heads so perfect as the *Roman* Broccoli; the stems and hearts of the plants are the parts which are eaten.

The *Roman* Broccoli (if well managed) will have large heads, which appear in the center of the plants, like clusters of buds. These heads should be cut before they run up to seed, with about four or five inches of the stem; the skin of these stems should be stripped off, before they are boiled. After the first heads are cut off, there will be a great number of side shoots produced from the stems, which will have small heads to them, but are full as well flavoured as the large.

The *Naples* Broccoli hath white heads, very like those of the Cauliflower, and eats so like it, as not be distinguished from it.

Besides this first crop of Broccoli (which is usually sown in the end of *May*), it will be proper to sow another crop the beginning of *July*, which will come in to supply the table the latter end of *March*, and the beginning of *April*; and being very young, will be extremely tender and sweet.

In order to save good seeds of this kind of Broccoli in *England*, you should reserve a few of the largest heads of the first crop, which should be let remain to run up to seed, and all the under shoots should be constantly stripped off, leaving only the main stem to flower and seed. If this be duly observed, and no other sort of Cabbage permitted to seed near them, the seeds will be as good as those procured from abroad, and the sort may be preserved in perfection many years.

The Turnep-rooted Cabbage was formerly more cultivated in *England*, than at present; for since other sorts have been introduced which are much better flavoured, this sort has been neglected. There are some persons who esteem this kind for soups; but it is generally too strong for most *English* palates, and is seldom good but in hard winters, which will render it tender, and less strong.

At the end of *June*, the plants should be transplanted out where they are to remain, allowing them two feet distance every way, observing to water them until they have taken root; and as their stems advance, the earth should be drawn up to them with a hoe, which will preserve a moisture about their roots, and prevent their stems from drying, and growing woody, so that the plants will grow more freely; but it should not be drawn very high, for as it is the globular part of the stalk which is eaten, so that should not be covered. In winter they will be fit for use, when they should be cut off, and the stalks pulled out of the ground, and thrown away, as being good for nothing after the stems are cut off.

The curled Colewort or *Siberian* Borecole is now more generally esteemed than the former. Being extreme hardy, so is never injured by cold, but is always sweeter in severe winters, than in mild seasons. This may be propagated by sowing of the seeds the beginning of *July*; and when the plants are strong enough for transplanting, they should be planted in rows about a foot and a half asunder, and ten inches distance in the rows. These will be fit for use after *Christmas*, and continue good until *April*, so that they are very useful in a family.

The Musk Cabbage. This may be propagated in the same manner as the common Cabbage, and should be allowed the same distance: it will be fit for use in *October*, *November*, and *December*; but, if the winter proves hard, these will be destroyed much sooner than the common sort.

The common Colewort or *Dorsetshire* Kale, is now almost lost near *London*, where their markets are usually supplied with Cabbage plants, instead of them. Indeed, where farmers sow Coleworts to feed their milch-cattle in the spring, when there is a scarcity of herbage, the common Colewort is to be preferred, as being so very hardy, that no frost will destroy it. The best method to cultivate this plant in the fields is, to sow the seeds about the beginning of *July*, choosing a moist season, which will bring up the plants in about ten days or a fortnight: the quantity of seed for an acre of land is nine pounds; when the plants have got five or six leaves, they should be hoed, as is practised for Turneps, cutting down all the weeds from amongst the plants, and also thinning the plants where they are too thick; but they should be kept thicker than Turneps, because they are more in danger of being destroyed by the fly: this work should

should be performed in dry weather, that the weeds may be killed. About six weeks after, the plants should have a second hoeing, which, if carefully performed in dry weather, will entirely destroy the weeds, and make the ground clean, so that they will require no farther culture: in the spring they may either be drawn up and carried out to feed the cattle, or they may be turned in to feed upon them as they stand; but the former method is to be preferred, because there will be little waste; whereas, when the cattle are turned in amongst the plants, they will tread down and destroy more than they eat, especially if they are not fenced off by hurdles.

The two last sorts of Cabbage are varieties fit for a botanick garden, but are plants of no use. They are annual plants, and perish when they have perfected their seeds.

The best method to save the seeds of all the best sorts of Cabbages is: about the end of *November* you should make choice of some of your best Cabbages, which you should pull up, and carry to some shed, or other covered place, where you should hang them up for three or four days by their stalks, that the water may drain from between their leaves; then plant them in some border, under a hedge or pale, quite down to the middle of the Cabbage, leaving only the upper part of the Cabbage above ground, observing to raise the earth about it, so that it may stand a little above the level of the ground; especially if the ground is wet, they will require to be raised pretty much above the surface.

If the winter should prove very hard, you must lay a little straw or Pease-haulm lightly upon them, to secure them from the frost; taking it off as often as the weather proves mild, lest by keeping them too close they should rot. In the spring of the year these Cabbages will shoot out strongly, and divide into a great number of small branches: you must therefore support their stems, to prevent their being broken off by the wind; and if the weather should be very hot and dry when they are in flower, you should refresh them with water once a week all over the branches, which will greatly promote their feeding, and preserve them from mildew.

When the pods begin to change brown, you will do well to cut off the extreme part of every shoot with the pods, which will strengthen your seeds; for it is generally observed, that those seeds which grow near the top of the shoots, are very subject to run to seed before they cabbage; so that by this there will be no loss, but a great advantage.

When your seeds begin to ripen, you must be particularly careful, that the birds do not destroy it, for they are very fond of these seeds. The best method I know to prevent this, is to get a quantity of birdlime, and dawb over a parcel of slender twigs, which should be fastened at each end to stronger sticks, and placed near the upper part of the seed, in different places, so that the birds may alight upon them, by which means they will be fastened thereto; where you must let them remain, if they cannot get off themselves: and although there should not above two or three birds be caught, yet it will sufficiently terrify the rest, that they will not come to that place again for a considerable time after, as I have experienced.

When your seeds are fully ripe, you must cut it off; and, after drying, thresh it out, and preserve it in bags for use.

But in planting of Cabbages for seed, I would advise never to plant more than one sort in a place, or near one another: as for example, never plant red and white Cabbages near each other, nor Savoy with white or red Cabbages; for I am very certain they will, by the commixture of their effluvia, produce a mixture of kinds; and it is wholly owing to this neglect, that the gardeners rarely save any good red

Cabbage seed in *England*, but are obliged to procure fresh seeds from abroad, as supposing the soil or climate of *England* alters them from red to white, and of a mixed kind between both; whereas, if they would plant red Cabbages by themselves for seeds, and not suffer any other to be near them, they might continue the kind as good in *England*, as in any other part of the world.

Cauliflowers have of late years been so far improved in *England*, as to exceed in goodness and magnitude what are produced in most parts of *Europe*, and by the skill of the gardener, are continued for several months together; but the most common season for the great crop, is in *May*, *June*, and *July*. I shall therefore begin with directions for obtaining them in this season.

Having procured a parcel of good seed, you must sow it about the twenty-first of *August*, upon an old Cucumber or Melon bed, sifting a little earth over the seeds, about a quarter of an inch thick; and if the weather should prove extreme hot and dry, you should shade the bed with mats, to prevent the earth from drying too fast, and give it gentle waterings, as you may see occasion. In about a month's time after sowing, your plants will be fit to prick out; you should therefore put some fresh earth upon your Cucumber or Melon beds, or where these are not to be had, some beds should be made with a little new dung, which should be trodden down close, to prevent the worms from getting through it; but it should not be hot dung, which would be hurtful to the plants at this season, especially if it proves hot; into this bed you should prick your young plants, at about two inches square, observing to shade and water them at first planting; but do not water them too much after they are growing, nor suffer them to receive too much rain, if the season should prove wet, which would be apt to make them black shanked (as the gardeners term it, which is no less than a rottenness in their stems), and is the destruction of the plants so affected.

In this bed they should continue till about the thirtieth of *October*, when they must be removed into the place where they are to remain during the winter season, which, for the first sowing, is commonly under bell or hand glasses, to have early Cauliflowers, and these should be of an early kind; but in order to have a succession during the season, you should be provided with another more late kind, which should be sown four or five days after the other, and managed as was directed for them.

In order to have very early Cauliflowers, you should make choice of a good rich spot of ground, that is well defended from the north, east, and west winds, with hedges, pales, or walls; but the first is to be preferred, if made with reeds, because the winds will fall dead in these, and not reverberate as by pales, or walls. This ground should be well trenched, burying therein a good quantity of rotten dung; then level your ground; and if it be naturally a wet soil, you should raise it up in beds about two feet and a half, or three feet broad, and four inches above the level of the ground: but if your ground is moderately dry, you need not raise it at all: then plant your plants, allowing about two feet six inches distance from glass to glass, in the rows, always putting two good plants under each glass, which may be at about four inches from each other; and if you design them for a full crop, they may be three feet and a half, row from row: but if you intend to make ridges for Cucumbers between the rows of Cauliflower plants (as is generally practised by the gardeners near *London*), you must then make your rows eight feet asunder.

When you have planted your plants, if the ground is very dry, you should give them a little water, and then set your glasses over them, which may remain close down over them, until they have taken root, which will be in about a week

week or ten days time, unless there should be a kindly shower of rain; in which case you may set off the glasses, that the plants may receive the benefit of it; and in about ten days after planting, you should be provided with a parcel of forked sticks or bricks, with which you should raise your glasses about three or four inches on the side toward the south, that your plants may have free air: in this manner your glasses should remain over the plants, night and day, unless in frosty weather, when you should set them down as close as possible: or if the weather should prove very warm, which many times happens in *November*, and sometimes in *December*; in this case, you should keep your glasses off in the day time, and put them on only in the night, lest, by keeping the glasses over them too much, you should draw them into flower at that season; which is many times the case in mild winters, especially if unskilfully managed.

Toward the latter end of *February*, if the weather proves mild, you should prepare another good spot of ground, to remove some of the plants into, from under the glasses, which should be well dunged and trenched (as before); then set off your glasses, and, after making choice of one of the most promising plants under each glass, which should remain for good, take away the other plant, by raising it up with a trowel, &c. so as to preserve as much earth to the root as possible; but have a great regard to the plant that is to remain, not to disturb or prejudice its roots: then plant the plants which you have taken out, at the distance before directed, *viz.* If for a full crop, three feet and an half, row from row; but if for ridges of Cucumbers between them, eight feet, and two feet four inches distance in the rows: then, with a small hoe, draw the earth up to the stems of the plants which were left under the glasses, taking great care not to let the earth fall into their hearts; and set your glasses over them again, raising your props an inch or two higher than before, to give them more air, observing to take them off whenever there may be some gentle showers, which will greatly refresh the plants.

In a little time after, if you find your plants grow so fast as to fill the glasses with their leaves, you should then slightly dig about the plants, and raise the ground about them in a bed broad enough for the glasses to stand, about four inches high, which will give your plants a great deal of room by raising the glasses so much higher, when they are set over them; and by this means they may be kept covered until *April*, which otherwise they could not, without prejudice to the leaves of the plants: and this is a great advantage to them; for many times we have returns of severe frosts at the latter end of *March*, which prove very hurtful to these plants, if exposed thereto, especially after having been nursed up under glasses.

After you have finished your beds, you may set your glasses over your plants again, observing to raise your props pretty high, especially if the weather be mild, that they may have free air to strengthen them; and in mild soft weather set off your glasses, as also in gentle showers of rain: and now you must begin to harden them by degrees to endure the open air; however, it is advisable to let your glasses remain over them as long as possible, if the nights should be frosty, which will greatly forward your plants: but be sure do not let your glasses remain upon them in very hot sun-shine, especially if their leaves press against the sides of the glasses; for I have often observed, in such cases, that the moisture which hath risen from the ground, together with the perspiration of the plants, which, by the glasses remaining over them, hath been detained upon the leaves of the plants, and when the sun hath shone hot upon the sides of the glasses, hath acquired such a powerful heat from the beams thereof, as to scald all their larger leaves, to the no small prejudice of the plants: nay, sometimes I have

seen large quantities of plants so affected therewith, as never to be worth any thing after.

If your plants have succeeded well, toward the end of *April* some of them will begin to fruit: you must therefore look over them carefully every other day, and when you see the flower plainly appear, you must break down some of the inner leaves over it to guard it from the sun, which would make the flower yellow and unsightly, if exposed thereto; and when you find your flower at its full bigness (which you may know by its outside parting, as if it would run), you must then draw it out of the ground, and not cut them off, leaving the stalk in the ground, as is by some practised; and if they are designed for present use, you may cut them out of their leaves; but if designed to keep, you should preserve their leaves about them, and put them into a cool place: the best time for pulling of them is in a morning, before the sun hath exhales the moisture; for Cauliflowers, pulled in the heat of the day, lose that firmness which they naturally have, and become tough.

But to return to our second crop (the plants being raised and managed as was directed for the early crop, until the end of *October*); you must then prepare some beds, either to be covered with glass frames, or arched over with hoops, to be covered with mats, &c. These beds should have some dung laid at the bottom, about six inches or a foot thick, according to the size of your plants; for if they are small, the bed should be thicker of dung, to bring them forward, and so *vice versa*: this dung should be beat down close with a fork, in order to prevent the worms from finding their way through it; then lay some good fresh earth about four or five inches thick thereon, in which you should plant your plants about two inches and an half square, observing to shade and water them until they have taken new root; but be sure do not keep your coverings close, for the warmth of the dung will occasion a large damp in the bed, which, if pent in, will greatly injure the plants.

When your plants have taken root, you must give them as much free open air as possible; by keeping the glasses off in the day-time, as much as the weather will permit; and in the night, or at such times as the glasses require to be kept on, raise them up with props to let in fresh air, unless in frosty weather; at which time the glasses should be covered with mats, straw, or Pease-haulm, &c. but this is not to be done but in very hard frosts: you must also observe to guard them against great rain, which in winter time is very hurtful to them, but in mild weather, if the glasses are kept on, they should be propped to admit fresh air; and if the under leaves grow yellow and decay, be sure to pick them off; for if the weather should prove very bad in winter, so that you should be obliged to keep them close covered for two or three days together, as it sometimes happens, these decayed leaves will render the inclosed air very noxious; and the plants, perspiring pretty much at that time, are often destroyed in vast quantities.

In the beginning of *February*, if the weather be mild, you must begin to harden your plants by degrees, that they may be prepared for transplantation; the ground where you intend to plant your Cauliflowers out for good (which should be quite open from trees, &c. and rather moist than dry), having been well dunged and dug, should be sown with Radishes a week or fortnight before you intend to plant out your Cauliflowers: the reason why I mention the sowing of Radishes particularly, is this; *viz.* that if there are not some Radishes amongst them, and the month of *May* should prove hot and dry, as it sometimes happens, the fly will seize your Cauliflowers, and eat their leaves full of holes, to their prejudice, and sometimes their destruction; whereas, if there are Radishes upon the spot, the flies will take to them, and never meddle with the Cauliflowers so long;

long as they last: indeed, the gardeners near *London* mix Spinage with their Radish seed, and so have a double crop; which is an advantage where ground is dear, or where persons are streightened for room; otherwise it is very well to have only one crop amongst the Cauliflowers, that the ground may be cleared in time.

Your ground being ready, and the season good, about the middle of *February*, you may begin to plant out your Cauliflowers: the distance which is generally allowed by the gardeners near *London* (who plant other crops between their Cauliflowers to succeed them, as Cucumbers for pickling, and winter Cabbages) is every other row four feet and an half apart, and the intermediate rows two feet and an half, and two feet two inches distance in the rows; so that in the latter end of *May*, or beginning of *June* (when the Radishes and Spinage are cleared off), they put in seeds of Cucumbers for pickling, in the middle of the wide rows, at three feet and an half apart; and in the narrow rows, plant Cabbages for winter use, at two feet two inches distance, so that these stand each of them exactly in the middle of the square between four Cauliflower plants; and these, after the Cauliflowers are gone off, will have full room to grow, and the crop be hereby continued in a succession through the whole season.

There are many people, who are very fond of watering Cauliflower plants in summer; but the gardeners near *London* have almost wholly laid aside this practice, as finding a deal of trouble and charge to little purpose; for if the ground be so very dry as not to produce tolerable good Cauliflowers without water, it seldom happens, that watering of them renders them much better; and when once they have been watered, if it is not constantly continued, it had been much better for them if they never had any; as also, if it be given them in the middle of the day, it rather helps to scald them: so that, upon the whole, if care be taken to keep the earth drawn up to their stems, and clear them from every thing that grows near them, that they may have free open air, you will find that they will succeed better without than with water, where any of these cautions are not strictly observed.

But in order to have a third crop of Cauliflowers, you should make a slender hot-bed in *February*, in which you should sow the seeds, covering them a quarter of an inch thick with light mould, and covering the bed with glass frames. When the plants are come up, and have gotten four or five leaves, you should prepare another hot-bed to prick them into, which may be about two inches square; and in the beginning of *April* harden them by degrees, to fit them for transplanting, which should be done the middle of that month, at the distance directed for the second crop, and must be managed accordingly: these (if the soil is moist where they are planted, or the season cool and moist) will produce good Cauliflowers about a month after the second crop is gone, whereby their season will be greatly prolonged.

There is also a fourth crop of Cauliflowers, which is raised by sowing the seed about the twenty-third of *May*; and being transplanted, as hath been before directed, will produce good Cauliflowers in a kindly season, and good soil, after *Michaelmas*, and continue through *October* and *November*, and, if the season permit, often a great part of *December*.

The reason why I fix particular days for the sowing of this seed, is because two or three days often make a great difference in their plants; and because these are the days usually fixed by the gardeners near *London*, who have found their crops to succeed best when sown at those times, although one day, more or less, will make no great odds. I have also, in this edition, altered the days to the new style.

BREYNIA. *Plum. N. Gen.* 40. *Lin. Gen.* 566.

The Characters are,

The flower hath four oval petals, which are a little longer than the empalement. It hath a great number of slender stamina. In the center is situated a slender oblong obtuse germen, which afterward becomes a long soft fleshy pod opening in two valves, with one cell, inclosing a row of fleshy kidney-shaped seeds.

The Species are,

1. BREYNIA *foliis oblongo-ovalibus*. *Prod. Leyd.* 476. Breynia with oblong oval leaves.

2. BREYNIA *foliis lanceolatis serratis, petiolatis*. Breynia with sawed spear-shaped leaves, which have long foot-stalks.

The first sort grows naturally in most of the sugar islands in *America*.

This, in the countries where it naturally grows, rises with an upright stem, to the height of twenty-five or thirty feet, dividing into many branches at the top, which are covered with an Ash-coloured bark, and closely garnished with oblong leaves, ending in a point; which are of the consistence with those of the Bay tree, white on their under side, but of an Olive colour on their upper side, and are very smooth and shining.

The flowers are produced in loose panicles at the extremity of the branches, each standing on a separate foot-stalk. In the center arises the long germen, attended by a great number of slender purple stamina, which are stretched out a great length beyond the petals. After the flowers decay, the germen becomes a long, cylindrical, fleshy pod, containing three or four seeds; situated at a distance; where each seed is lodged, the pod has a large swelling, but is contracted between them.

The second sort grows at *Campeachy*. This grows to a larger size than the former, and sends out many lateral branches at the top, which are garnished with oblong serrated leaves, standing on pretty long foot-stalks; these are of a much thinner consistence than those of the other sort, and are green on both sides. As this sort hath not as yet flowered in *England*, so I can give no account of their shape or colour.

These plants are both very impatient of cold; therefore must be preserved in stoves, otherwise they will not live through the winter in this climate. They may be propagated by seeds, which should be sown on a hot-bed early in the spring, and when the plants are come up two inches high, they should be carefully transplanted, each into a separate small pot, and then plunged into a moderate hot-bed of tanners bark, observing to water and shade them until they have taken new root. If the plants have thriven so well as to fill the pots with their roots by the middle of *August*, they may be then shaken out carefully, so as to preserve the earth to their roots; and after trimming the fibres on the outside of the ball of earth, they should be put into pots of a size larger, then plunge them again into the hot-bed, to promote their taking good root before the autumn is cold. In this bed they may remain until the end of *September*, when they must be placed in the bark stove, where, during the winter season, they should be kept in a temperate heat, and must be often refreshed with water; but it must not be given them in large quantities at this season.

BROMELIA. *Plum. Nov. Gen.* 46. *Tab.* 8. *Lin. Gen. Plant.* 356.

The Characters are,

The flower hath three long narrow petals, each having a nectarium joined to it above the base: it hath six stamina. The germen is situated below the receptacle, which afterward becomes an oblong capsule, divided by a partition in the middle, to which the seeds are fixed quite round; these are smooth and almost cylindrical.

Dr. Dillenius has supposed this to be same with Plumier's Karatas, which mistake he was led into by Plumier's Drawings, where the flower of his Caraguata is joined to the fruit of his Karatas, and *vice versa*.

The Species are,

1. BROMELIA *foliis radicalibus dentato-spinosis caulinis integerrimis*. Lin. Sp. Pl. 286. Bromelia with lower leaves indented, and prickly, and those of the stalks entire.

2. BROMELIA *foliis serrato-spinosis obtusis, spicis alternis*. Lin. Sp. Plant. 285. Bromelia with sawed prickly leaves, which are obtuse, and spikes of flowers growing alternate.

The first sort hath leaves very like some of the sorts of Aloes, but not so thick and succulent, which are sharply indented on their edges, where they are armed with strong black spines; from the center of the plant arises the flower stalk, which is near three feet high, the lower part of which is garnished with entire leaves, placed alternately at every joint. The upper part of the stalk is garnished with flowers, set in a loose spike, or thyse, quite round; these have three narrow herbaceous petals, fitting upon the germen, and within are six slender stamina, with the style, which are shorter than the petals. These are succeeded by oval seed-vessels, having a longitudinal partition, in the center of which are fastened cylindrical seeds on every side, which are smooth.

The second sort hath shorter leaves than the first, which are narrow at the base, increasing in width gradually to the top, where they are broadest; they are sharply sawed on their edges, and are of a deep green colour. The flower stem arises from the center of the plant, which divides upward into several branches; the upper part of these are garnished with spikes of flowers, which come out alternately from the side of the branches, each having a narrow entire leaf just below it, which is longer than the spike. The flowers are placed very close on the spikes, each having three short petals, situated upon the globular empalement; when these decay, the empalement turns to an oval pointed seed-vessel, inclosing seeds of the same shape with the former.

Both these plants grow naturally in very warm countries. The first sort grows also on the coast of Guinea.

These plants are propagated by seeds, which must be sown in small pots, and plunged into a moderate hot-bed of tanners bark. If the seeds are good, the plants will appear in about five or six weeks, and in a month or six weeks after will be fit to transplant, when they should be carefully shaken out of the pots, and each planted in a separate small pot; then they must be plunged again into a moderate hot-bed, observing frequently to sprinkle them over with water, but be cautious of giving them too much, lest the roots should be thereby rotted. During the summer season the plants should have a moderate share of air, in proportion to the heat of the weather; and, in autumn they must be removed into the bark stove, and treated in the same manner as the Ananas, or Pine Apple, with which management they will make good progress.

These plants make a pretty variety in the hot house, so those who have room, may allow a plant or two of each sort to have a place in their collection of exotic plants.

BROOM, the common. See Spartium.

BROOM, the Spanish. See Spartium and Genista.

BROWALLIA. Lin. Gen. Pl. 691. Hort. Cliff.

The Characters are,

The flower is funnel-shaped, of one leaf, having a cylindrical tube, twice the length of the empalement; the upper part is spread open, and divided into five parts. It hath four stamina included in the chaps of the petal, the two upper being very short, and the two under broad, and longer. In the center is situated an oval germen. The empalement afterward becomes an oval obtuse vessel

with one cell, opening at the top in four parts, and filled with small compressed seeds.

We have but one Species of this genus, viz.

BROWALLIA. Hort. Cliff. 138. This is the Dalea. Hort. Cbell. Ind. 67. We have no English name for this plant.

The seeds of this plant, were sent me by Mr. Robert Millar, from Panama, in the year 1735. The plants are annual, so perish in autumn; the seeds must be sown upon a hot bed in the spring, and the plants brought forward on another, otherwise they will not perfect their seeds in England. Some of these plants may be transplanted in June, into the borders of the flower garden, where, if the season proves warm, they will flower and perfect seeds; but lest these should fail, there should be a plant or two kept in the stove. They usually grow about two feet high, and spread out into lateral branches on every side the stalk, garnished with oval leaves which are entire, and have short foot-stalks. Toward the end of the branches the flowers are produced singly, upon pretty long foot-stalks, arising from the wing of the leaf. These have a short empalement of one leaf, which is cut into five parts; out of the center of the empalement the flower arises, which is crooked and bent downward; the top of the tube is spread open, and the brim, or open part of the flower, has some resemblance to a lip flower, being irregular; it is of a light blue colour, sometimes inclining to a purple or red, and often there are flowers of three colours on the same plant. When these fail away, the germen in the center becomes an oval capsule of one cell, filled with small brown angular seeds. It flowers in July, August, and September, and the seeds are ripe in five or six weeks after.

BRUNELLA, Self-heal. See Prunella.

BRUNSFELSIA. Plum. Nov. Gen. 12. Lin. Gen. Pl. 230.

The Characters are,

The flower is of one leaf, and funnel-shaped, having a long tube, but spreads open at the top; it hath five stamina the length of the tube, which are inserted in the petal. In the center is placed a small round germen. The empalement afterward becomes a globular berry with one cell, inclosing a great number of small seeds, which adhere to the skin of the fruit.

We know but one Species of this genus, viz.

BRUNSFELSIA. Lin. Sp. Pl. 191. Brunfelsia with a white flower, and a soft Saffron coloured fruit.

This plant rises with a woody stem, to the height of eight or ten feet, sending out many side branches, which are covered with a rough bark, and are garnished with oblong oval leaves. At the extremity of the branches, the flowers are produced, generally three or four together. These are almost as large as those of the greater Bindweed, but have very long narrow tubes, which are hairy. After the flower is past, the empalement turns to a round soft fruit, inclosing many oval seeds, which are situated close to the cover or skin, to which they adhere.

This plant grows naturally in most of the sugar islands in America, but in the English gardens, it is at present very rare; it may be propagated from seeds, which should be sown early in the spring in pots, and plunged into a hot-bed of tanners bark. When the plants are come up, they should be transplanted each in a separate small pot, and plunged into the hot-bed again, observing to water and shade the plants until they have taken root. When the plants have advanced so high as not to be contained in the frames, they should be removed into the bark stove, where, during the summer months, they should have a large share of free air, but in the winter they must be kept very close. These plants may also be increased by planting their cuttings in the spring, before they shoot, in pots filled with fresh light earth, and plunged into a hot-bed of tanners bark.

BRUSCUS. See Ruscus.

BRYONIA, Bryony.

The Characters are,

It hath male and female flowers on the same plant. The male flowers are bell shaped, adhering to the empalment, and cut into five segments. They have three short stamina. The female flowers sit upon the germen; the petal is the same with those of the male. The germen, which is under the flower, afterward becomes a smooth globular berry, containing oval seeds adhering to the skin.

The Species are,

1. BRYONIA foliis palmatis utrinque calloso scabris. Hort. Cliff. 453. Rough or white Bryony with red berries.

2. BRYONIA foliis palmatis quinquepartitis utrinque lævibus, laciniis pinnatifidis. Lin. Sp. Plant. 1013. African tuberous rooted Bryony, with indented leaves and an herbaceous flower.

3. BRYONIA foliis palmatis supra calloso-punctatis. Hort. Cliff. 453. Spotted Bryony of Crete.

4. BRYONIA foliis trilobis supra calloso punctatis, fructu racemoso ovali. Bryony with a red Olive-shaped fruit.

5. BRYONIA foliis palmatis, laciniis lanceolatis, supra punctatis infernè lævibus, fructu ovato sparsis. American Bryony with a variegated fruit.

6. BRYONIA foliis palmatis quinquepartitis hirsutis, laciniis obtusis. Bryony with hairy palmated leaves divided into five parts, and obtuse segments.

The first sort grows upon dry banks, under hedges, in many parts of *England*. The roots of this plant have been formerly, by impostors, brought into a human shape, and carried about the country, and shewn for Mandrakes to the common people, who were easily imposed on by their credulity, and these got good livings thereby. The method which these people practised, was to find a young thriving Bryony plant, then they opened the earth all round the plant, being careful not to disturb the lower fibres; and (being prepared with such a mould, as is used by the people who make plaster figures) they fixed the mould close to the root, fastening it with wire, to keep it in its proper situation; then they filled the earth about the root, leaving it to grow to the shape of the mould, which in one summer it will do; so that if this be done in *March*, by *September* it will have the shape. The leaves of this plant are also often imposed on the people in the market for Mandrake leaves, although there is no resemblance between them, nor any agreement in quality.

The second and fourth sorts are perennial plants, but their branches decay every winter. These roots must be planted in pots filled with fresh light earth, and in winter must be placed in the green-house, to protect them from frost, and great rains; which would destroy them, if they were exposed thereto. In summer, they may be exposed to the open air, and must be frequently refreshed with water in dry weather. These plants will flower in *July*, and in warm summers will perfect their seeds.

The third, fifth, and sixth sorts, are annual plants; these must be raised on a hot-bed early in the spring, and when the plants are about three inches high, they should be each transplanted into a small pot, and plunged into a hot-bed of tanners bark. When the plants are grown so large, as to ramble about on the surface of the bed, and begin to entangle with other plants, they should be shifted into larger pots, and placed in the bark stove, where their branches may be trained to the wall, or against an espalier, that they may have sun and air, which is absolutely necessary for their producing fruit. When these plants are full of fruit, they make a pretty variety in the stove amongst other exotick plants.

BRYONIA NIGRA. See Tamnus.

BUBON. Lin. Gen. Plant. 312. Macedonian Parsley.

The Characters are,

It hath an umbelliferous flower; the small umbels have twenty rays. The empalment of the flower is permanent; the flower is composed of five spear-shaped petals, which turn inward; it hath five stamina. The oval germen is situated below the flower, which afterward becomes an oval channelled hairy fruit, dividing in two parts, each having an oval seed, plain on one side, but convex on the other.

The Species are,

1. BUBON foliolis rhombeo ovatis crenatis, umbellis numerosissimis. Hort. Cliff. 95. Macedonian Parsley.

2. BUBON foliolis linearibus. Hort. Cliff. 95. Hard or rigid Ferula, with very short leaves.

3. BUBON foliolis rhombeis serratis glabris, umbellis paucis. Hort. Cliff. 96. African Ferula bearing Galbanum, with a leaf and appearance of Lovage.

4. BUBON foliolis glabris inferioribus rhombeis serratis, superioribus pinnatifidis tridentatis. Prod. Leyd. 100. Galbanum-bearing African Ferula, with the Mock Chervil leaf.

The first sends out many leaves from the root, the lower growing almost horizontally, spreading near the surface of the ground, which are garnished with smooth rhomb-shaped leaves, which are of a bright pale green colour, and sawed on their edges. In the center of the plant arises the flower stem, which is little more than a foot high, dividing into many branches, each being terminated by an umbel of white flowers, which are succeeded by oblong hairy seeds.

This plant in warm countries is biennial, the plants which rise from seeds one year, produce flowers and seeds the next, and then perish: but in *England*, they seldom flower till the third or fourth year from seed; but whenever the plant flowers, it always dies.

It is propagated by seeds, which should be sown on a bed of light sandy earth in *April*. When the plants come up, they will require no other care but to be kept clean from weeds, till the beginning of *October*, when they should be carefully taken up, and planted in a warm border of dry ground; and a few of them should be put into pots, that they may be sheltered under a frame in winter; for in severe frost, those which are exposed to the open air, are frequently killed; though, in moderate winters, they will live abroad without covering. The seeds of this plant is one of the ingredients in *Venice* treacle.

The second sort grows naturally in *Sicily*. This is a low perennial plant, having short stiff leaves, which are very narrow: the flower stalk rises near a foot high, which is terminated by an umbel of small white flowers, which are succeeded by small oblong channelled seeds. It is propagated by seeds, and should have a dry soil and a warm situation, where the plants will continue several years. It is a plant of little beauty or use, so is only preserved for the sake of variety.

The third sort rises with an upright stalk, to the height of eight or ten feet, which at bottom is woody, having a purplish bark, covered with a whitish powder, which comes off when handled; the upper part of the stalk is garnished with leaves at every joint, the foot-stalks half embracing them at their base, and are set with leaves like those of Lovage, but smaller, and of a gray colour; the top of the stalk is terminated by an umbel of yellow flowers, which are succeeded by oblong channelled seeds, which have a thin membrane or wing on their border. When any part of the plant is broken, there issues out a little thin milk of a cream colour, which hath a strong scent of Galbanum.

The fourth sort, like the third, rises with a lignous stalk, about the same height, and is garnished with leaves at each joint, which branch-out like the former; but the small leaves or lobes are narrow and indented, like those of Ballard Hemlock. The stalk is terminated by an umbel of small yellow

yellow flowers, which are succeeded by seeds like of those of the former sort.

They are propagated by seeds, which should be sown in pots filled with light loamy earth, as soon as they arrive; which, if it happens toward autumn, should be plunged into an old bed of tanners bark, where the heat is gone, and screened from frost in winter. In the spring the plants will come up, and by the middle of *April* will be fit to remove, when they should be carefully shaken out of the pots, and planted each into separate small pots: then plunge the pots into the tan again, and water them to settle the earth to the roots of the plants, and shade them from the sun in the day time, until they have taken new root; after this they must be inured gradually to bear the open air, into which they should be removed in *June*, and placed with other exotick plants in a sheltered situation, where they may remain till autumn, when they must be removed into the green-house, and placed where they may enjoy as much of the sun and air as possible, but defended from frost.

These plants make a pretty variety in the green-house in winter, and when they are placed abroad in the summer with other green-house plants, they have a good effect, especially when they are grown to a large size. In warm summers, the plants will perfect their seeds in *England*, if they stand in a warm sheltered situation.

The Galbanum of the shops is supposed to be procured from both these sorts indifferently; and upon breaking of their leaves, the juice which flows out from the wound, hath a strong odour of the Galbanum, which is a confirmation of it.

BUCKSHORN, or HARTSHORN. See Plantago.

BUDDING. See Inoculating.

BUDDLEJA. *Houft. Mss. Lin. Gen. Plant.* 131.

The Characters are,

The flower is of one leaf, bell-shaped, and quadrifid; it hath four short stamina, which are placed at the divisions of the petal. The oblong germen is situated in the center, which afterward becomes an oblong capsule, having two cells filled with small seeds.

The Species are,

1. BUDDLEJA *foliis ovatis serratis oppositis subtus pilosis, floribus spicatis racemosis, caule fruticoso*. Shrubby Buddleja with leaves growing by pairs, sawed at their edges, and yellow flowers growing in spikes.

2. BUDDLEJA *foliis lanceolatis acuminatis integerrimis oppositis, spicis interruptis, caule fruticoso ramoso*. Buddleja with pointed spear-shaped leaves which are entire, and placed opposite, divided spikes, and a branching shrubby stalk.

The first sort grows naturally in *Jamaica*, and most of the other islands in *America*, where it rises to the height of ten or twelve feet, with a thick woody stem, covered with a gray bark; and sends out many branches toward the top, which come out opposite; as are also the leaves so placed, which are oval, and covered on their under side with a brown hairy down. At the end of the branches the flowers are produced in long close spikes, branching out in clusters, which are yellow, consisting of one leaf, cut into four segments; these are succeeded by oblong capsules, filled with small seeds.

The second sort grows at *Carthagena*. This rises much taller than the first, and divides into a great number of slender branches, which are covered with a russet hairy bark, garnished with long spear-shaped leaves, ending in sharp points: at the end of the branches are produced branching spikes of white flowers, growing in whorls round the stalks, with small spaces between each. The leaves of this are much thinner than those of the first sort, and have scarce any down on their under side; the spikes of flowers grow more erect, so form a large loose spike at the end of every branch.

These plants grow naturally in gullies or other low sheltered spots, in the *West-Indies*, their branches being too

tender to resist the force of strong winds, so are rarely seen in open situations.

They are propagated by seeds, which should be brought over in their capsules or pods, for those which are taken out before they are sent seldom grow. They should be sown in pots, and very lightly covered; for as the seeds are very small, so if they are buried deep in the ground, they will perish. The pots should be plunged into a moderate hot-bed. If the seeds are fresh and good, the plants will come up in about six weeks; and if they grow kindly, will be large enough to transplant in about a month after. Then they should be carefully separated, and each planted into a separate small pot, and plunged into the hot-bed again, observing to shade them from the sun until they have taken new root. After the plants have taken fresh root in the pots, there should be fresh air admitted to them every day, in proportion to the warmth of the season; they must also be frequently, but moderately, refreshed with water. When the plants have filled these small pots with their roots, it will be proper to shift them into pots one size larger, that they may have time to take good root again, before the cold weather comes on. When these are new potted, the tan should be turned over, to renew the heat, and if it is wanted, some fresh tan must be added to the bed, to encourage the roots of the plants. In this bed they may remain till autumn, when they must be removed into the stove, and plunged into the tan bed; where they must constantly remain, for they are too tender to thrive in this country, if they are not so treated. During the winter they must have but little water, and should be kept warm; but in summer they should have fresh air admitted to them constantly when the weather is warm, and frequently sprinkled all over with water. With this management, the plants will flower the fourth year from seeds, and continue so to do every year after, and will make a good appearance in the stove.

BUGLOSSUM. See Anchusa, and Lycopsis.

BUGULA. *Tourn. Inst. R. H.* 208. *Tab.* 98. Bugle.

The Characters are,

The flower is of one leaf, of the lip kind, having an incurved cylindrical tube; the upper lip is very small; erect, and bifid; the under lip is large, open, and divided into three segments; it hath four erect stamina, two of which are longer than the upper lip, and two shorter. In the center is situated the four germen, which afterward become four naked seeds inclosed in the empalement.

The Species are,

1. BUGULA *foliis caulinis semiamplexicaulibus, stolonibus reptatricibus*. Common Bugle.

2. BUGULA *foliis oblongo-ovatis, caulibus decumbentibus, verticillis distantibus*. Bugle with a large leaf, and pale blue flower.

3. BUGULA *foliis obtuso dentatis, caule simplici*. Bugle with blunt indented leaves, and a single stalk.

4. BUGULA *foliis oblongis tomentosis, calycibus hirsutis*. Bugle with a flesh coloured flower.

5. BUGULA *villosa, foliis ovato-dentatis sessilibus, floribus resupinatis*. Hairy Eastern Bugle with an inverted white flower having a purple rim.

The first sort grows naturally in woods, and shady moist places, in most parts of *England*. There are two varieties of this, one with a white, and the other a pale purple flower; but these do not differ in any other respect than the colour of their flowers from the common, therefore I have only mentioned them as varieties.

The common Bugle is greatly esteemed as a vulnerary herb, and is used both internally and externally; it enters as an ingredient into the vulnerary decoctions of the surgeons, and is commended externally, applied to ulcers. As this grows naturally wild in great plenty, so it is seldom admitted into gardens.

The second fort grows naturally on the *Alps*, the leaves of this are much longer than those of the common Bugle, the stalks are weaker, and decline on every side, and the whorls of flowers are much smaller, and are ranged at a greater distance.

The third fort grows naturally in *France*, *Germany*, and other countries. It grows about four or five inches high, with a single stalk, which is garnished with leaves placed opposite. The flowers grow in whorls round the stalks, and toward the top form a close thick spike, and are of a fine blue colour.

The fourth fort grows naturally in many parts of *Europe*. This approaches near to the common Bugle, but the leaves of this are woolly, and the flower cups are very hairy. There are two varieties of this, one with a white, and the other a red flower.

The fifth fort was brought from the *Levant* by Dr. *Tournefort*, and is preserved by those who are curious in collecting rare plants.

This fort requires a little protection in winter, therefore the plants should be planted in pots filled with a loamy soil, and placed in a shady situation in summer; but in the winter they must be removed under a common frame, where they may enjoy as much free air as possible in mild weather.

This may be propagated by seeds, which should be sown soon after it is ripe, in a pot, and placed in a shady situation till autumn, when it should be removed under a frame, where it may be screened from hard frost. In the spring the plants will come up, which should be transplanted into separate pots as soon as they are strong enough to remove, and, in summer, placed in the shade, and treated as the old plants.

All the other forts are hardy enough, and are easily multiplied by their side shoots; these delight in a moist shady situation, where they are apt to spread too much, especially the two first forts.

BULBINE. See Anthericum.

BULBOCASTANUM. See Bunium.

BULBOCODIUM. *Tourn. Cor.* 50.

The Characters are,

The flower hath no empalement, it is funnel-shaped, and composed of six petals, which are concave. It hath six stamina, inserted in their middle. It hath an oval, blunt, three-cornered germen, which afterward becomes a triangular pointed capsule, having three cells, which are filled with angular seeds.

The Species are,

1. BULBOCODIUM *foliis subulato-linearibus. Prod. Leyd.* 41. Bulbocodium with narrow awl-shaped leaves.

2. BULBOCODIUM *foliis lanceolatis. Prod. Leyd.* 41. Bulbocodium with spear-shaped leaves; or, *Spanish Spring Meadow Saffron*.

The first fort grows naturally upon the *Alps*, and also upon *Snowdon*, in *Wales*. It hath a small bulbous root, which sends out a few long narrow leaves, somewhat like those of the Saffron, but are narrower; in the middle of these the flower comes out, which stands on the top of the foot-stalk, growing erect, and is shaped like those of the Crocus, but smaller; the foot-stalk rises about three inches high, and hath four or five short narrow leaves placed alternately upon it below the flower. This flowers in *March*, and the seeds are ripe in *May*.

The second fort grows naturally in *Spain*. It hath a bulbous root, shaped like those of the Snowdrop, which sends out three or four spear-shaped concave leaves, between which comes out the flower, standing on a very short foot-stalk; these, when they first appear, are of a pale colour, but afterward change to a white purple. It produces the flowers about the same time with the first.

These plants are propagated by offsets, in the same manner as other bulbous rooted flowers. The time to remove them, is soon after their leaves decay, but the roots may be kept out of the ground two months without prejudice at that season. They should not be removed oftener than every third year, for their roots do not multiply very fast, so by suffering them to remain, they will flower much stronger, and make a greater increase than if they are often taken up.

BUNIAS. *Lin. Gen. Plant.* 737.

The Characters are,

The flower hath four petals, placed in form of a cross, joined at their base, and erect. It hath six stamina, two of which are opposite, and shorter than the other. In the center is situated an oblong germen, which afterward becomes an irregular short oval pod, with four angles, one or other of which is prominent and pointed, inclosing one or two roundish seeds.

The Species are,

1. BUNIAS *filiculis ovatis gibbis verrucosis. Lin. Sp. Plant.* 670. Bunias with oval convex pods, having protuberances; or, *Eastern Sea Kale*.

2. BUNIAS *filiculis tetragonis angulis bicristatis. Lin. Sp. Pl.* Bunias with short four-cornered pods, whose angles are doubly crested.

3. BUNIAS *filiculis ovatis levibus ancipitibus. Lin. Sp. Pl.* 670. Bunias with smooth oval pods, standing two ways on the stalk.

The first fort grows naturally in the *Levant*. This hath a perennial root, and an annual stalk. It sends out many oblong leaves, which spread on every side, and are deeply jagged on their edges, like those of the Dandelion; from between these arise the stalks, which grow upwards of two feet high, sending out branches on every side, which are garnished at each joint by one oblong sharp pointed leaf, eared at the base. The branches are terminated by long loose spikes of yellow flowers, composed of four leaves, shaped like those of the Cabbage; these are succeeded by short oval rough pods, ending in a point, inclosing one round seed.

The second fort grows naturally in the south of *France* and *Italy*. This is an annual plant, which branches on every side, and incline toward the ground. These are garnished with glaucous leaves, which are deeply divided into many parts, almost like those of Swines Cress. The flowers are produced singly from the wings of the leaves; these are very small, of a pale yellowish colour, which are succeeded by short pods, crested on each side, containing one or two roundish seeds.

The third fort grows naturally about *Montpelier*; this is an annual plant, which sends out many oblong leaves near the root, deeply cut on each side, and spread on the ground; between these arise two or three stalks, which grow a foot and an half high, sending out several side branches, which are garnished with oblong rough leaves, indented on their edges; the upper part of the branches are destitute of leaves, but have flowers placed alternately on each side the branches, standing on short foot-stalks, which are purple; these are succeeded by oval pointed pods, containing one or two roundish seeds.

These plants are all propagated by seed; the first fort may be sown where the plants are designed to remain in the beginning of *April*; and when the plants come up, they should be thinned, leaving them two feet asunder, after which they will require no other care but to keep them clean from weeds.

The other two forts must be sown where they are to remain, but the best time is in autumn, because those which are sown in the spring often fail, or do not come up time enough to perfect their seeds. These require no other culture

ture but to keep them clean from weeds, and thin the plants to one foot distance.

BUNIUM. *Lin. Gen. Plant.* 298. Pig Nut or Earth Nut.

The Characters are,

The involucre of the great umbel, is composed of many short narrow leaves. The proper empalement of the flower is scarce discernable. The flowers have five heart shaped petals which are equal, and turn inward; they have five stamina; the oblong germen is situated below the receptacle, which afterward becomes an oval fruit dividing in two parts, containing two oval seeds.

The Species are,

1. **BUNIUM** *bulbo globofo.* *Sauv. Monsp.* 256. Earth Nut with a globular root.

2. **BUNIUM** *radice turbinato.* Earth Nut with a turbinated root.

3. **BUNIUM** *foliis tripartitis filiformibus linearibus.* Earth Nut with very narrow tripartite leaves.

The first sort grows naturally in moist pastures, and in woods in many parts of *England*; of this there is a variety, supposed to be larger than that which grows commonly here. This hath a tuberous solid root, which lies deep in the ground. The leaves are finely cut, and lie near the ground. The stalk rises a foot and an half high, which is round, channelled, and solid; the lower part being naked, but above, where it branches out, there is one leaf placed below every branch. The flowers are white, and shaped like those of other umbelliferous plants; the seeds are small, oblong, and when ripe are channelled.

The roots of this sort are frequently dug up, and by the poorer sort of people are eaten raw, having much resemblance in taste to the Chestnut, from whence it had the title of *Bulbocastanum*.

The second sort was discovered by *Dr. Tournefort* in the island of *Crete*, but it grows naturally in many other parts of, the *Lewant*.

The third sort I received from the *Alps*. This is a very low plant, seldom rising above six inches high.

These plants delight to grow among grass, so cannot without difficulty be made to thrive long in a garden.

BUPHTHALMUM. *Lin. Gen. Pl.* 876. Ox-eye.

The Characters are,

It hath a compound radiated flower, composed of hermaphrodite and female florets. The hermaphrodite flowers compose the disk, and are funnel-shaped. In the center is situated an oval compressed germen, which afterward becomes an oblong seed. The female flowers which compose the rays are stretched out on one side like a tongue, and are indented at the top in three parts; these have no stamina, but a double headed germen, which becomes a single compressed seed, cut on each side.

The Species are,

1. **BUPHTHALMUM** *calycibus foliosis, foliis cordatis serratis trinerviis basi hinc brevioribus.* *Hort. Upsal.* 264. Ox eye with a leafy empalement, heart shaped sawed leaves, having three veins, and the base on one side shorter than the other.

2. **BUPHTHALMUM** *foliis lanceolatis subdenticulatis glabris, calycibus nudis.* *Hort. Cliff.* 415. Ox-eye with smooth spear-shaped leaves (indented below) and naked empalements.

3. **BUPHTHALMUM** *foliis lanceolatis subserratis viliosis calycibus nudis.* *Hort. Cliff.* 414. Ox eye with spear-shaped leaves, sawed below and hairy, and naked empalements.

4. **BUPHTHALMUM** *calycibus acutè foliosis, ramis alternis, foliis lanceolatis amplexicaulis integerrimis.* *Hort. Cliff.* 414. Ox-eye with acute leafy empalements, branches placed alternate, and entire leaves embracing the stalks.

5. **BUPHTHALMUM** *calycibus obtusè foliosis pedunculatis, ramis alternis, foliis cuneiformibus.* *Hort. Cliff.* 414. Ox-eye with blunt leafy empalements, having foot stalks, alternate branches, and wedge-shaped leaves.

6. **BUPHTHALMUM** *calycibus obtusè foliosis sessilibus, axil-*

laribus, foliis oblongis obtusis. *Hort. Cliff.* 414. Ox-eye with blunt leafy empalements, sitting close to the side of the stalks, and oblong blunt leaves.

7. **BUPHTHALMUM** *foliis oppositis lanceolatis petiolatis bidentatis.* *Hort. Cliff.* 415. Ox eye with spear-shaped leaves growing opposite, with foot stalks having two teeth.

8. **BUPHTHALMUM** *foliis oppositis linear lanceolatis crassis, glabris, floribus pedunculatis.* Ox-eye with thick, smooth, narrow, spear-shaped leaves growing opposite, and flowers having foot-stalks.

9. **BUPHTHALMUM** *foliis oppositis linear lanceolatis crassis incanis, floribus sessilibus.* Ox-eye with thick, hoary, narrow, spear-shaped leaves placed opposite, and flowers growing close to the branches.

The first sort grows naturally in *North America*; this hath a perennial root, and an annual stalk, which rises upward of six feet high, garnished at each joint with two oblong heart-shaped leaves, which have three longitudinal veins, and the base on one side shorter than the other. The flowers come out at the extremity of the branches, having a leafy empalement; these are of a bright yellow colour, resembling a small Sun flower, from whence the inhabitants of *America* have given it that appellation. It propagates easily by parting of the roots. The best time to transplant and part the roots, is toward the end of *October*, when the stalks begin to decay. These should be removed every other year, to prevent their spreading too far; they are very hardy, so will thrive in any situation, and are proper for large borders on the sides of rural walks, or in spaces between shrubs.

The second sort grows naturally on the *Alps*, as also in *Austria, Italy*, and the south of *France*. This hath also a perennial root, and an annual stalk; it grows near two feet high, with slender branching stalks, garnished with oblong smooth leaves; the flowers grow at the extremity of the branches, of a bright yellow colour, like those of *Starwort*. There are two or three varieties of this, differing in the breadth of their leaves and size of their flowers, but from the same seeds all these have been produced.

This sort may be propagated by parting of the roots, at the same time, and in the same manner as is directed for the second sort.

The third sort is somewhat like the second, but the leaves are broader and obtuse; the stalks and leaves are also hairy, in which consists their difference.

The fourth sort is an annual plant, which grows naturally in the south of *France, Italy, Spain*, and *Sicily*. The stalks rise two feet and an half high, and divide into many branches upward, and the side branches rise above the middle stalk. They are garnished with spear-shaped hairy leaves, placed alternately; the flowers are produced at the end of the branches, on short foot-stalks; the empalement consists of seven long stiff spear-shaped leaves, ending in a sharp point. The flower sits close upon the empalement, the border or rays being composed of many female florets. The middle or disk of the flower, is composed of hermaphrodite flowers, which are tubulous and funnel-shaped. They are of a bright yellow colour, and are succeeded by oblong compressed seeds.

The seeds of these should be sown in *April*, on open borders, where they are to remain, and will require no other care, but to keep them clear of weeds, and thin them to the distance of a foot and an half, that their branches may have room to spread.

The fifth and sixth sorts are also annual plants, which grow naturally in the same countries with the two last. These seldom grow more than one foot high in gardens, but send out many spreading branches near the root; the leaves are oblong, blunt, and hairy. The flowers of these have much the appearance of those of the last, but are smaller,

smaller, and those of the sixth sort have an agreeable odour.

The fifth sort is a low perennial plant, with a shrubby stalk, which rarely rises a foot high, sending out many spreading branches from the stem, garnished with hairy leaves, which are very narrow at their base, but broad and roundish at their extremity; the flowers are produced at the end of the branches, which are yellow, and shaped like those of the former sorts, but the leaves of the empalement are soft and obtuse. These are rarely succeeded by seeds in *England*, but the plant is easily propagated by slips during the summer season, which will take root in about six weeks, when they should be carefully taken up, and each planted in a separate small pot, and placed in a shady situation till they have taken fresh root, after which they may be removed to an open situation, where they may remain till the end of *October*, when they must be removed to a frame for the winter season, being too tender to live abroad in this country; but as they only require protection from hard frosts, so they will thrive better when they have a great share of air in mild weather, than if confined in a green-house; therefore the best method is to place them in a common frame, where they may be fully exposed in mild weather, but screened from the frost.

The seventh sort rises with several woody stems, which grow to the height of eight or ten feet, garnished with leaves very unequal in size; some are narrow and long, others are broad and obtuse; these are intermixed at the same joint, and often at the intermediate one; they are soft, hoary, and placed opposite: the foot-stalks of the larger leaves have on their upper side, near their base, two sharp teeth standing upward. The flowers are produced at the ends of the branches; they are of a pale yellow colour, and have scaly empalements. This sort has been long preserved in the *English* gardens, and was originally brought from *Virginia*.

The eighth sort grows naturally in the *Bahama Islands*. This seldom grows much more than three feet high. It has succulent spear-shaped leaves placed opposite; the flowers are produced at the end of the branches, which are larger than those of the seventh sort, and are of a bright yellow colour. I received this also from the *Hawannah*, where it grows plentifully on the borders of the sea.

The ninth sort grows in the *Bahama Islands*. This sends out many slender stalks from the root, which rise near three feet high, with long narrow thick succulent leaves, which are very hoary, growing opposite, embracing the stalk at their base; the flowers are yellow, and are produced at the ends of the shoots, having very short foot-stalks.

As the three last sorts do not perfect their seeds in this country, so they are propagated by cuttings, which should be planted in *July*, when the plants have been for some time exposed to the open air, whereby their shoots will be hardened and better prepared to take root, than when they first come abroad. They should be planted in small pots filled with light loamy earth, and plunged into a very gentle warmth, observing to shade them from the sun in the heat of the day. In about six weeks these will have taken root, when they must be gradually inured to bear the open air, and soon after they should be each planted in a separate small pot, filled with light loamy earth, and placed in the shade until they have taken fresh root; after which they may be removed to a sheltered situation, where they may remain till the middle of *October*, when they must be removed into the green-house. During the winter, they should have but little moisture, and in very mild weather they should have fresh air admitted to them. In the summer they must be placed abroad in a sheltered situation, and treated in the same manner as other exotic plants.

BUPLEUROIDES. See *Phyllis*.

BUPLEURUM, Hare's-ear.

The Characters are,

It is a plant with an umbellated flower; the rays of the principal umbel are thin; the involucre of the great umbel is composed of many leaves, those of the small have five. The flower hath five small heart-shaped petals, which are inflexed; it hath five slender stamina. The germen is situated below the flower, which afterward becomes a roundish compressed fruit which is channelled, dividing in two parts, containing two oblong channelled seeds.

The Species are,

1. BUPLEURUM *involucris universalibus nullis, foliis perfoliatis*. Hort. Upsal. 64. The most common or Field Thorough Wax.

2. BUPLEURUM *involucellis pentaphyllis orbiculatis, universalis triphylo ovato, foliis amplexicaulibus cordato-lanceolatis*. Lin. Sp. Pl. 236. Greater narrow-leaved Thorough Wax of the Alps, with an angular leaf.

3. BUPLEURUM *involucellis pentaphyllis acutis, universalis triphylo, foscule centrali altiore, ramis divaricatis*. Lin. Sp. Plant. 237. Smaller narrow-leaved Thorough Wax with a Hare's-ear leaf.

4. BUPLEURUM *caule dichotomo subnudo, involucris minimis acutis*. Lin. Sp. Pl. 238. Hare's ear with a stiff leaf.

5. BUPLEURUM *umbellis simplicibus alternis pentaphyllis subtrifloris*. Lin. Sp. Plant. 238. Hare's-ear with a very narrow leaf.

6. BUPLEURUM *frutescens, foliis obovatis integerrimis*. Lin. Sp. Pl. 238. Shrubby Hartwort of *Ethiopia*.

7. BUPLEURUM *frutescens, foliis vernalibus decompositis planis incis, aestivalibus filiformibus angulatis trifidis*. Lin. Sp. Plant. 238. Shrubby Hare's-ear, whose spring leaves are decomposed, plain and cut, and the summer leaves are narrow, angular, and trifid.

The first sort grows naturally upon chalky land amongst Wheat, in several parts of *England*, so is seldom admitted into gardens. The leaves and seeds of this plant are used in medicine; the herb is esteemed good for dissolving scrophulous tumours, and is by some used for internal ailments, ruptures, and bruises from a fall. This is an annual plant.

The second, third, fourth, and fifth sorts, are also annual. The fifth sort grows naturally in several parts of *England*, the others are natives of the Alps and Pyrenees; these are seldom cultivated but in botanick gardens for the sake of variety. Their seeds should be sown in autumn, where the plants are designed to remain, and keep the plants clean from weeds, which is all the culture they require.

The sixth sort hath a woody stem, which sends out many branches on every side, so as to form a large head or bush, with oblong oval stiff leaves, which are very smooth, and of a sea-green colour; the ends of the branches are terminated by umbels of yellow flowers, somewhat like those of Fennel.

It is commonly known among gardeners by the title of shrubby *Ethiopian* Hartwort, and is now propagated in the nursery gardens for sale. It grows five or six feet high, forming a large regular bush, and the leaves continuing green through the year render it more valuable. It is hardy, so will live in the open air, and may be intermixed with other ever-green shrubs of the same growth, where they will make an agreeable variety. It is propagated by cuttings, which should be planted in pots, and in winter sheltered under a hot bed frame; in the spring the cuttings will put out roots, but they will not be fit to transplant till the autumn following; so the pots should be placed in a shady situation in summer. The young plants may be planted in a nursery bed at two feet distance, for a year or two to get strength, and then transplanted where they are to remain.

The seventh sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk to the height of five or six feet, sending out some side branches, which in the spring have their lower parts garnished with leaves composed of many small plain lobes, which are finely cut like those of Coriander, and of a sea green colour; these leaves soon fall off, and the upper part of the branches are closely covered with long Rush like leaves having four angles, which come out in clusters from each joint. The flowers grow in spreading umbels at the extremity of the branches, which are small and of an herbaceous colour, and are succeeded by oblong channelled seeds.

This sort is propagated by cuttings, which do readily take root, if they are planted in *April* in pots, and plunged into a moderate hot-bed. When they have taken root, they should be inured to the open air by degrees, and after having obtained strength, they may be planted each into a separate pot, placing them in the shade, till they have taken fresh root, when they may be placed with other exotic plants in a sheltered situation, where they may remain till the autumn, when they must be removed into the greenhouse, and placed with such hardy plants as require a large share of air in mild weather, and only require protection from frost.

BURNET. See *Poterium* and *Sanguisorba*.

BURSA PASTORIS, Shepherds pouch

This is a common weed in most parts of *England*, which propagates so fast by seeds, as not to be easily cleared when they are permitted to shed; for there are commonly four or five generations of this plant from seeds in a year, so fast does the seed ripen, and the plants come up; therefore it cannot be too soon rooted out of a garden.

BUTOMUS, the Flowering-rush, or Water-gladiole.

The Characters are,

The flowers grow in a single umbel; they have six roundish concave petals, which are alternately smaller, and nine awl-shaped stamina, six of which surround the other. It hath six oblong pointed germen, which afterward become six oblong pointed capsules, having one cell filled with oblong seeds.

We know but one Species of this genus, viz.

BUTOMUS. *Fl. Lap.* 159. The Flowering-rush, or Water-gladiole.

There are two varieties of this plant, one with a Rose-coloured flower, and the other with a white flower; but these are only accidental variations, therefore not to be enumerated as distinct species.

The Rose-coloured sort is pretty common in standing waters, in many parts of *England*; the other is a variety of this, though less common with us near *London*. These plants may be propagated in boggy places, or by planting them in cisterns, which should be kept filled with water, that should have about a foot thickness of earth in the bottom, into which the roots should be planted, or the seed sown as soon as they are ripe; these, though common plants, yet produce very pretty flowers, and are worth propagating for variety's sake, especially if in any part of the garden there should be conveniency for an artificial bog, or where there are ponds of

standing water, as is many times the case, and persons are at a loss what to plant in such places, that may appear beautiful.

BUXUS, the Box Tree.

The Characters are,

It hath male and female flowers on the same plant; the male flowers have a three leaved, and the female a four leaved empalement. The male flowers have two, and the female three concave petals. The male flowers have four upright stamina, with a rudiment of a germen, but no style or stigma. The female flowers have roundish, blunt, three-cornered germen. The empalement afterward becomes a roundish capsule, shaped like an inverted portage pot, opening in three cells, each having two oblong seeds.

The Species are,

1. *Buxus arborescens, foliis ovatis*. Box Tree with oval leaves.

2. *Buxus arborescens foliis lanceolatis*. Narrow-leaved Box.

3. *Buxus humilis foliis orbiculatis*. Dwarf or Dutch Box.

The two sorts of Tree Box have been frequently raised from seeds, and constantly produced plants of the same kind from those the seeds were taken from; and the Dwarf Box will never rise to any considerable height with any culture, nor have I ever seen this sort flower, where the plants have been encouraged to grow many years in the greatest luxuriance. There are two or three varieties of the first sort, which are propagated in the gardens, one with yellow, and the other white striped leaves. The other hath the tops of the leaves only marked with yellow, which is called Tipped Box.

The first and second sorts grow in great plenty upon *Box-hill* near *Dorking* in *Surry*, where were formerly large trees of these kinds, but of late they have been pretty much destroyed; yet there are great numbers of the trees remaining, which are of a considerable bigness.

The tree or large Box are proper to intermix in clumps of Ever-greens, &c. where they add to the variety of such plantations; these may be propagated by planting the cuttings in autumn in a shady border. When they are well rooted, they may be transplanted into nurseries, till they are fit for the purposes intended. The best season for removing these trees is in *October*, though indeed, if care be used to take them up with a good ball of earth, they may be transplanted almost at any time, except in the middle of summer: these trees are a very great ornament to cold and barren soils, where few other things will grow.

The dwarf kind of Box is used for bordering of flower beds, or borders; for which purpose it far exceeds any other plant, it being subject to no injuries from cold or heat, and is of long duration; is very easily kept handsome, and, by the firmness of its rooting, keeps the mould in the borders from washing into the gravel-walks, more effectually than any plant whatever. This is increased by parting the roots, or planting the slips; but as it makes so great an increase of itself, and so easily parts, it is hardly worth while to plant the slips that have no roots.

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CAAPEBA. See Cissampelus.
CABBAGE. See Brassica.
CACALIANTHEMUM. See Cacalia.
CACALIA, Foreign Coltsfoot.

The Characters are,

It hath compound flowers, which are included in one common cylindrical empalement: the flowers are tubulous and funnel-shaped; these have each five short slender stamina. The germen is crowned with down, which afterward becomes a single oblong seed, crowned with long down.

The Species are,

1. *CACALIA foliis reniformibus acutis denticulatis*. Lin. Sp. Plant. 836. Cacalia with kidney-shaped leaves, which are sharply indented.

2. *CACALIA foliis cordatis serratis glabris*. Cacalia with smooth heart-shaped leaves, sawed on their edges.

3. *CACALIA caule herbaceo foliis hastato-sagittatis denticulatis, petiolis supernè dilatatis*. Hort. Upsal. 254. Taller American Cacalia with a triangular leaf eared at the base, and white flowers.

4. *CACALIA caule herbaceo, foliis subcordatis, dentato-sinuatis, calycibus quinquesloris*. Lin. Sp. Plant. 835. Cacalia with an herbaceous stalk, heart-shaped sinuated leaves, and five florets in each empalement.

5. *CACALIA caule fruticoso, foliis compressis carnosis*. Lin. Sp. Plant. 834. African Tree Groundsel with the leaf and appearance of Fig Marigold.

6. *CACALIA caule fruticoso composito, foliis lanceolatis planis, petiolorum cicatricibus obsolete*. Lin. Sp. Pl. 834. Cacalia with a compound shrubby stalk, and plain spear-shaped leaves, and the foot-stalks leaving scars.

7. *CACALIA caule fruticoso obvallato spinis petiolaribus truncatis*. Lin. Sp. Plant. 834. Cacalia with a shrubby stalk, guarded on every side with broken rough foot-stalks.

8. *CACALIA caule fruticoso, foliis ovato-oblongis, petiolis basi linea triplici deductis*. Lin. Sp. Pl. 834. Cacalia with a shrubby stalk, oblong oval leaves, and three lines connected to the base of the foot-stalk.

The first sort grows naturally in *Austria*, and the *Helvetian* mountains, but is frequently preserved in curious gardens for the sake of variety. It hath a fleshy root which spreads in the ground, from which springs up many leaves, standing on single foot-stalks, shaped like those of Ground Ivy, but are of a thicker texture, of a shining green on their upper side, but white on their under side; between these arise the stalk, which is round, branching toward the top, and grows a foot and an half high; the branches are terminated by purplish flowers, growing in a sort of umbel. These are succeeded by oblong seeds, crowned with down.

The second sort hath the appearance of the first, but the leaves are heart-shaped, pointed, and sharply sawed on their edges, and on both sides very green; the stalks rise higher, and the leaves upon the stalks have much longer foot-stalks than those of the first. The flowers of this are of a deeper purple colour.

The third sort grows naturally in *North America*. This

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hath a perennial creeping root, which sends out many stalks, garnished with triangular spear-shaped leaves, sharply sawed on their edges. The stalks rise to the height of seven or eight feet, and are terminated by umbels of white flowers, which are succeeded by oblong seeds crowned with down. This plant multiplies greatly by its spreading roots, and also by the seeds, which are spread to a great distance by the wind, the down which adheres to them being greatly assisting to their conveyance.

The fourth sort is a native of *America*. This hath a perennial root, and an annual stalk, which rises four or five feet high, garnished with roundish heart-shaped leaves, greatly indented on their edges, of a sea-green on the under side, but darker above; the stalks are terminated by umbels of yellowish herbaceous flowers.

The first and second sorts are propagated by parting of their roots, for they seldom produce good seeds in *England*. The best time to transplant and part their roots is in the autumn. They require a loamy soil, and a shady situation.

The third and fourth sorts propagate in great plenty, both by their spreading roots, and also their seeds. The roots should be transplanted in autumn, and require a moist soil and an open situation.

The fifth sort grows naturally at the *Cape of Good Hope*. This rises with strong round stalks, to the height of seven or eight feet, which are woody at bottom, but soft and succulent upward, sending out many irregular branches, which are garnished with thick taper succulent leaves, a little compressed on two sides, ending in points, and are covered with a whitish glaucous farina, which comes off when handled. At the extremity of the branches the flowers are produced in small umbels; they are white, tubulous, and cut into five parts at the top. Some of the noblemen in *France* have the leaves of this plant pickled, in the doing of which, they have a contrivance to preserve the white farina, with which they are covered, and thereby render them very beautiful.

This sort is easily propagated by cuttings, during the summer months: these should be cut from the plants, and laid to dry a fortnight, that the wound may be healed over before they are planted. If they are planted in *June*, or *July*, they will take root in the open air. I have frequently had the branches broken off by accident, and fallen on the ground, which have put out roots without any care. The plants should have a light sandy earth, and in winter be placed in an airy glass case, where they may enjoy the sun and air in mild weather, but must be protected from frost, and have but little water; they must be treated like the *Ficoides*, and other succulent plants from the same country.

The sixth sort grows naturally in the *Canary Islands*. This rises with a thick fleshy stem, divided at certain distances, as it were in so many joints; each of these divisions swell much larger in the middle, than they do at each end; toward their extremities they are garnished with long narrow spear-shaped leaves, of a glaucous colour. As these fall off, they leave a scar at the place, which always remains on the branches. The flowers are produced in large clusters,

at the extremity of the branches, which are tubulous, and of a faint Carnation colour.

This plant hath been called Cabbage tree, by the gardeners, I suppose from the resemblance which the stalks of it have to that of the Cabbage: others have titled it Carnation tree, from the shape of the leaves, and colour of the flowers.

It is propagated by cuttings, in the same manner as the former sort, and the plants require the same culture.

The seventh sort resembles the sixth in its form and manner of growth, but the leaves are narrower and more succulent. These do not fall off entire like the other, but break off at the beginning of the foot-stalk, which are very strong and thick. This sort hath not as yet produced any flowers in *England*. It is propagated in the same manner as the two former sorts, from cuttings, and the plants must be treated in the same way, as hath been directed for the fifth sort, but requires to be kept drier, both in winter and summer: This sort grows naturally at the *Cape of Good Hope*.

The eighth sort has been long preserved in the *English* gardens, and was generally titled Ante-uphorbium, supposing it to have a contrary quality to the Euphorbium. This rises with many succulent stalks from the root, as large as a man's finger, which branch out upward, into many irregular stalks of the same form, but smaller, and are garnished with flat oblong succulent leaves, placed alternately round the branches; under each foot-stalk there are three lines or ribs, which run longitudinally through the branches joined together. This sort very rarely flowers in *Europe*, but is propagated by cuttings in the same manner as the fifth, and is equally hardy.

CACAO. *Tourn. Inst. R. H.* 660. The Chocolate Nut.

The Characters are,

The flower hath five petals, which are irregularly indented; it hath five erect stamina. In the center is placed the oval germen, which afterward becomes an oblong pod, ending in a point, which is divided into five cells, filled with oval, compressed, fleshy seeds.

We have but one Species of this plant, viz.

CACAO. *Clus. Exot.* The Chocolate Nut Tree.

This tree is a native of *America*, and is found in great plenty in several places between the tropicks, but particularly at *Carracca* and *Carthogena*, on the river *Amazons*, in the isthmus of *Darien*, at *Honduras*, *Guatemala*, and *Nicaragua*. At all these places it grows naturally without culture; but it is cultivated in many of the islands which are possessed by the *French* and *Spaniards*, and was formerly planted in some of the islands which are in possession of the *English*.

In the making a plantation of Chocolate trees, you must first be very careful in the choice of the situation and the soil, otherwise there will be small hopes of success. As to the situation, it should be in a place where the trees may be protected from strong winds, to which if they are exposed, they will soon be destroyed: so that in such places where terrents of water have washed away the earth so as to leave broad and deep furrows (which the inhabitants of those islands call gullies), these trees will thrive exceedingly. The soil in these gullies is generally rich and moist, which is what these trees require, so that they will make great progress in these places; but where there are not a sufficient number of these gullies, choice should be made of a situation which is well sheltered by large trees; or, if there are not trees already grown, there should be three or four rows planted round the spot which is designed for the Chocolate trees, of such sorts which are of quickest growth; and within these rows there should be some Plantain trees planted at proper distances, which being very quick of growth, and the leaves being very large, will afford a kindly shelter to the young Chocolate trees placed between them.

The Chocolate trees which are cultivated, seldom grow

to be more than fourteen or fifteen feet in height, nor do they spread their branches very wide; so that if the Plantain trees are placed in rows, about twenty-four feet asunder, there will be room enough for two rows of Chocolate trees between each row of Plantains; and if they are planted at ten feet distance in the rows, it will be sufficient room for them.

The soil upon which these trees thrive to most advantage, is a moist, rich, deep earth; for they generally send forth one tap root, which runs very deep into the ground, so that wherever they meet with a rocky bottom near the surface, they seldom thrive, nor are of long continuance; but in a rich, deep, moist soil, they will produce fruit in pretty good plenty the third year from seed, and will continue fruitful for several years after.

Before the plantation is begun, the ground should be well prepared by digging it deep, and clearing it from the roots of the trees, and noxious plants, which, if suffered to remain in the ground, will shoot up again after the first rain, and greatly obstruct the growth of the plants; so that it will be almost impossible to clear the ground from those roots, after the Chocolate plants are come up, without greatly injuring them.

When the ground is thus prepared, the rows should be marked out by a line where the nuts are to be planted, so as that they may be placed in a quincunx order, at equal distances every way, or at least that the Plantain trees between them may form a quincunx, with the two rows of Chocolate trees, which are placed between each row of them.

In making a plantation of Chocolate nut trees, the nuts must be planted where the trees are to remain; for if the plants are transplanted, they seldom live; and those which survive it, will never make thriving trees; for, as I before observed, these trees have a tender tap root, which, if broken, or any way injured, the tree commonly decays.

The nuts should always be planted in a rainy season, or at least when it is cloudy weather, and some hopes of rain falling soon after. As the fruit ripens at two different seasons, viz. at *Midsummer*, and at *Christmas*, the plantation may be made at either of those; but the chief care must be to chuse such nuts as are perfectly ripe and sound, otherwise the whole trouble and expence will be lost. The manner of planting the nuts is, to make three holes in the ground, within two or three inches of each other, at the place where every tree is to stand; and into each of these holes should be one sound nut planted about two inches deep, covering them gently with earth. The reason for putting in three nuts at every place is, because they seldom all succeed; or, if most of them grow, the plants will not be all equally vigorous; so that when the plants have had one year's growth, it is very easy to draw up the weak unpromising plants, and leave the most vigorous; but in doing this, great care should be had to the remaining plants, so as not to injure or disturb their roots in drawing the other out.

It is very proper to observe, that the Chocolate nuts will not retain their growing faculty long after they are taken from the trees, so that there is no possibility of transporting them to any great distance for planting; nor should they be kept long out of the ground, in the natural places of their growth.

When the Chocolate trees first appear above ground, they are very tender, and subject to great injuries from the strong winds, the scorching sun, or great droughts, for which reason the planters are obliged to guard against all these enemies, first, by making choice of a sheltered situation, or at least by planting trees to form a shelter; and, if possible, to have the plantation near a river, for the conveniency of watering the plants the first season, until they have made strong roots, and are capable of drawing their nourishment from some depth in the earth, where they meet with moisture.

The Plantains, which will be fit to cut in about twelve months after planting, will defray the whole expence of preparing the ground, so that the produce of the Chocolate trees will be neat profit; for as the Plantains produce fruit and decay, they will be succeeded by suckers, which will produce fruit in eight months after; whereby there will be a continual supply of food for the negroes, which will more than pay for keeping the ground wrought, and clear from weeds, until the Chocolate trees begin to produce fruit, which is generally the third year after planting.

The planters usually set the Plantain trees two or three months before the Chocolate nuts are ripe, that they may be large enough to afford shelter to the young plants when they come up. Some people plant Potatoes, others Cucumbers and Melons, or Water Melons, between the rows of Chocolate plants; which, they say, will prevent the weeds from rising to injure the young plants; for as all these trail on the ground, they occupy the whole surface, and prevent the weeds from growing: but where this is practised, it should be done with great caution, lest, by being over covetous, you injure the young Chocolate nuts so much, as that they may never recover it.

In about seven or eight days after the Chocolate nuts are planted, the young plants will begin to appear above ground; when they should be carefully looked over, to see if any of them are attacked by insects; in which case, if the insects are not timely destroyed, they will soon devour all the young plants; or if there should be any weeds produced near the plants, they should be carefully cut down with a hoe; in doing which, great care should be taken that the tender shoot, nor the rind of the bark are injured. About twenty days after the plants have appeared, they will be five or six inches high, and have four or six leaves, according to the strength of the plants. In ten or twelve months they will be two feet and an half high, and have fourteen or sixteen leaves.

In two years time the plants will have grown to the height of three feet and an half, and sometimes four feet, many of which will begin to flower; but the careful planters always pull off all these blossoms, for if they are permitted to remain to produce fruit, they will so much weaken the trees, that they seldom recover their strength again, so as to become vigorous. When these plants are two years and an half old, they will produce flowers again, some of which are often left to bear fruit; but the most curious planters pull off all these, and never leave any to produce fruit until the third year; and then but a few, in proportion to the strength of the trees; by which method their trees always produce larger and better nourished fruit, than those which are suffered to bear a larger quantity, and will continue much longer in vigour. The fourth year they suffer their trees to bear a moderate crop; but they generally pull off some flowers from those trees which are weak, that they may recover strength before they are too old.

From the time when the flowers fall off, to the maturity of the fruit, is about four months. It is easy to know when the fruit is ripe, by the colour of the pods, which become yellow on the side next the sun. In gathering of the fruit, they generally place a negroe to each row of trees; who, being furnished with a basket, goes from tree to tree, and cuts off all those which are ripe, leaving the others for a longer time to ripen. When the basket is full, he carries the fruit, and lays it in an heap at one end of the plantation; where, after they have gathered the whole plantation, they cut the pods lengthways, and take out all the nuts, being careful to divest them of the pulp which closely adheres to them; and then they carry them to the house, where they lay them in large casks, or other vessels of wood, raised above ground, and cover them with leaves of the *Indian Reed*

and mats, upon which they lay some boards, putting some stones thereon to keep them down close, in order to press the nuts. In these vessels the nuts are kept four or five days; during which time, they must be stirred and turned every morning, otherwise they will be in danger of perishing from the great fermentation they are usually in. In this time they change from being white to a dark red or brown colour. Without this fermentation, they say the nuts will not keep; but will sprout, if they are in a damp place, or shrivel and dry too much, if they are exposed to heat.

After the nuts have been thus fermented, they should be taken out of the vessels and spread on coarse cloths, where they may be exposed to the sun and wind; but at night, or in rainy weather, they must be taken under shelter, otherwise the damp will spoil them. If the weather proves fair, three days time will be long enough to dry them, provided they are carefully turned from time to time, that they may dry equally on every side. When they are perfectly dry, they may be put up in boxes or sacks, and preserved in a dry place until they are shipped off, or otherwise disposed of. The fresher these nuts are, the more oil is contained in them; so that the older they are, the less they are esteemed.

When the trees are full grown and vigorous, they will sometimes produce two hundred, or two hundred and forty pods, at one season; which will make ten or twelve pounds of Chocolate, when dried; so that it is a very profitable commodity, and can be managed with very little charge, when compared with sugar.

The Chocolate trees, if planted on a good soil, and properly taken care of, will continue vigorous and fruitful twenty-five or thirty years: therefore the charge of cultivating a plantation of these trees, must be much less than that of sugar; for although the ground between the rows of plants will require to be often hoed and wrought, yet the first working of a ground to make a new plantation of Sugar, Indigo, Cassada, &c. is a larger expence than the after-workings are. Besides, Sugar canes require as much labour in their cultivation as any plant whatever.

The leaves of these trees being large, make a great litter upon the ground when they fall; but is not injurious, but rather of service to the trees; for the surface of the ground being covered with them, they preserve the moisture in the ground, and prevent its evaporating; which is of great use to the young tender roots, which are just under the surface; and when the leaves are rotten, they may be buried in digging the ground, and it will serve as good manure. Some planters let the pods, in which the Chocolate is inclosed, lie and rot in a heap (after they have taken the nuts out) which they also spread on the ground instead of dung.

Besides the ordinary care of digging, hoeing, and manuring the plantations of Chocolate trees, there is also another thing requisite in order to their doing well; which is, to prune the decayed branches off, and to take away small ill placed branches, wherever they are produced. But you should be cautious how this work is performed; for there should be no vigorous branches shortened, nor any large amputations made on these trees, because they abound with a soft glutinous milky juice, which will flow out for many days whenever they are wounded, which greatly weakens the trees.

In order to cultivate this plant in *Europe*, by way of curiosity, it will be necessary to have the nuts planted into boxes of earth (in the countries where they grow) soon after they are ripe; because, if the nuts are sent over, they will lose their growing quality before they arrive. These boxes should be placed in a shady situation, and must be frequently watered, in order to forward the vegetation of the

the nuts. In about a fortnight after the nuts are planted, the plants will appear above-ground; when they should be carefully watered in dry weather, and protected from the violent heat of the sun. When the plants are grown strong enough to transport, they should be shipped and placed where they may be screened from strong winds, salt water, and the violent heat of the sun. During their passage they must be frequently refreshed with water; but it must not be given them in great quantities, lest it rot the tender fibres of their roots; and when they come into a cool latitude, they must be carefully protected from the cold, when they will not require so frequently to be watered: for in a moderate degree of heat, if they have gentle waterings once a week, it will be sufficient.

When the plants arrive in *England*, they should be carefully taken out of the boxes, and each transplanted into a separate pot filled with light rich earth, and plunged into a moderate hot-bed of tanners bark. In this hot-bed the plants may remain till *Michaelmas*, when they must be removed into the bark stove, and plunged into the tan, in the warmest part of the stove. During the winter season the plants must be frequently refreshed with water, but it must be given to them in small quantities; yet in summer they will require a more plentiful share. These plants are too tender to live in the open air in this country, even in the hottest season of the year; therefore must constantly remain in the bark stove, observing in very warm weather, to let in a large share of fresh air to them, and in winter to keep them very warm. The leaves of these plants must be frequently washed, to clear them from filth, which they are subject to contract by remaining constantly in the house; and this becomes an harbour for small insects, which will infest the plants, and destroy them, if they are not timely washed off. If these rules are duly observed, the plants will thrive very well, and may produce flowers in this climate: but it will be very difficult to obtain fruit from them; for, being of a very tender nature, they are subject to many accidents in a cold country.

CACHRYS. *Tourn. Inst.* 325. *Lin. Gen. Plant.* 304.

The Characters are,

It hath an umbellated flower; the involucre is composed of many narrow spear-shaped leaves: the flower hath five spear-shaped erect petals. It hath five single stamina. The turbinated germen is situated under the receptacle; the empalement afterward becomes a large oval blunt fruit dividing in two parts, each having one large fungous seed.

The Species are,

1. CACHRYS *foliis pinnatis, foliolis linearibus trifidis, fructu levi.* Cachrys with very narrow pinnated trifid leaves and a smooth fruit.
2. CACHRYS *foliis pinnatis, foliolis linearibus planis acutis, fructu rugoso.* Cachrys with narrow, plain, pinnated, acute leaves, and a rough fruit.
3. CACHRYS *foliis pinnatis foliolis acutis multifidis.* *Lin. Sp. Plant.* 246. Cachrys with pinnated, multifid leaves, which are acute.
4. CACHRYS *foliis pinnatis foliolis linearibus multifidis fructu sulcato plano.* Cachrys with very narrow, multifid, pinnated leaves, and a plain channelled fruit.
5. CACHRYS *foliorum impari lobato, hirsuto, semine fungoso sulcato plano.* Cachrys with hairy leaves, terminated with an odd lobe, and a plain channelled seed.

The first sort hath a thick fleshy root which strikes deep in the ground, from which springs out many narrow winged leaves resembling those of Giant-fennel; from between these arise a hollow fungous stalk about two feet high, terminated by a large umbel of yellow flowers, which are succeeded by oval smooth fungous fruit, dividing into two parts, each inclosing an oblong seed.

The second sort hath a large firm sweet smelling root which sends out several pinnated leaves like those of Hog's-fennel, but shorter. The stalk is smooth jointed, and rises four or five feet high, which is terminated by large umbels of yellow flowers, like those of Dill.

The third sort hath a thick fleshy root like the Fennel, which runs deep into the ground, sending out several narrow pinnated leaves, ending in many parts; between these arises a smooth jointed stalk, about three feet high, which is terminated by large umbels of flowers.

The fourth sort hath very thick roots, which strike deep in the ground, sending out very narrow pinnated leaves, like those of Hog's-fennel. The stalk rises five or six feet high, and is jointed like those of Fennel, terminated by large umbels of yellow flowers.

The first sort grows naturally in the south of *France* and *Spain*; the second and third in *Italy*; the fourth in *Sicily*, and the fifth in *Hungary*.

These plants are all propagated by seeds, which should be sown soon after they are ripe; for if they are kept out of the ground until the following spring, they often miscarry; and when they succeed, they never come up until the spring after; so that by sowing them in autumn, a whole year is saved, and the seeds seldom miscarry. These seeds should be sown on a shady border, where the plants are to remain; for the plants having long tap roots, will not bear transplanting so well as many other kinds. The distance to be observed for the sowing of their seeds should be three feet apart; so that if each kind is sown in a drill, when the plants are come up, they may be thinned, leaving two of the most promising plants of each kind to remain. These plants will begin to appear early in *April*, when they must be carefully cleared from weeds; and in dry weather they should be gently watered, which greatly promotes their growth the first year; after which time, they will require no farther care but to keep them clean from weeds, and every spring to dig the ground carefully between them, so as not to injure the roots.

These plants decay to the ground every autumn, and come up again in the spring: they commonly flower in the beginning of *June*, and their seeds are ripe in *September*: their roots sometimes run down three or four feet deep in the earth, provided the soil be light, and are often as large as Parsneps: they will continue many years, and if the soil is moist and rich, they will annually produce good seeds; but when they grow on a dry soil, the flowers commonly fall away, and are not succeeded by seeds.

CACTUS. *Lin. Gen. Plant.* 539.

The Characters are,

The flower is composed of six petals, which rests upon the embryo; it hath six long slender stamina. The oval germen, which is situated below the petals, afterward becomes a pyramidal fleshy fruit with one cell, filled with small angular seeds surrounded with pulp.

The Species are,

1. CACTUS *subrotundus quatuordecem angularis.* *Hort. Cliff.* 181. Roundish Cactus with fourteen angles; or, the Hedgehog Melon-thistle, commonly called Great Melon-thistle.
2. CACTUS *subrotundus quinquedecem angularis, angulis in spiram intortis, spinis erectis.* Roundish Cactus or Melon-thistle, with fifteen angles spirally twisted, and erect spines.
3. CACTUS *subrotundus quinquedecem angularis, spinis latis recurvis creberrimis.* Roundish Melon-thistle with fifteen angles, having broad recurved spines set very close.
4. CACTUS *subrotundus quatuordecem angularis, spinis longis recurvis albidis.* Roundish Melon-thistle with fourteen angles, and long white recurved spines.

5. *CACTUS subrotundus testus tuberculis ovatis barbatis.* Hort. Cliff. 181. Roundish Cactus closely covered with bearded tubercles; or, Smaller American Melon-thistle.

6. *CACTUS proliferus subrotundus, testus tuberculis ovatis, barbatis longis albidis.* Roundish prolifick Cactus with oval tubercles closely joined, having long white beards, commonly called Small Childing Melon-thistle.

These strange plants commonly grow upon the steep sides of rocks in the warmest parts of *America*, where they seem to be thrust out of the apertures, having little or no earth to support them, their roots shooting down into the fissures of the rock to a considerable depth, so that it is troublesome to get the plants up, especially as they are so strongly armed with thorns as to render it very dangerous to handle them.

The great sorts were some years since brought over to *England* in much greater plenty than of late; but then many of them were destroyed by the unskillfulness of those persons who had the care of them in the voyage; for, by giving them water, they generally caused them to rot before they were taken out of the ships; and some of those which have appeared to be sound, have been so replete with moisture, as to rot soon after they have been placed in the stoves; therefore whoever proposes to bring these plants from abroad, should be very careful to take up their roots as entire as possible, and to plant them in tubs filled with stones and rubbish, mixing very little earth with it, and to plant three or four plants in each tub, in proportion to their sizes; for if they are placed close together, it will save room; and as they do not increase in their growth during their passage, so there need not be any room allowed them for that purpose. There should be several pretty large holes bored through the bottom of these tubs, to let the moisture pass off; and if the plants are planted in the tubs, a month or more before they are put on board the ship, they will in that time have made new roots, which will be the most secure method to have them succeed; but, during their continuance in the country, they should have no water given them, unless the season should prove very hot and dry; and, in that case, it should be given to them sparingly; but after they are put on board the ship, they must not have any moisture whatever; therefore it will be a good method to cover the plants with tarpaulin, to keep off the spray of the sea in bad weather, and expose them at all times to the open air, when the sea is calm. By observing these directions, the plants may be brought to *England* in good health, provided they are brought in summer.

The third sort was brought into *England* by the late Dr. *William Housloun*, who procured the plants from *Mexico*; but as they were long in their passage, and had received wet, they were decayed before they arrived in *England*; but from the remains of them which were left, they appeared to be the most singular of all the species yet known. This has two order of thorns; one of which is strait, and set on at the joints in clusters, spreading out from the center each way like a star; and in the middle of each cluster is produced one broad flat thorn, near two inches in length, which stands erect, and is recurved at the point, and is of a brownish red colour. These thorns are, by the inhabitants of *Mexico*, set in gold or silver, and made use of for picking their teeth; and the plant is by them called *Visnaga*, i. e. Toothpick.

The sort with spiral ribs, as also that with white spines, I received from *Antigua*, with the common sort; but whether these are only accidental varieties, arising from the same seeds, or real different species, I cannot take upon me to determine, since, in this country, they are very rarely propagated by seeds; nor could I observe, in the several years that I have had these plants under my care, there was the least disposition in either of them to produce fruit; when, at the same time, the common large sort produced plenty of

fruit out of their caps every year, from the seeds of which I have raised some young plants; but although some of these have grown to a considerable size, yet none of them have as yet produced caps, therefore no fruit can be yet expected from them.

The fifth sort produces quantities of fruit annually; and as the seeds grow very readily, it is now very common in those gardens where there are stoves to keep them; for if the fruit is permitted to drop upon the earth of the pots, and that is not disturbed, there will plenty of plants come up without any farther trouble; and these seedling plants may be taken up as soon as they are of a proper size to remove, and planted six or seven of them into a small halfpenny pot, where they may stand one year; by which time they will be large enough to be each planted into a separate pot, and afterward they will make great progress. This sort is much more hardy than the large kind, so may be preserved in a moderate stove, or in a warm room, but the plants will not make near the progress as those which are kept in a greater degree of heat. It will continue many years with proper care, and the plants will grow to be a foot high, or more; but when they are so tall, the lower part of them is not so slightly, their green being decayed, and the spines changed to a dark dirty colour, they appear as if dead, so that the upper part of these old plants only seem to have life; whereas the plants of middling size appear healthy from top to bottom. The fruit are of a fine scarlet colour, and continue fresh upon the plants through the winter, which renders them very beautiful at that season. In the spring, when the fruit shrivels, and becomes dry, the seeds will be ripe, and may then be rubbed out, and sown upon the surface of the earth in small pots.

The sixth sort is but little larger than the fifth, growing nearly in the same form; but this produces a great number of young plants from the sides, by which it is increased. It produces tufts of a soft white down upon the knobs, and also between them at every joint, which makes the whole plant appear as if it was covered with fine Cotton. The flowers of this sort are produced from between the knobs, round the sides of the plants; which are in shape and colour very much like those of the fifth sort, but larger. These flowers are not succeeded by any fruit, at least all those which I have under my care, have not produced any, although they have produced plenty of flowers for some years; but from the same places where the flowers have appeared, there have been young plants thrust out the following season.

All the species of this genus are plants of a singular structure; but especially the larger kinds of them, which appear like a large fleshy green Melon, with deep ribs, set all over with strong sharp thorns, and when the plants are cut through the middle, their inside is a soft, pale, green, fleshy substance, very full of moisture. And I have been assured by persons of credit, who have lived in the *West-Indies*, that in times of great drought, the cattle repair to the barren rocks, which are covered with these plants, and after having ripped up the large plants with their horns, so as to tear off the outside skin with the thorns, they have greedily devoured all the fleshy moist parts of the plants, which has afforded them both meat and drink.

The fruit of all the sorts of Melon-thistles, are frequently eaten by the inhabitants of the *West-Indies*; there is scarce any difference in the fruits of all the kinds I have yet seen, either in size, shape, colour, or taste. They are about three quarters of an inch in length, of a taper form, drawing to a point at the bottom toward the plant, but blunt at the top, where the empalement of the flower was situated. The taste is an agreeable acid, which, in a hot country, must render the fruit more grateful.

All the larger sorts of these plants require a very good stove

stove to preserve them through the winter in *England*; nor should they be exposed to the open air in summer, for although they may continue fair to outward appearance, when they have been some time exposed abroad, yet they will imbibe moisture, which will cause them to rot soon after they are removed into the stove again. And this is frequently the case of those plants which are brought from abroad, which have a fair healthy appearance many times at their first arrival, but soon after decay, and this will happen very suddenly; scarce any appearance of disorder will be seen, till the whole plant is killed; which, in a few hours time, has often been the fate of the plants, when they have been placed in the stove.

If these plants are plunged into a hot-bed of tanners bark in summer, it will greatly forward them in their growth; but when this is practised, there should be scarce any water given to the plants, for the moisture which they will imbibe from the fermentation of the tan, will be sufficient for them, and more would cause them to rot. The best method to preserve all the large kinds is, in winter, to place the pots, either upon the top of the fires, or, at least, very near them, that they may have the warmest place of the stove; and during that season never to give them any water. The soil in which these should be planted, must be of a sandy nature, and if mixed with some dry lime rubbish, it will be still better. In the bottom of the pots should be placed some stones, in order to drain off any moisture which may be in the earth; for as these plants naturally grow upon the hot dry burning rocks, which have no earth, and, were it not for these plants, would be absolutely barren, we must imitate their natural soil as near as possible, making some allowance for the difference of the climates.

The great sorts may be propagated by seeds, which must be sown and managed as hath been directed for the smaller sort; but as the plants which are raised from seeds in *England*, will be some years in arriving to any considerable size, it will be much the best way to procure some plants from the *West-Indies*.

The two small sorts propagate so fast in *England*, as to render it unnecessary to send for plants of these kinds from abroad; for whoever hath a mind to be plentifully stocked with them, may be soon supplied; the fifth sort from seeds, and the sixth from the young plants which are thrust out from the side of the old.

CÆSALPINA. *Plum. Nov. Gen.* 9. Brasiletto.

The Characters are,

The flower hath five petals, which are situated like those of the butterfly flowers. It hath ten declining stamina which are distinct. It hath an oblong germen. The empalement afterward becomes an oblong compressed pod, with one cell inclosing three or four compressed seeds.

The Species are,

1. CÆSALPINA foliis duplicato-pinnatis foliolis emarginatis, floribus decandris. Cæsalpina with doubly winged leaves, whose small leaves are indented at the end, and flowers with ten stamina; commonly called Brasiletto.

2. CÆSALPINA foliis duplicato-pinnatis foliolis ovatis integerrimis floribus pentandris. Cæsalpina with doubly winged leaves, whose small leaves are oval and entire, and flowers with five stamina.

The first sort is the tree which affords the Brasiletto wood which is much used in dying. It grows naturally in the warmest parts of *America*, from whence the wood is imported for the dyers; and the demand for it has been so great, that there are no large trees left in any of the *British* colonies, the biggest scarce exceeding eight inches in diameter, and fifteen feet in height. It hath very slender branches, which are armed with recurved thorns. The leaves are winged, branching out into many divisions, garnished with small oval lobes which are indented at the top. The foot-

stalks of the flowers come out from the side of the branch, and are terminated by a loose pyramidal spike of white flowers, which are shaped somewhat like those of the butterfly kind.

The second sort grows naturally in the same countries with the first, but is of larger size: it sends out many weak irregular branches, armed with short strong upright thorns. The leaves branch out in the same manner as the first, but the lobes (or small leaves) are oval and entire. The flowers are produced in long spikes like those of the former, but are variegated with red.

These plants are propagated by seeds, which should be sown in small pots filled with light rich earth early in the spring, and plunged into a hot-bed of tanners bark. In about six weeks after, the plants will begin to appear, when they must be carefully cleared from weeds, and frequently refreshed with water; in warm weather the glasses of the hot-bed should be raised in the middle of the day, to admit fresh air to the plants. When the plants are two or three inches high, they should be carefully taken out of the pots, and each transplanted into a separate small pot, and plunged into the hot-bed again, observing to water them, and screen them from the heat of the sun, until they have taken new root; after which time, the glasses of the hot-bed should be raised every day, in proportion to the heat of the weather, to admit fresh air to the plants. In this hot-bed the plants may remain till autumn, when they should be removed into the stove, and plunged into the bark bed, where they may have room to grow. These plants being tender, should always be kept in the bark stove, and have a moderate share of heat in the winter; and being placed among other tender exotick plants of the same country, will afford an agreeable variety.

CAINITO. See Chrysoyllum.

CAKILE. See Rocket and Bunias.

CALAMINTHA. See Melissa.

CALCEOLUS, Ladies Slipper. See Cypripedium.

CALENDULA. *Lin. Gen. Plant.* 885. Marigold.

The Characters are,

It hath a compound radiated flower, the border or rays being composed of female florets, which are stretched out on one side like a tongue. The hermaphrodite flowers, which compose the disk, are tubulous and quinquesfid. The germen is situated under the petal. These flowers are barren; but the female flowers are each succeeded by one oblong incurved seed, with angular membranes.

The Species are,

1. CALENDULA foliis linearilanceolatis semiamplexicaulis, seminibus echinatis. Marigold with narrow spear-shaped leaves, half embracing the stalk, and prickly seeds; or, the least Marigold.

2. CALENDULA seminibus radii cymbiformibus echinatis, disci bicornibus. *Hort. Cliff.* 425. Marigold with boat-shaped prickly seeds in the border, and those in the center bicorned; or, Common Marigold.

3. CALENDULA foliis lanceolatis denticulatis, pedunculis filiformibus. *Hort. Upsal.* 274. Marigold with spear-shaped indented leaves, and slender foot-stalks.

4. CALENDULA foliis lanceolatis sinuato dentatis caule nudo. *Lin. Sp. Plant.* 922. Marigold with sinuated indented spear-shaped leaves, and a naked stalk.

5. CALENDULA foliis lanceolatis dentatis pedunculis superre incrassatis. *Hort. Cliff.* 274. Marigold with indented spear-shaped leaves, and the upper part of the foot-stalk swelling.

6. CALENDULA foliis linearibus subintegerrimis caule subnudo. *Lin. Sp. Plant.* 922. Marigold with narrow entire leaves, and a naked stalk.

7. CALENDULA foliis obversè ovatis denticulatis, caule fruticoso perenni. *Prod. Leyd.* 531. Marigold with obverse oval leaves which are indented, and a perennial shrubby stalk.

The

The first sort grows naturally in the south of *France, Spain, and Italy*; it rises with a slender branching stalk, which spreads near the ground, and is garnished with narrow, spear-shaped, hairy leaves, which half surround the stalk at their base; the flowers are produced at the extremity of the branches, upon long naked foot-stalks. These are very small, and of a pale yellow colour; the seeds are long, narrow, and on their outside armed with prickles. The root is annual, and perishes soon after the seeds are ripe. If the seeds of this plant are permitted to scatter, there will be a fresh supply of young plants.

The second sort is the common Marigold, which is cultivated for use in the gardens; this is so well known, as to require no description. Of this there are the following varieties; *the common single; the double flowering; the largest very double flower; the double Lemon coloured flower; the greater and smaller childing Marigold.*

These varieties are supposed to have been originally obtained from the seeds of the common Marigold; but these differences continue, if the seeds are properly saved; nor have I observed the common sort approaching to either of these, where they have been long cultivated in the greatest plenty; but as the two childing Marigolds, and the largest double, are subject to degenerate, where care is not taken in saving of their seeds, so I conclude they are not distinct species. The best way to preserve these varieties, is to pull up all those plants, whose flowers are less double, as soon as they appear, that they may not impregnate the others with their farina, and save the seeds from the largest and most double flowers; and the childing sort should be sown by itself, in a separate part of the garden, and the seeds saved from the large center flowers only.

The seeds of these may be sown in *March or April*, where the plants are to remain, and will require no other culture, but to keep them clean from weeds, and to thin the plants where they are too close, leaving them ten inches asunder, that their branches may have room to spread.

The third grows naturally at the *Cape of Good Hope*. This plant is annual, and perishes soon after the seeds are perfected.

The lower leaves are oblong, spear-shaped, and deeply indented on their edges. The stalks are produced on every side the root, which decline toward the ground, and are garnished with leaves from the bottom, to within two inches of the top. The upper part of the stalk is very slender, upon which rests one flower, shaped like those of the common Marigold, having a purple bottom; and the rays (or border) of the flower are of a Violet colour on their outside, and of a pure white within; these open when the sun shines, but shut up in the evening, and remain so in cloudy weather.

The fourth sort is a native of the *Cape of Good Hope*. This is also an annual plant, and has much the appearance of the former, but the leaves are more deeply indented on their edges; the stalks grow about the same length as the former; the flower is a little smaller, and the outside of the rays are of a fainter purple colour. The seeds of this are flat and heart-shaped, but those of the former are long and narrow.

The fifth sort was brought from the same country as the two former, and is also an annual plant; the leaves of this are much longer than those of either the former sorts, and broader at the end; they are regularly indented near the root, but those on the stalks have but few and shallow indentures. The stalks of this sort are much longer and thicker than those of the former; and at the top, just below the flower, swell larger than it is at bottom; the flower is smaller than those of the other sorts, but is of the same colour.

The seeds of these plants should be sown in the spring, in the borders of the garden, where the plants are designed to remain, for they do not bear transplanting well; therefore they may be treated in the same manner, and sown at the same time, with Candy Tuft, Venus Looking-glass, and other hardy annual plants, putting four or five seeds in each patch; if they all grow, there should not be more than two or three plants left; after this they require no farther care, but to keep them clean from weeds. If the seeds of these plants are permitted to scatter, the plants will come up the following spring without care, and these will flower earlier than those which are sown in the spring.

The sixth sort is also a native of the same country. This is a perennial plant, which divides near the root, into several tufted heads, which are closely covered with long grassy leaves, coming out on every side without order, and are for the most part entire. From between the leaves arise naked foot-stalks, about nine inches long, sustaining one flower at the top, which is about the size of the common Marigold, having a purple bottom; the rays are also purple without, but of a pure white within. These expand when the sun shines, but always close in the evening, and in cloudy weather. This sort doth not often produce good seeds in *Europe*, but it is easily propagated by slips taken off from the heads, in the same manner as is practised for Thrift. They may be planted any time in summer, in a shady border, covering them close with a Melon glass. After they have got strong roots, they should be each planted into separate small pots, filled with fresh light earth, and placed in a shady situation, till they have taken fresh root, when they may be placed in the open air, in a sheltered situation, where they may remain till autumn, and then should be placed in a dry airy glass case, for the winter season, or under a common hot-bed frame; for they only require protection from frost and wet, and should enjoy the air at all times when the weather is mild.

The seventh sort hath been of late years introduced from the *Cape of Good Hope*. It hath a slender, shrubby, perennial stalk, which rises to the height of seven or eight feet, but requires support; this sends out a great number of weak branches, from the bottom to the top, which hang downward, unless they are supported; they are garnished with oval leaves, having short flat foot-stalks; they are of a shining green colour on their upper side, but paler underneath; the flowers come out at the end of the branches, on short naked foot-stalks, and are in size and colour like those of the fifth sort.

This is easily propagated by cuttings, which may be planted any time in summer in a shady border, or otherwise shaded with mats in the heat of the day: in five or six weeks, these will have taken root, when they should be carefully taken up, and each put into a separate pot, and placed in the shade till they have taken fresh root; then they may be placed with other hardy exotick plants in a sheltered situation, where they may remain till the frost begins, when they must be removed into the green-house, placing them near the windows that they may enjoy the free air, for this plant only requires protection from frost.

CALF'S-SNOUT. See Antirrhinum.

CALLA. *Lin. Gen. Plant.* 917. Wake Robin, or *Ethiopian Arum*.

The Characters are,

It hath a large open spathe of one leaf, coloured and permanent. It hath a single upright spadix, to which the flowers and fruit adhere. This hath male and female flowers, intermixed toward the upper part of the club, or spadix. The male flowers consist of many very short stamina; the female flowers have a compressed style, resting upon an obtuse germen, which after-ward becomes a globular pulpy fruit, compressed on two sides, inclosing two or three obtuse seeds.

We have but one *Species* of this genus in the gardens, viz.

CALLA foliis sagitato-cordatis, spathâ cucullatâ, spadice superne masculo. Hort. Cliff. 436. Calla with arrow-headed heart-shaped leaves, a hooded spatha or sheath, and male flowers situated on the upper part of the spadix.

This plant hath thick fleshy tuberous roots, which are covered with a thin brown skin, and strike down many strong fleshy fibres into the ground. The leaves have foot-stalks more than a foot long, which are green and succulent. The leaves are shaped like the point of an arrow, they are eight or nine inches in length, ending in a sharp point, which turns backward; between the leaves arises the foot-stalk of the flower, which is thick, smooth, of the same colour as the leaves, and rises above them, and is terminated by a single flower, shaped like those of the Arum, the hood or spatha being twisted at the bottom, but spreads open at the top, and is of a pure white colour. When these fade, part of those which are situated at the top of the club, are succeeded by roundish fleshy berries compressed on two sides, each containing two or three seeds.

This plant grows naturally at the *Cape of Good Hope*. It propagates very fast by offsets, which should be taken off the latter end of *August*, at which time the old leaves decay; for at this season the roots are in their most inactive state. These roots have generally a great number of offsets about them, so that unless there is a want of them, the largest only should be chosen, which should be separated from all the smaller, and each planted in a separate pot, and placed with other hardy exotick plants in the open air till autumn, when they must be removed into shelter for the winter season. This plant is so hardy as to live in the open air in mild winters, without any cover, if they are planted in warm borders, and have a dry soil; but with a little shelter in hard frost, they may be preserved in full growth very well.

CALLACARPA. See *Johnsonia*.

CALTHA. Lin. Gen. Plant. 623. Marsh Marigold.

The Characters are,

The flower is composed of five large oval petals which are concave; it hath a great number of slender stamina. In the center there are several oblong compressed germen situated, which afterward become so many short pointed capsules, containing many roundish seeds.

We have but one *Species* of this genus, viz.

CALTHA foliis orbiculatis crenatis, flore majore. Marsh Marigold with round crenated leaves, and a larger flower.

This plant grows upon moist boggy land, in many parts of *England*; of this there is a variety, with very double flowers, which for its beauty is preserved in gardens, and is propagated by parting of the roots in autumn. It should be planted in a moist soil, and a shady situation; and as there are often such places in gardens, where few other plants will thrive, so these may be allowed to have room, and during their season of flowering, will afford an agreeable variety.

CAMARA. See *Lantana*.

CAMERARIA. Plum. Nov. Gen. 18.

The Characters are,

The flower is of one leaf, salver-shaped, and divided at the top into five acute segments; it hath five short inflexed stamina. In the bottom of the tube are situated two roundish germen, which afterward become two long, taper, leafy capsules, filled with oblong cylindrical seeds.

The Species are,

1. *CAMERARIA foliis subrotundis, utrinque acutis.* Hort. Cliff. 76. Cameraria with roundish leaves ending in points.

2. *CAMERARIA foliis linearibus.* Lin. Sp. Pl. 210. Cameraria with very long narrow leaves.

The first sort was sent me from the *Havanna*, where it grows naturally in great plenty. This rises with a shrubby

stalk, to the height of ten or twelve feet, dividing into several branches, which are garnished with roundish pointed leaves placed opposite. The flowers are produced at the end of the branches in loose clusters, which have long tubes enlarging gradually upward, and at the top are cut into five segments, broad at their base, but end in sharp points: the flower is of a yellowish white colour.

The second sort hath an irregular shrubby stalk, which rises about eight feet high, sending out many branches, which are garnished with very narrow, thin leaves placed opposite at each joint. The flowers are produced scatteringly at the end of the branches, which are shaped like those of the former sort, but smaller. Both these plants abound with an acrid milky juice like the Spurge. The second sort grows naturally in *Jamaica*.

These plants are propagated by seeds, which must be procured from the places of their growth. They may also be propagated by cuttings planted in a hot-bed during the summer months: they must have a bark stove, for they are very tender plants; but in warm weather must have plenty of air.

CAMPANULA. Tourn. Inst. R. H. 108. Tab. 38. Bell-flower.

The Characters are,

The flower is of one leaf shaped like a bell, spreading at the base. In the bottom is situated the five-cornered nectarium, which is joined to the top of the receptacle; it hath five short stamina. Below the receptacle is situated the angular germen; the empalement afterward becomes a roundish angular capsule, which in some species have three, and in others five cells, each having a hole toward the top, through which the seeds are scattered when ripe.

The Species are,

1. *CAMPANULA foliis ovatis glabris subserratis, - caule erecto paniculato, ramulis brevibus.* Bell-flower with oval, smooth leaves sawed below, an upright paniculated stalk, and short branches.

2. *CAMPANULA foliis radicalibus obovatis, caulibus lanceolato-linearibus subserratis sessilibus remotis.* Lin. Sp. Plant. 164. Peach-leaved Bell-flower.

3. *CAMPANULA capsulis quinquelocularibus testis, calycis sinibus reflexis.* Vir. Cliff. 16. Garden Bell-flower with an oblong leaf and flower, commonly called *Canterbury Bell-flower*.

4. *CAMPANULA caule angulato, foliis petiolatis, calycibus ciliatis, pedunculis trifidis.* Vir. Cliff. 16. Greater and rougher Bell-flower with Nettle leaves.

5. *CAMPANULA foliis ovato-lanceolatis, caule simplicissimo tereti, floribus solitariis pedunculatis fructibus cernuis.* Vir. Cliff. 17. Greatest Bell-flower with broadest leaves.

6. *CAMPANULA foliis undulatis radicalibus lanceolato-ovalibus, paniculâ coarctatâ.* Hort. Upsal. 40. Bell-flower with an esculent root, commonly called *Rampion*.

7. *CAMPANULA caule angulato simplici, floribus sessilibus capitulo terminali.* Vir. Cliff. 16. Meadow Bell-flower with flowers gathered in bunches.

8. *CAMPANULA caule ramosissimo diffuso foliis oblongis subcrenatis, calycibus solitariis corollâ longioribus, capsulis prismaticis.* Hort. Upsal. 41. Upright Field Bell-flower with yellow Eye-bright leaves.

9. *CAMPANULA caule ramoso foliis ovatis sessilibus, floribus pedunculatis terminatricibus.* Upright Field Bell-flower, or *Venus Looking-glass*.

10. *CAMPANULA caule basi subramoso stricto, foliis oblongis crenatis, calycibus aggregatis corollâ longioribus, capsulis prismaticis.* Lin. Sp. Pl. 168. Least upright Field Bell-flower, or small *Venus Looking-glass*.

11. *CAMPANULA caule dichotomo, foliis sessilibus utrinque dentatis.* Hort. Cliff. 65. Smaller annual Bell-flower with cut leaves.

12. *CAMPANULA caule subdiviso ramosissimo, foliis linearibus acuminatis.* Hort. Cliff. 66. Five-cornered Bell-flower of Thrace, with a very large flower.

13. *CAMPANULA caule simplici, foliis cordatis dentatis amplexicaulibus, floribus sessilibus aggregatis.* Hort. Upsal. 40. Five-cornered perfoliate Bell-flower.

14. *CAMPANULA caule ramoso, foliis linguiformibus crenulatis margine cartilagineo.* Prod. Leyd. 246. Smaller American Bell-flower with stiff leaves, and a blue spreading flower.

15. *CAMPANULA foliis hastatis dentatis oppositis petiolatis, capsulis quinquelocularibus.* Lin. Sp. Plant. 168. Canary Bell-flower, with an Orach leaf and a tuberous root.

There are several other species of this genus, some of which grow naturally in *England*, and others in the northern parts of *Europe*, which have but little beauty, therefore are seldom cultivated in gardens, so I shall not enumerate them here. There are also several varieties of some of the sorts here mentioned, which I shall take notice of in their proper place; but as they are not distinct species, so I have omitted them in the above list.

The first sort hath thick tuberous roots which are milky; this sends out strong, smooth, upright stalks, which rise four feet high, garnished with smooth oblong leaves, whose edges are a little indented. The flowers are produced from the side of the stalks, and are regularly set on for more than half their length, forming a sort of pyramid; these are large, open, and shaped like a bell. The most common colour of the flowers is a light blue; but there have been some with white flowers, which make a variety when intermixed with the blue, but the latter is most esteemed.

This plant is cultivated to adorn halls, and to place before chimnies in the summer, when it is in flower, for which purpose there is no plant more proper; for when the roots are strong, they will send out four or five stalks, which will rise as many feet high, and are garnished with flowers great part of their length. When the flowers begin to open, the pots are removed into the rooms, where, being shaded from the sun, and kept from the rain, the flowers will continue long in beauty; and if the pots are every night removed into a more airy situation, but not exposed to heavy rains, the flowers will be fairer, and continue much longer in beauty.

Those plants which are thus treated, are seldom fit for the purpose the following season, therefore a supply of young plants should be annually raised. The common method of propagating this plant, is by dividing the roots. The best time for doing this is in *September*, that the offsets may have time to get strong roots before winter.

This method of propagating by the offsets is the quickest, therefore generally practised; but the plants which are raised from seeds are always stronger, and the stalks will rise higher, and produce a greater number of flowers, therefore I recommend it to the practice of the curious; but in order to obtain good seeds, there should be some strong plants placed in a warm situation, near a pale, or wall, in autumn; and, if the following winter should prove severe, they should be covered either with hand glasses or mats, to prevent their being injured by the frost; and, in the summer, when the flowers are fully open, if the season should prove very wet, the flowers must be screened from great rains, otherwise there will be no good seeds produced: the not observing this, has occasioned many to believe that the plants do not bear seeds in *England*, which is a great mistake, for I have raised great numbers of the plants from the seeds of my own sowing; but I have always found that the plants which have been long propagated by offsets, do seldom produce seeds, which is the same with many other plants which are propagated by slips or cuttings, which in a few years become barren.

When the seeds are obtained, they must be sown in autumn in pots, or boxes, filled with light undunged earth, and placed in the open air till the frost, or hard rains come on, when they should be placed under a hot-bed frame, where they may be sheltered from both; but in mild weather the glasses should be drawn off every day, that they may enjoy the free air; with this management the plants will come up early in the spring, and then they must be removed out of the frame, placing them first in a warm situation; but when the season becomes warm, they should be removed where they may have the morning sun only. In *September* the leaves of the plants will begin to decay, at which time they should be transplanted; therefore there must be one or two beds prepared, in proportion to the number of plants. These beds must be in a warm situation, and the earth light, sandy, and without any mixture of dung, which last is an enemy to this plant. If the situation of the place is low, or the natural soil moist, the beds must be raised five or six inches above the surface of the ground, and the natural soil removed a foot and an half deep, putting lime rubbish or stones, eight or nine inches thick in the bottom of the trench, to drain off the moisture. When the beds are prepared, the plants must be taken out of the pots or cases, very carefully, so as not to break or bruise their roots, for they are very tender, and, on being broken, the milky juice will flow out plentifully, which will greatly weaken them. These should be planted at about six inches distance each way, with the head, or crown of the root, half an inch below the surface; if there happens a gentle shower of rain soon after they are planted, it will be of great service to the plants, but as the season sometimes proves very dry at this time of the year, so, in that case, it will be proper to give them a gentle watering three or four days after they are planted, and to cover the beds with mats every day, to prevent the sun from drying the earth, but these must be taken off in the evening, that the dew may fall on the ground. Towards the end of *November* the beds should be covered over with some old tanners bark to keep out the frost, and where there is not conveniency of covering them with frames, they should be arched over with hoops, that in severe frosts they may be covered with mats, for these plants, when young, are often destroyed in winter, where this care is wanting. In the spring the coverings must be removed, and the following summer the plants must be kept clean from weeds. The following autumn the surface of the ground should be stirred between the plants, and some fresh earth spread over the beds, and in the winter covered as before. In these beds the plants may remain two years, during which time they must be treated in the manner before directed, by which time the roots will be strong enough to flower, so in *September* they should be carefully taken up, and some of the most promising planted in pots; the others may be planted into warm borders, or in a fresh bed, at a greater distance than before, to allow them room to grow. Those plants which are potted should be sheltered in winter from great rains and hard frosts, otherwise they will be in danger of rotting, or at least will be so weakened, as not to flower with any strength the following summer; and those which are planted in the full ground, should have some old tanners bark laid round them, to prevent the frost from entering deep to the roots; with this management these plants may be brought to the utmost perfection, and a constant succession of good roots raised, which will be much preferable to those which are propagated by offsets.

The second sort grows naturally in the northern parts of *Europe*. Of this there are the following varieties, viz. the single blue, and white flower, which have been long here; and the double flower of both colours, which have not been more than thirty years in *England*, but have been propagated in such plenty, as to have almost banished those with single flowers from

from the gardens. All these varieties are easily propagated by parting of their roots in autumn, every head which is then slipped off will take root; they are extreme hardy, so will thrive in any soil or situation, therefore are very proper furniture for the common borders of the flower garden.

The third sort is a biennial plant, which perishes soon after it hath ripened seeds. It grows naturally in the woods of *Italy* and *Austria*, but is cultivated in the *English* gardens for the beauty of its flowers. Of this sort there are the following varieties, the blue, the purple, the white, the striped, and double flowering.

This hath oblong, rough, hairy leaves, which are serrated on their edges: from the center of these a stiff, hairy, furrowed stalk, arises about two feet high, sending out several lateral branches, which are garnished with long, narrow, hairy leaves, sawed on their edges: from the setting on of these leaves, come out the foot-stalks of the flower; those which are on the lower part of the stalk and branches, being four or five inches long, diminishing gradually in their length upward, and thereby form a sort of pyramid. The flowers of this kind are very large, so make a fine appearance. The seeds ripen in *September*, and the plants decay soon after.

It is propagated by seeds, which must be sown in the spring, on an open bed of common earth, and when the plants are fit to remove, they should be transplanted into the flower nursery, in beds six inches asunder; and the following autumn, they should be transplanted into the borders of the flower garden. As these plants decay the second year, so there should be annually young ones raised to succeed them.

The fourth sort hath a perennial root, which sends up several stiff hairy stalks, having two ribs, or angles. These put out a few short side branches, garnished with oblong pointed leaves, which are hairy, and deeply sawed on their edges. Toward the upper part of the stalks, the flowers come out alternately, upon short trifid foot stalks, having hairy empalements.

The varieties of this are, the deep and pale blue; the white with single flowers, and the same colours with double flowers. The double sorts are propagated by parting of their roots in autumn, which should be annually performed, otherwise the flowers are apt to degenerate to single. The soil should not be too light or rich in which they are planted, for in either of these they will not produce double flowers. The plants are extreme hardy, and may be planted in any situation; those with single flowers do not merit a place in gardens.

The fifth sort grows naturally in the northern parts of *England*; this hath a perennial root, composed of many fleshy fibres, that abound with a milky juice, from which arise several strong, round, single stalks, which never put out branches, but are garnished with oval spear-shaped leaves, slightly indented on their edges. Toward the upper part of the stalk, the flowers come out singly upon short foot-stalks. After the flowers are past, the empalement becomes a five-cornered seed vessel, which turns downward till the seeds are ripe, when it rises upward again.

The varieties of this are the blue, purple, and white flowering. This sort is easily propagated by seeds, which it furnishes in great plenty, and, if suffered to scatter, the plants will come up in as great plenty the following spring, when they may be transplanted into the nursery till autumn, at which time they should be transplanted where they are designed to remain.

The sixth sort hath roundish fleshy roots, which are eatable, and are much cultivated in *France* for sallets; and some years past it was cultivated in the *English* gardens, but is now generally neglected. It grows naturally in several parts of *England*, but those roots never grow to half the size of those

which are cultivated. This is propagated by seeds, which should be sown in a shady border, and when the plants are about an inch high, the ground should be hoed, as is practised for Onions, to cut up the weeds, and thin the plants to the distance of three or four inches; and when the weeds come up again, they must be hoed over to destroy them; this, if well performed in dry weather, will make the ground clean for a considerable time, so that being three times repeated, it will keep the plants clean till the winter, which is the season for eating the roots, when they may be taken up for use as they are wanted. These will continue good till *April*, at which time they will send out their stalks, when they will become hard and unfit for use.

The seventh sort grows naturally upon chalky pastures in many parts of *England*, where the stalks do not rise many times a foot high, and in other places it grows to double that height, which has occasioned their being taken for two distinct plants. This hath a perennial root, which sends up several round hairy stalks, which rise upward of two feet high; the bottom leaves are broad, and stand upon long foot-stalks. Those which are upon the stalks are long, narrow, have no foot-stalks, and are placed alternately at considerable distances. From the wings of the leaves, towards the upper part of the stalk, come out long naked foot-stalks, supporting two or three bell-shaped flowers, closely joined together in a head, and the main stalk is terminated by a large cluster of the same flowers, which are succeeded by roundish capsules filled with small seeds. This plant is easily propagated, either by seeds or parting of the roots, and will thrive in any soil or situation.

The eighth sort is an annual plant, which rises with slender stalks a foot high, branching out on every side, garnished with oblong leaves, a little curled on their edges; from the wings of the leaves come out the flowers, sitting close to the stalks, which are of a beautiful purple, inclining to a Violet colour. In the evening they contract and fold into a pentagonal figure, from whence it is by some titled *Viola Pentagonia*, or five-cornered Violet. If this plant is sown in autumn, it will grow much taller, and flower a month earlier than when the seeds are sown in the spring. The autumnal plants will flower in *May*, and the spring plants in *June* and *July*.

The ninth sort is the common Venus Looking-glass. This sort seldom rises more than six inches high, with a stalk branching from the bottom upward, and garnished with oval leaves, sitting close to the stalks, from the base of which the branches are produced, which are terminated by flowers, very like those of the former sort.

The tenth sort grows naturally in *England*, in arable land; this sends out an upright stalk, about six or seven inches high, and near the root there are a few lateral branches, which are weak, and spread out on every side. These are garnished with oval obtuse leaves, which are slightly indented on their edges, placed alternately. At the extremity of the branches the flowers are produced in clusters, which are small, but of the same shape with the former, having a five leaved empalement, much longer than the petal; the seed-vessel is shaped like those of the two former, but are smaller.

The eleventh sort grows naturally in the south of *France* and *Italy*. This is also a low annual plant, which seldom rises six inches high, but divides into many branches, which are garnished with short oval leaves, sitting close to the branches. The flowers are produced at the ends of the branches, which are shaped like those of the other three sorts last mentioned, but they are small, and their colour less beautiful, and the leaves of the empalement are broader.

The twelfth sort grows naturally in *Thrace*. This is also a low annual plant, which rises little more than six
P inches

inches high; the stalks divide by pairs, and frequently there arises a branch from the middle of the divisions; the lower leaves are oblong and obtuse, but those which come out toward the end of the branches are much narrower, and pointed. The flowers come out single at the end of the branches, having a long five-leaved empalement, and are larger than those of the three last sorts, and of a fine blue colour.

The ninth sort is the old Venus Looking-glass, which was formerly cultivated in the gardens, but since the eighth sort hath been introduced, it hath almost supplanted the other; for the eighth is a much taller plant, and the flowers are larger, but their colour is less beautiful; however it produces a greater quantity of seeds, so is to be had in plenty, and there are few persons that are curious enough to distinguish them.

If these, and the Venus Navelwort, Dwarf Lychnis, Candy Tuft, and other low annual flowers, are properly mixed in the border of the flower garden, and sown at two or three different seasons, to have a succession of them in flower, they will afford an agreeable variety. If these seeds are sown in autumn, the plants will flower early in spring, but those which are sown in the spring, will not flower till the middle of *June*; and if a third sowing is performed about the middle of *May*, the plants will flower in *August*, but from the last sowing, good seeds must not be expected.

The thirteenth sort is an annual plant, which in good ground will rise a foot and an half, but in poor land, or where it grows wild among Corn, scarcely rises to the height of six inches. The stalk is single, rarely putting out any branches, unless near the root. The leaves are roundish, and embrace the stalk at their base; their edges are sharply sawed, and from their base comes out a close tuft of flowers, surrounded by the leaf, as in an empalement. The flowers are five-cornered, shaped like those of the Venus Looking-glass, but are much smaller; these are produced the whole length of the stalk. The seeds are inclosed in short capsules, which are shaped like those of the former sorts. If the seeds of this sort are permitted to scatter, the plants will come up without care; or the seeds may be sown in the spring, in the same manner as those of the last sorts, and treated in the same way.

The fourteenth sort is a native of *America*. This hath many rigid oblong leaves coming out from the root on every side, which form a sort of head like those of House-leek, and are crenated, having a strong rib running on their border longitudinally. From the center of the plant proceeds the stalk, which rises about a foot high, and is thinly garnished with very narrow stiff leaves, of a shining green. From the wings of the leaves come out the foot-stalks of the flower, which are from two to four inches long, each being terminated by one spreading bell-shaped flower, whose empalement is short, and cut into five acute segments. There is a white and a blue flower of this sort in the gardens, and in *Holland* they have it with a double flower. This sort doth not produce seeds in *England*, so is only propagated by offsets; which may be taken off from the old plants in *August*, that they may get good root before the cold weather begins; they must be planted in small pots, and placed in the shade until they have taken root, then they may be placed with other hardy exotick plants, and in autumn some of them should be removed into shelter; for in severe frosts, those in the open air are often killed.

The fifteenth sort is a native of the *Canary Islands*. This hath a thick fleshy root, which is of an irregular form, sometimes running downward like a Parsnep, at other times dividing into several knobs near the top, and when any part of the root is broken, there issues out a milky juice at the

wound. From the head, or crown of the root, arises one, two, three, or more stalks, in proportion to the size of the root; but that in the center is generally larger, and rises higher than the others. These stalks are very tender, round, and of a pale green; their joints are far distant from each other, and when the roots are strong, the stalks will rise ten feet high, sending out several smaller side branches. At each joint they are garnished with two, three, or four spear-shaped leaves, with a sharp pointed beard on each side. These are of a sea-green, and, when they first come out, are covered slightly with an Ash-coloured pounce. From the joints of the stalk the flowers are produced, which are of the perfect bell-shape, and hang downward; they are of a flame colour, marked with stripes of a brownish red; the flower is divided into five parts, at the bottom of each is situated a nectarium, covered with a white transparent skin, much resembling those of the Crown Imperial, but are smaller. In the center of the flower is situated the style, which is longer than the stamina, and is crowned by a trifid stigma, which is reflexed. The flowers begin to open in the beginning of *October*, and there is often a succession of them till *March*. The stalks decay to the root in *June*, and new ones spring up in *August*.

It is propagated by parting of the roots, which must be done with caution; for if they are broken or wounded, the milky juice will flow out plentifully, so that if these are planted before the wounds are skinned over, it occasions their rotting; therefore whenever any of them are broken, they should be laid in the green-house a few days to heal. These roots must not be too often parted, especially if they are expected to flower well; for by frequent parting, the roots are weakened. The best time for transplanting and parting of their roots, is in *July*, soon after the stalks are decayed. The earth in which these should be planted, must not be rich, for that will cause them to be luxuriant in branches, and but thinly garnished with flowers. The soil in which they have succeeded best, is a light sandy loam, mixed with a fourth part of screened lime rubbish; when the roots are first planted, the pots should be placed in the shade; and, unless the season is very dry, should not be watered, for during the time they are inactive, wet is very injurious to them. About the middle of *August* the roots will begin to put out fibres, at which time, if the pots are placed under a hot-bed frame, and as the nights grow cool, covered with the glasses, but opened every day to enjoy the free air, it will greatly forward them for flowering, and increase their strength; when the stalks appear, the plants must be now and then refreshed with water, which must not be given too often, nor in great quantity. The plants thus managed, by the middle of *September* will have grown so tall, as not to be kept longer under the frame, so they should be removed into a dry airy glass case, where they may enjoy the free air in mild weather, but screened from cold. During the winter season, they must be frequently refreshed with water, and guarded from frost; and in the spring, when the stalks begin to decay, the pots should be set abroad in the shade, and not watered.

CAMPHORA. See *Laurus*.

CAMPION. See *Lychnis*.

CANDLE-BERRY-TREE. See *Myrica*.

CANDY-TUFT. See *Iberis*.

CANNA. *Lin. Gen. Pl.* 1. *Indian Cane*.

The Characters are,

The flower hath one petal, which is divided into six parts: the three upper segments are erect, and broader than the lower, two of which are erect, and the other turns back and is twisted. It hath one spear-shaped stamina rising as high as the petal, having the appearance of a segment. Below the empalement is situated a roundish, rough germen, which becomes an oblong, roundish, membranaceous

branaceous capsule, having three longitudinal furrows, crowned by the empalement, which hath three cells filled with round smooth seeds.

The Species are,

1. *CANNA foliis ovatis utrinque acuminatis nervosis. Prod. Leyd.* 11. Common broad-leaved flowering Cane.

2. *CANNA foliis ovatis obtusis nervosis, spicis florum longioribus. Indian* flowering Cane, with a pale red flower.

3. *CANNA foliis lanceolatis petiolatis nervosis. Prod. Leyd.* 11. *Indian* Cane with glaucous leaves, a very large flower, and the appearance of the Marsh Iris.

The first grows naturally in both *Indies*: the inhabitants of the *British* islands in *America* call it *Indian Shot*, from the roundness and hardness of the seeds.

This plant hath a thick, fleshy, tuberous root, which divides into many irregular knobs, it sends out many large oval leaves without any order; these, at their first appearance, are twisted like a horn, but afterwards expand and are near a foot long, and five inches broad in the middle, lessening gradually to both ends, and terminated in a point. The stalks are herbaceous, rising four feet high, and are encompassed by the broad leafy foot-stalks of the leaves; at the upper part of the stalk, the flowers are produced in loose spikes, each being at first covered by a leafy hood, which afterward stands below the flower, and turns to a brown colour. The flower is encompassed by a three-leaved empalement, which sits upon a small, roundish, rough germen, which, after the flower is fallen, swells to a large fruit or capsule, oblong, rough, and is crowned by the three-leaved empalement of the flower which remains. When the fruit is ripe, the capsule opens lengthways into three cells, which are filled with round, hard, black, shining seeds.

As this sort is a native of the warmest parts of *America*, so it requires to be placed in a moderate stove in winter, where they always flower in that season, at which time they make a fine appearance; and in the summer, place them abroad in a sheltered situation with other tender exotick plants, where they flower again, and produce ripe seeds annually.

The second sort grows naturally in *Carolina*, and some of the other northern provinces of *America*. The leaves of this sort are longer than those of the former, and terminate in sharper points. The stalks grow taller, and the segments of the flower are much narrower; the colour is a pale red, so it makes no great appearance. The seeds are like those of the former sort. If the roots of this sort are planted in warm borders and a dry soil, they will live through the winter in the open air without cover, and flower well every year.

The seeds of the third sort I received from *Carthage* in *New Spain*, in the year 1733, which produced very strong plants the first year, some of which flowered the same autumn. The roots of this are much larger than either of the former sorts, and strike down strong fleshy fibres deep in the ground. The stalks rise seven or eight feet high. The leaves are near two feet long, narrow, smooth, and of a sea-green colour. The flowers are produced in short thick spikes at the extremity, which are large, and of a pale yellow colour; the segments of the petal are broad, but their shape like those of the other sorts. The seed vessels are larger, and much longer than those of the other sorts, but contain fewer seeds, which are very large.

All the sorts are propagated by seeds, which should be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be transplanted into separate small pots, and plunged into a moderate hot-bed of tanners bark, observing to shade them till they have taken root; after which, they should have a large share of free air admitted to them every day, in warm weather. As these plants will make great progress in their growth, so they must be shifted into larger pots, and part of them plunged into the hot-

bed again; the others may be placed abroad in *June*, with other exotick plants, in a warm situation. Those which are placed in the hot-bed, will be strong enough to flower well in the stove the following winter; but those in the open air, will not flower before the following summer: these may remain abroad till the beginning of *October*, when they must be removed into the stove, and treated in the same manner as the old plants. These plants will continue many years with proper management, but as young plants always flower better than the old roots, so it is scarce worth while to continue them after they have borne good seeds.

The second sort which is much hardier than either of the other, should have a different treatment. The young plants of this must be earlier inured to the open air, where they may remain till the frost begins; then they must be placed in the green-house, and should have but little wet in winter; and the beginning of *May*, these should be turned out of the pots, and planted in a warm south border, in a dry soil, where they will thrive and produce flowers annually. There is a variety of this with variegated leaves, which is preserved in some gardens, and is propagated by parting of the roots; but this hath little beauty, so is scarce worth cultivating.

CANNABINA. See *Datisca*.

CANNABIS, Hemp.

The Characters are,

It is male and female in different plants. The male flowers have no petals; they have five short hairy stamina, terminated by oblong square summits. The female flowers have no petals but a small germen, which afterward becomes a globular depressed seed, inclosed in the empalement.

We have but one Species of this plant, viz.

CANNABIS. *Lin. Sp. Plant.* 1027. Hemp.

This plant is propagated in the rich fenny parts of *Lincolnshire*, in great quantities, for its bark, which is useful for cordage, cloth, &c. and the seeds afford an oil, which is used in medicine.

Hemp is always sown on a deep moist rich soil, such as is found in *Holland*, in *Lincolnshire*, and the fens in the isle of *Ely*, where it is cultivated to great advantage; as it might in many other parts of *England*, where there is the like soil; but it will not thrive on clay, or stiff cold land: it is esteemed very good to destroy weeds, which is no other way effected, but by robbing them of their nourishment, for it will greatly impoverish the land, so that this crop must not be repeated on the same ground.

The land on which Hemp is designed to be sown, should be well ploughed, and made very fine by harrowing; about the middle of *April* is a good season for sowing of the seed: three bushels is the usual allowance for an acre, but two is fully sufficient: in the choice of the seed, the heaviest and brightest coloured should be preferred, and particular care should be had to the kernel of the seed, so that some of them should be cracked to see if they have the germ or future plant perfect; for in some places the male plants are drawn out too soon from the female, *i. e.* before they have impregnated the female plants with the farina; in which case, though the seeds produced by these female plants may seem fair to the eye, yet they will not grow, as is well known to the inhabitants of *Bickar*, *Swineshead*, and *Dunnington*, three parishes in the fens of *Lincolnshire*, where Hemp is cultivated in great abundance, who have dearly bought their experience.

When the plants are come up, they should be hoed out in the same manner as is practised for Turneps, leaving them two feet apart; observe also to cut down all the weeds, which if well performed, and in dry weather, will destroy them. This crop will require a second hoeing about six weeks after the first, in order to destroy the weeds: if this

be well performed, it will require no farther care; for the Hemp will soon after cover the ground, and prevent the growth of weeds.

The first season for pulling the Hemp is usually about the middle of *August*, when they begin to pull what they call the Fimble Hemp, which is the male plants; but it would be much the better method to defer this a fortnight or three weeks longer, until these male plants have fully shed their dust, without which, the seeds will prove abortive, produce nothing if sown the next year, nor will those concerned in the oil mills give any thing for them, there being only empty husks, without any kernels to produce the oil. These male plants decay soon after they have shed their farina.

The second pulling is a little after *Michaelmas*, when the seeds are ripe: this is usually called Karle Hemp, it is the female plants, which were left at the time when the male were pulled. This Karle Hemp is bound in bundles of a yard compass, according to statute measure, which are laid in the sun for a few days to dry; and then it is stacked up, or housed to keep it dry, till the seed can be threshed out. An acre of Hemp on a rich soil, will produce near three quarters of seed, which, together with the unwrought Hemp, is worth from six to eight pounds.

CANNACORUS. See *Canna*.

CAPERS. See *Capparis*.

CAPNOIDES. See *Fumaria*.

CAPNORCHIS. See *Fumaria*.

CAPPARIS. *Lin. Gen. Plant.* 567. The Caper Bush.

The Characters are,

The flower hath four large roundish petals; it hath a great number of slender stamina. In the midst of these arise a single style longer than the stamina, with an oval germen, which afterward becomes a fleshy turbinated capsule with one cell, filled with kidney-shaped seeds.

The Species are,

1. CAPPARIS *aculeata*. *Hort. Cliff.* 203. Prickly Caper.
2. CAPPARIS *inermis foliis ovatis perennantibus*. Smooth Caper with oval leaves, which remain all the year.
3. CAPPARIS *inermis foliis ovato-oblongis determinatè confertis perennantibus*. *Hort. Cliff.* 201. Smooth Caper with oval oblong leaves, growing in clusters, which continue through the year.
4. CAPPARIS *foliis lanceolato-ovatis perennantibus caule arborescenti*. Caper with oval spear-shaped leaves, which continue through the year, and a tree-like stalk.
5. CAPPARIS *foliis lanceolatis venosis perennantibus, floribus racemosis*. Caper with spear-shaped veined leaves which continue through the year, and flowers growing in bunches.
6. CAPPARIS *foliis ovatis oppositis perennantibus floribus racemosis*. Caper with oval leaves placed opposite, which continue through the year, and flowers growing in bunches.
7. CAPPARIS *foliis oblongo ovatis alternis sessilibus perennantibus, floribus solitariis axillaribus*. Caper with oblong oval leaves, placed alternate close to the stalks, which continue through the year, and flowers growing singly from the sides of the branches.
8. CAPPARIS *foliis lanceolatis acutis confertis perennantibus, caule fruticoso*. Caper with pointed spear shaped leaves, growing in clusters, which continue through the year, and a shrubby stalk.
9. CAPPARIS *foliis lanceolatis alternis, petiolis longissimis floribus confertis*. Caper with spear-shaped leaves placed alternate, on very long foot-stalks, and flowers growing in clusters.
10. CAPPARIS *foliis lanceolatis nervosis perennantibus, pedunculis trifloris*. Caper with nervous spear-shaped leaves, which continue through the year, and three flowers upon each foot-stalk.

The first is the common Caper, whose full grown flower bud is pickled, and brought to *England* annually from *Italy*,

and the *Mediterranean*. This is a low shrub, which generally grows out of the joints of old walls, the fissures of rocks, and amongst rubbish, in most of the warm parts of *Europe*: it hath woody stalks, which send out many lateral slender branches; under each of these are placed two short crooked spines, between which and the branches come out the foot-stalk of the leaves, which are single, short, and sustain a round smooth entire leaf; at the intermediate joints between the branches, come out the flowers upon long foot-stalks; before these expand, the bud, with the empalement, is gathered for pickling; but those which are left expand in form of a single Rose, having five large white petals, which are roundish and concave; in the middle is placed a great number of long stamina, surrounding a style, which rises above them, and is crowned with an oval germen, which afterward becomes a capsule, filled with kidney-shaped seeds.

This sort is cultivated upon old walls about *Toulon*, and in several parts of *Italy*. Mr. Ray observed it growing naturally on the walls and ruins at *Rome*, *Sicenna*, and *Florence*.

The second sort hath weaker stalks than the first, which are smooth, having no spines on them; the leaves are oval, smooth, and in their natural place of growth, continue through the year; but in *England* the young shoots are generally killed in winter. From the foot-stalk of the leaves come out the flowers, which stand upon very long foot-stalks, and are produced singly; these flowers are like those of the former, but are much larger, as are also the buds; but these are not esteemed so good as those of the first for pickling.

These plants are with difficulty preserved in *England*, for they delight to grow in crevices of rocks, and the joints of old walls or ruins, and always thrive best in an horizontal position, so that when they are planted either in pots or the full ground, they rarely thrive, though they may be kept alive for some years. They are propagated by seeds in the warm parts of *Europe*, but it is very difficult to get them to grow in *England*. There is an old plant growing out of a wall in the gardens at *Cambden House*, near *Kensington*, which has resisted the cold for many years, and annually produces many flowers, but the young shoots of it are generally killed to the stump every winter.

The roots of these plants are annually brought from *Italy*, by the persons who import Orange trees, some of which have been planted in walls, where they have lived a few years, but have not continued long.

The third sort I received from *Carthagena* in *New Spain*, near which place it grows naturally. This rises with a woody stem, to the height of twelve or fourteen feet, sending out many lateral branches, covered with a russet bark, and garnished with oblong oval leaves; the flowers are produced from the side of the branches singly, which are like those of the last sort.

The fourth sort was also sent me from *Carthagena*. This grows with a strong upright trunk near twenty feet high, sending out many lateral branches, which are covered with a very white bark, and are closely garnished with large oblong stiff leaves, of a thicker consistence than those of the common Laurel, of a splendid green; the flowers come out from the side of the branches, which are large, and the summits of the stamina are purple.

The fifth sort was sent me from the same country. This rises with a trunk about twenty feet high, sending out many long slender branches, covered with a brown bark, and garnished with leaves like those of the Bay tree, but longer, and deeply ribbed on their under side. The flowers are produced upon long foot-stalks, which terminate the branches, each sustaining two or three flowers, which are large, white, and are succeeded by pods two or three inches long, and the thickness of a man's little finger, which are filled with large kidney-shaped seeds.

The sixth sort was sent me from *Tolu* in *America*. This rises with a shrubby stalk to the height of eight or ten feet, sending out many ligneous branches, garnished with oval stiff leaves, which are placed opposite, upon short red foot-stalks; from the wings of the leaves are produced the foot-stalks of the flowers, which are long, slender, and branch out into many smaller, each of which sustains a small white flower, which is succeeded by an oval pod containing many small kidney-shaped seeds.

The seventh sort rises with a shrubby stem, to the height of twelve or fourteen feet, sending out many strong lateral branches, garnished with oblong oval leaves, placed alternately; the leaves are of a thicker consistence than those of the Bay tree; at the foot-stalk of each leaf comes out a single flower, almost the whole length of the branches, which are small, and stand upon short foot-stalks; the summits of these flowers are of a purplish colour, but the stamina are white.

The eighth sort rises with a shrubby stalk, to the height of ten or twelve feet, sending out slender horizontal branches on every side, which are covered with a reddish bark; the joints of these branches are far distant; at each of these come out several leaves in clusters, without order, standing upon pretty long foot-stalks, smooth on their upper side, but have many transverse ribs on their under side, which are prominent.

The ninth sort I received from *Carthageria*, where it grows naturally; this hath many shrubby stalks arising from the root, which send out many lateral branches on every side, closely garnished with large spear-shaped leaves, standing upon very long foot-stalks; the flowers are produced in clusters at the end of the branches, upon very short foot-stalks; they are small, white, with yellowish stamina, and a very long style, which is incurved, terminated by an oblong germen, which afterwards becomes an oblong fruit.

The tenth sort hath slender shrubby stalks, which rise seven or eight feet high, sending out many ligneous branches, garnished with very long nervous spear-shaped leaves. The flowers come out at the end of the branches, three standing upon each foot-stalk; these are small, white, and are succeeded by oval fruit.

These last eight sorts are natives of warm countries, so will not live through the winter in *England*, without the assistance of a stove. They are propagated by seeds, which must be procured from the countries where they grow naturally. These must be sown in small pots, and plunged into a hot-bed of tanners bark. In about two months the plants will appear, provided the seeds are good, then they must have but little wet, and a good share of air in warm weather; when they are large enough to remove, they must be each transplanted into a separate small pot, and plunged into the hot-bed again, observing to shade them until they have taken fresh root, after which they should have fresh air admitted to them every day, in proportion to the warmth of the season. In autumn they must be removed into the stove, and plunged into the bark bed, where they should constantly remain, and will require the same treatment as other tender exotick plants from the same countries, with this difference only, that they require but little water, especially during the winter, for the roots of these plants are very subject to rot with wet.

BEAN CAPER. See *Zygophyllum*.

CAPRARIA. *Lin. Gen. Pl.* 686. Sweet Weed.

The Characters are,

The flower is bell-shaped, of one leaf, divided at the top into five equal parts; it hath four stamina, which are inserted in the base of the petal, and but little more than half so long, two of the under being shorter than the other. It hath a conical germen, which afterwards becomes an oblong conical capsule, com-

pressed at the point, having two cells, divided by a partition filled with roundish seeds.

We have but one Species of this genus, viz.

CAPRARIA *foliis alternis corollis quinquesidis.* Hort. Cliff. 320. Capraria with alternate leaves, and the petal divided into five parts.

This plant grows naturally in the warm parts of *America*, where it is often a troublesome weed in the plantations; it rises with an angular green stalk, about a foot and an half high, sending out branches at every joint, which sometimes come out by pairs opposite, but generally there are three at a joint standing round the stalk; the leaves are also placed round the branches by threes; these stand upon short foot-stalks, are oval, hairy, and a little indented on their edges. The flowers are produced at the wings of the leaves, coming out on each side the stalk, each foot-stalk sustaining three flowers; they are white, and succeeded by conical capsules, compressed at the top, opening in two parts, and filled with small seeds.

This plant is preserved in botanick gardens for the sake of variety; but as it hath no great beauty, it is seldom admitted into other gardens.

It is propagated by seeds, which must be sown upon a hot-bed in the spring of the year, and the plants must be brought forward by planting them upon a second hot-bed; and about the middle or latter end of *June* they may be transplanted into a warm border, and may then be exposed to the open air, where they will perfect their seeds in autumn.

CAPRIFOLIUM. See *Periclymenum*.

CAPSICUM. *Lin. Gen. Plant.* 225. Guinea Pepper.

The Characters are,

The flower hath but one petal, which is wheel-shaped; it hath five small stamina. It hath an oval germen, which afterwards becomes a soft fruit, or capsule, of an indeterminate figure, having two or more cells, divided by intermediate partitions, to which adhere many compressed kidney-shaped seeds.

The Species are,

1. CAPSICUM *caule herbaceo, fructu oblongo propendente.* Capsicum with an herbaceous stalk, and an oblong fruit hanging downward.

2. CAPSICUM *caule herbaceo, fructu cordiformi.* Capsicum with an herbaceous stalk, and a heart-shaped fruit.

3. CAPSICUM *caule herbaceo, fructu maximo anguloso obtuso.* Capsicum with an herbaceous stalk, and a large angular obtuse fruit, commonly called Bell Pepper.

4. CAPSICUM *caule herbaceo, fructu cordiformi anguloso.* Capsicum with an herbaceous stalk, and an angular heart-shaped fruit.

5. CAPSICUM *caule herbaceo, fructu rotundo glabro.* Capsicum with an herbaceous stalk, and a round smooth fruit.

6. CAPSICUM *caule herbaceo, fructu ovato.* Capsicum with an herbaceous stalk, and an oval fruit.

7. CAPSICUM *caule fruticoso foliis lineari-lanceolatis, fructu pyramidali erecto luteo.* Capsicum with a shrubby stalk, narrow spear-shaped leaves, and yellow pyramidal fruit growing upright.

8. CAPSICUM *caule fruticoso fructu conico erecto rubro.* Capsicum with a shrubby stalk, and a conical red fruit growing erect, commonly called Hen Pepper.

9. CAPSICUM *caule fruticoso, fructu parvo pyramidali erecto.* Capsicum with a shrubby stalk, and a small pyramidal fruit growing erect, commonly called Barberry Pepper.

10. CAPSICUM *caule fruticoso, fructu parvo ovato erecto.* Capsicum with a shrubby stalk, and a small oval fruit growing erect, commonly called Bird Pepper.

The first is the common long poded Capsicum, which is frequently cultivated in the gardens. Of this there is one with red, and another with yellow fruit, which only differ

differ in the colour of the fruit, which difference is permanent.

The *Varieties* of yellow *Capficum* are,

Capficum fructu surrecto oblongo. Tourn. *Capficum* with oblong fruit growing erect.

Capficum fructu bifido. Tourn. *Capficum* with a divided fruit.

Capficum siliquis surrectis & oblongis brevibus. Tourn. *Capficum* with oblong and short pods growing erect.

Capficum fructu tereti spithameo. Tourn. *Capficum* with a taper fruit a span long.

Of these different forms I have had both the red and yellow, but neither of them have changed their colours, though they have frequently varied in their shape.

The second sort with heart-shaped fruit is undoubtedly a different species from the first, and never alters toward it, though there are several varieties of this, which sprout from seeds. Of this there are red and yellow fruit, which do not alter in colour, though they produce the following varieties:

Capficum siliqua propendente rotunda & cordiformi. Tourn. *Capficum* with round, heart-shaped, hanging pods.

Capficum siliqua latiore & rotundiore. Tourn. *Capficum* with a larger and rounder pod.

Capficum rotundo maximo. Tourn. *Capficum* with the largest round fruit.

Capficum siliquis surrectis cordiformibus. Tourn. *Capficum* with upright heart-shaped pods.

Capficum siliquis surrectis rotundis. Tourn. *Capficum* with round upright pods.

The third sort I have cultivated many years, and have not found it alter, nor have I seen any other but the red fruit of this. It is the only sort which is proper for pickling; the skin of the fruit being fleshy and tender, whereas those of the other sorts are thin and tough. The pods of this sort are from one inch and an half, to two inches long, are very large, swelling, and wrinkled; flatted at the top, where they are angular, and sometimes stand erect, at others grow downward. When the fruit of this are designed for pickling, they should be gathered before they arrive to their full size, while their rind is tender; then they must be slit down on one side to get out the seeds, after which, they should be soaked two or three days in salt and water; when they are taken out of this and drained, boiling vinegar must be poured on them, in a sufficient quantity to cover them, and closely stopped down for two months; then they should be boiled in the vinegar to make them green; but they want no addition of any sort of spice, and are the wholesomest and best pickle in the world.

The fourth sort is also a distinct species from all the other: this hath broad wrinkled leaves, the fruit is also furrowed and wrinkled, generally growing upright, and of a beautiful scarlet colour: some of the fruit will have their tops compressed like a bonnet, from whence it had the name.

The fifth sort was sent me from the *Spanish West Indies*: this doth not grow so tall as the other sorts, but spreads near the ground. The leaves come out in clusters, which are of a shining green, and stand on long foot-stalks. The fruit is round, smooth, of a beautiful red, and the size of a common Cherry.

The sixth sort I received from *Barbadoes*: this is like the common in its stalk and leaves, but the fruit is oval, and about the size of a *French Olive*.

These six sorts are annual with us, whatever they may be in their native countries, for their stalks decay soon after the fruit is ripe. They are propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants have six leaves, they should be transplanted on another hot-bed, at four or five inches distance, shading them in the day time from the sun, until they have taken root, after which,

they must have a large share of air admitted to them in warm weather, to prevent their drawing up weak. Toward the end of *May*, the plants must be hardened by degrees to bear the open air, and in *June* they should be carefully taken up, preserving as much earth about their roots as possible, and planted into borders of rich earth, observing to water them well, as also to shade them until they have taken root, after which time, they will require no other management, but to keep them clean from weeds, and in very dry seasons, to refresh them two or three times a week with water. These directions are for the culture of the common sorts of *Capficum*, which are generally planted by way of ornament. But the plants of the third sort, which are propagated for pickling, should be planted in a rich spot of ground, in a warm situation, about a foot and an half asunder, and shaded till they have taken root, and afterward duly watered in dry weather; which will greatly promote their growth, and cause them to be more fruitful, as also enlarge the size of the fruit. By this management, there may be three or four crops of fruit for pickling obtained the same year, provided the season proves not too cold.

The fourth, fifth, and sixth sorts being tender, the plants should be put into pots, and placed in an old hot-bed under a deep frame, where they may have room to grow; or if they are planted in the full ground, the plants should be each covered with a bell glass, to screen them from cold. These glasses may be set off every day in warm weather, and placed over them in the evening again; and at such times as the weather is not favourable, the glasses should be raised on the contrary side to the wind, to admit the fresh air. With this care, the fruit of these sorts will ripen in *England*, which without it rarely come to maturity, but in very warm seasons.

The four last sorts have perennial shrubby stalks, which rise four or five feet high; these are not so hardy as the other, therefore when the plants have been brought forward in the hot-bed, as was directed for the common sorts, they should be planted in pots filled with rich earth, and plunged into a very moderate hot-bed, under a deep frame, where they may have room to advance; in warm weather, they should have a large share of air admitted to them, but must be covered with glasses every night, or in cold weather, and frequently watered. With this management, they will produce plenty of fruit in autumn, which ripen in winter; but they must be removed into the stove, on the first approach of frost, and placed where they may have a temperate warmth, in which they will thrive better than in a greater heat; and the fruit will continue in beauty most part of winter, making a pretty appearance in the stove, during that season.

The seeds of the seventh sort I received from *Egypt*: the leaves of this are much narrower than those of any other sort I have yet seen; the pods always grow erect, and are produced in great plenty, so that the plants make a good appearance for three months in the winter.

The eighth sort I received from *Antigua*, by the title of *Hen Pepper*. This rises with a shrubby stalk three or four feet high, sending out many branches toward the top: the fruit is about half an inch long, shaped in form of an obtuse cone, and of a bright red, growing erect.

The ninth sort grows about the same height as the eighth, but differs from it in the shape and size of the fruit: those of this sort being about the bigness of a *Barberry*, and nearly of the same shape. This I have long cultivated, and have not observed it to alter.

The tenth sort is commonly known by the title of *Bird Pepper* in *America*. This rises with a shrubby stalk four or five feet high: the leaves are of a lucid green: the fruit grows at the divisions of the branches, standing erect: these are small, oval, and of a bright red; they are much more sharp and biting than those of the other sorts. From the fruit

of this sort, is made the *Cayan* butter or what the inhabitants of *America* call Pepper pots, which they esteem as the best of all the spices.

CARACALLA. See Phaeolus.

CARAGANA. See Robinia.

CARDAMINDUM. See Tropæolum.

CARDAMINE. *Lin. Sp. Plant.* 727. In *English*, Ladies-smock.

The Characters are,

The flower hath four oblong petals, placed in form of a cross; it hath six stamina, four of which are the length of the empalement; the other two, which are opposite, are much longer. It hath a cylindrical germen, which after-ward turns to a long compressed cylindrical pod, with two cells, opening in two valves, which twist spirally, and cast out the seeds when ripe, by their elasticity.

The Species are,

1. CARDAMINE *foliis pinnatis, foliolis radicalibus subrotundis, caulinis lanceolatis.* *Lin. Sp. Plant.* 656. Meadow Ladies-smock with a large purplish flower.

2. CARDAMINE *foliis pinnatis, foliolis incis, floribus exiguis, caule erecto ramoso.* Annual impatient Cress, with a very small flower.

3. CARDAMINE *foliis pinnatis, floribus tetrandis.* *Hort. Cliff.* 336. Ladies-smock, or impatient Cress with winged leaves, and flowers with four stamina.

4. CARDAMINE *foliis pinnatis foliolis radicalibus subrotundis, caulinis angulatis.* Impatient Cress with winged leaves, whose lower small leaves are roundish, and those on the stalks angular.

5. CARDAMINE *foliis pinnatis foliolis palmatis equalibus petiolatis.* *Prod. Leyd.* 345. Sicilian impatient Cress with Fumitory leaves.

6. CARDAMINE *foliis pinnatis, foliolis subrotundis angulosis.* *Hall. Helv.* 558. Greater bitter Water Cress.

7. CARDAMINE *foliis ternatis obtusis, caule subnudo.* *Lin. Sp. Pl.* 654. Alpine three-leaved Cress.

8. CARDAMINE *foliis simplicibus ovatis integerrimis petiolis longis.* *Flor. Lap.* 206. Smaller Alpine Cress with a Daisy leaf.

9. CARDAMINE *foliis simplicibus oblongis dentatis.* *Lin. Sp. Pl.* 654. Rock Cress.

10. CARDAMINE *foliis pinnatis foliolis quinis incis.* *Lin. Sp. Plant.* 655. Smooth impatient Cress, with a Celandine leaf.

The first sort grows naturally in the meadows, in many parts of *England*; it is called Cuckow-flower, and Ladies-smock. Of this there are four varieties, viz. the single with purple and white flowers, which are frequently intermixed in the meadows, and the double flower of both colours. The single sorts are seldom admitted into gardens; but as the first sort stands in the list of medicinal plants, so I have enumerated it. The young leaves of this plant have been gathered in the spring, by some persons, and put into sallats instead of Cress: it is supposed to be an antiscorbutick.

The two varieties with double flowers, were accidentally found growing in the meadows, and were transplanted into gardens, where they have been propagated. These deserve a place in shady moist borders of the flower garden, where they will thrive, and make a pretty appearance during their continuance in flower. They are propagated by parting their roots; the best time for this is the autumn, at which time they should be transplanted. They delight in a soft loamy soil, not too stiff, and must have a shady situation.

The seventh, eighth, and tenth sorts grow naturally on the *Alps*, and other mountainous places. These are low perennial plants, which may be propagated by parting of their roots in the autumn, and require a strong soil and shady situation: they may also be propagated by seeds, which should

be sown in the autumn, on a shady border, where they will come up soon after, and are never hurt by frost.

The ninth sort is a low biennial plant, which grows naturally in several parts of *England* and *Wales*; and is preserved in some gardens, for the sake of variety.

The sixth sort grows naturally by the sides of rivers, and in ditches, in most parts of *England*, so is not admitted into gardens.

The other sorts are low annual plants, which grow naturally in several parts of *England*. These have the title of Impatient Cress, from the elasticity of their pods, which, if touched when they are ripe, spring open, and cast out their seeds with violence, to a considerable distance. These sorts when young, are by the country people eaten in sallats, and have the flavour of the common Cress, but milder.

CARDIACA. *Tourn. Inst. R. H.* 186. Motherwort.

The Characters are,

The flower is of the lip kind, of one leaf, with a narrow tube spreading at the brim; it hath four stamina fastened to the upper lip, two of which are longer than the other. It hath four germen, which after-ward becomes four naked oblong seeds, inclosed in the empalement.

The Species are,

1. CARDIACA *foliis radicalibus quinquelobatis, caulinis trilobis acutis.* Common Motherwort.

2. CARDIACA *foliis tripartito multifidis linearibus obtusiusculis.* Motherwort with leaves divided into three parts, which terminate with many very narrow blunt segments.

3. CARDIACA *foliis tripartitis laciniatis, calycibus villosis.* Motherwort with leaves divided into three parts, which are cut on their edges, and hairy empalements.

The first sort is the common Motherwort which is used in medicine. It grows naturally on the side of banks, and in lanes, in many parts of *England*, so is seldom cultivated in gardens.

The lower leaves of this sort are large, and divided into five lobes; the stalks are square, and rise from four to five feet high, garnished with two leaves standing opposite at each joint upon long foot-stalks; these are divided into three lobes, which end in long acute points. The flowers come out at every joint in whorls, just above the leaves, surrounding the stalk, included in prickly empalements; when these decay, they are succeeded by four naked seeds inclosed in the empalement. If the seeds are permitted to scatter, they will fill the ground near them with young plants.

The seeds of the second sort were sent me from *Petersburgh*, by the late Dr. *Amman*, who received them from *Siberia*. This plant hath the appearance of the first sort, and the stalks grow about the same height, but the leaves are deeply cut into three parts, which are again divided toward their extremity into many narrow blunt segments.

The seeds of the third sort were sent me from *Isiria*. This hath a weaker stalk than either of the former, but rises near the same height. The lower leaves of this are divided into five acute parts, and those upon the stalks into three, which are deeply jagged. The empalement of the flower is hairy, but the flower is like that of the common Motherwort.

These two sorts are preserved in botanick gardens for the sake of variety, but are rarely cultivated in other places; they rise easily from seeds sown in the spring upon a bed of common earth, and require no other care but to keep them clean from weeds, and thin them where they are too close.

CARDINALS FLOWER. See Rapuntium.

CARDIOSPERMUM. *Lin. Gen. Pl.* 447. Heart Pea.

The Characters are,

The flower hath four obtuse petals, which are alternately larger, and a small four-leaved nectarium encompassing the germen, with eight stamina, three and three standing opposite, the other

two on each side. The germen is three-cornered, which afterward becomes a roundish swollen capsule with three lobes, divided into three cells, opening at the top, each having one or two globular seeds, marked with a heart.

The Species are,

1. *CARDIOSPERMUM foliis ternato-ternatis acuminatis incisif, petiolis longissimis.* Heart Pea with a smaller leaf and fruit, called in America Wild Parsley.

2. *CARDIOSPERMUM foliis quinato-ternatis acuminatis incisif glabris.* Heart Pea with a larger leaf and fruit.

3. *CARDIOSPERMUM villosum foliis quinato-ternatis, incisif obtusif, petiolis brevibus.* Hairy Heart Seed with leaves divided by fives, and those divided again into three parts, which are bluntly cut, and have short foot-stalks.

The first sort rises with a slender channelled climbing stalk, to the height of four or five feet, sending out many side branches, garnished with leaves, upon very long foot-stalks, coming out opposite at the lower part of the stalk; but upward the leaves come out on one side, and the foot-stalk of the flower on the other, opposite. The foot-stalk of the flowers are long, naked, and toward the top, divided into three short ones, each sustaining a single flower. Immediately under these divisions, come out a tendril, or clasper, like those of the Vine, but smaller; these fasten themselves to whatever grows near them, and thereby are supported. The flowers are small, white, and composed of four small concave petals, two of which standing opposite, are larger than the other; when these fall away, the germen becomes a large inflated bladder, having three lobes, in each of which is contained one, two, and sometimes three seeds, which are round, hard, and the size of small Peas, each being marked with a black spot in shape of a heart.

The second sort differs from the first in having taller stalks, the leaves being first divided into five, and again into three parts. The foot-stalks are shorter, and the seeds and bladders in which they are contained are much larger, and the whole plant is smoother, in other respects they agree.

The third sort hath stronger stalks than either of the former; the leaves have very short foot-stalks; they have each five parts, which are again divided into three obtuse lobes, which are bluntly indented on their edges, and the whole plant is covered with a yellowish hairy down.

These plants grow naturally in both Indies, where they climb upon whatever shrubs are near them, and there they rise to the height of eight or ten feet, but in England they seldom are above half so high; they send out many side branches, which spread to a considerable distance every way.

They are annual, and perish soon after they have perfected their seeds, and being natives of hot countries, they will not thrive in England in the open air. They are propagated by seeds, which should be sown upon a hot-bed in the spring, and when the plants are two inches high, they should be transplanted into pots, then plunged into a very moderate hot-bed, where they must be carefully shaded until they have taken fresh root; after which they must have a large share of air admitted to them every day, to prevent their being drawn up weak: then they may be removed into a glass case, where they may have room to grow and be screened from the cold of the nights, but in warm weather they will require a large share of air; with this management they will flower in July, and their seeds will ripen in autumn.

CARDUUS. Lin. Gen. Plant. 832. Thistle.

The Characters are,

It hath a compound flower, made up of many hermaphrodite florets which are fruitful; these are included in one common scaly empalement; the florets are funnel shaped, and of one leaf; each of these florets have five short hairy stamina. In the center is situated an oval germen, crowned with down, which afterward

becomes an oblong four-cornered seed, crowned with down, and inclosed by the prickly empalement.

The Species are,

1. *CARDUUS foliis integris subtus tomentosis, spinis ramosis lateralibus.* Prod. Leyd. 133. Low prickly Thistle with leaves like the Eternal flower.

2. *CARDUUS foliis sessilibus bifariam pinnatifidis laciniis alternis erectis, calycibus globosis villosis.* Hort. Upsal. 249. Woolly-headed Thistle, called by some Friars Cowl.

3. *CARDUUS foliis lanceolatis dentatis ciliatis decurrentibus, spinis marginalibus duplicibus.* Greater Fish Thistle.

4. *CARDUUS squamis calycinis margine apiceque spinosis.* Hort. Cliff. 393. Our Ladies Thistle, or Milk Thistle.

5. *CARDUUS foliis lanceolatis decurrentibus denticulis inermibus, calyce spinoso.* Hort. Cliff. 392. English soft or gentle Thistle.

6. *CARDUUS foliis lanceolatis sessilibus integerrimis margine spinis ternatis.* Hort. Cliff. 393. The supposed true Fish Thistle of Theophrastus.

There are a great number of species more than are here enumerated; some of which are very troublesome weeds in the gardens and fields, therefore are better to be kept out of both; so I thought it needless to mention them here.

The first sort grows naturally in Sicily. This is an annual plant, which rises with a channelled stalk about two feet high, sending out several side branches toward the top, garnished with long narrow leaves, like those of Austrian Parmica, which are of a deep green above, but white on their under side; just below the foot-stalk of the leaf, come out several unequal yellow spines; at the end of the branches the flowers are produced; these have very prickly empalements, under which are placed two long leaves; the flowers are purple, and shaped like those of the common Thistle, but are smaller; these are succeeded by oblong smooth seeds, which have a long woolly down sitting on their top. It is propagated by seeds, which should be sown on a bed of light earth in the spring, where the plants are to remain. The only care they will require, is to keep them clean from weeds, and thin the plants where they are too close.

The second sort grows naturally in several of the midland counties of England. This is a biennial plant, which sends out many long leaves near the ground, placed by pairs, and are joined to a winged border running on each side the midrib the whole length; these segments are alternately pointing upward, armed with long sharp spines, standing every way. The following spring, there arises from the center of the plant one strong channelled stalk, four or five feet high, branching every way toward the top; each branch is terminated by a single head of purple flowers, having a woolly empalement. One or two of these plants may be allowed a place in some abject part of the garden, for its singularity.

The third sort grows naturally in Spain and Portugal. This rises near three feet high, branching toward the top; the leaves are long, narrow, and the edges are set closely with small hairs; at every indenture of the leaves there comes out two long yellowish spines; at the end of the branches the flowers are produced from the side of the stalk, which have woolly oval empalements, closely armed with slender spines. The flowers are yellow, but make no great appearance. This plant may be propagated by seeds, in the same manner as the former sort. It is called Fish Thistle, from the resemblance which the spines have to the bones of fish.

The fourth sort grows very common on the side of banks, and in waste land in many parts of England, and is by some persons blanched and dressed, as a curious dish. This is a biennial plant, which should be sown very thin, and when the plants are come up so as to be well distinguished, the ground should be hoed, to cut down all the young weeds, and the plants left about two feet and an half distance; in

the autumn the leaves of the plants should be tied up, and the earth drawn up close to blanch them; when they are properly whitened, they will be fit for use. This is a biennial plant, which perishes soon after the seeds are ripe.

The fifth sort is a perennial plant, which is by some cultivated for medicinal use, and has been supposed a remedy for some sort of madness. This may be propagated by seeds, in the same manner as the second sort. It grows naturally in the northern parts of *England*, and flowers in *June*.

The sixth sort is supposed to be the true Fish Thistle of *Theophrastus*. This is a biennial plant, which rises with an upright stalk six or seven feet high; is garnished with long spear-shaped leaves, armed with triple spines at every indenture: on the side of the stalks the flowers come out in clusters, which are of a purple colour, and are succeeded by smooth, oval, black seeds. It grows naturally in *Sicily* and the *Levant*. It is propagated by seeds, as the second sort, which should be sown on a warm border, otherwise the plants will not live through the winter.

CARDUUS BENEDICTUS. See Cnicus.

CARDUUS FULLONUM. See Dipsacus.

CARICA. *Lin. Gen. Plant.* 1000. Papaw.

The Characters are,

It is male and female in different plants; the flowers of the male are funnel-shaped, and of one leaf, having a long slender tube, which expands at the top, where it is divided into five narrow obtuse parts; it hath ten stamina, five of which are alternately longer than the other. The female flowers have a small permanent empalement, indented in five parts, with five long spear-shaped petals; the oval germen afterward becomes a large oblong fleshy fruit, having five longitudinal cells, which are full of small oval furrowed seeds, inclosed in a glutinous pulp.

The Species are,

1. CARICA foliorum lobis sinuatis. *Hort. Cliff.* 461. Papaw with the fruit shaped like the Squash.

2. CARICA foliorum lobis integris. *Hort. Cliff.* 461. Papaw with the lobes of the leaves entire.

There are several varieties of the first sort, which differ in the size and shape of their fruit. *Plumier* mentions three of the female or fruitful Papaw, beside the male, one of which he titles Melon-shaped, and the other shaped like the fruit of the Gourd; and I have seen another variety in *England*, with a large smooth pyramidal fruit: but these are supposed to be accidental varieties, which arise from the same seeds.

The first sort rises with a thick, soft, herbaceous stem, to the height of eighteen or twenty feet, which is naked till within two or three feet of the top, and hath marks of the vestiges of the fallen leaves on the stem; the leaves come out on every side upon very long foot-stalks; those which are situated undermost are almost horizontal, but those on the top are erect: these leaves (in full grown plants) are very large, and divided into many parts (or lobes) which are deeply sinuated, or cut into irregular divisions. The whole plant abounds with a milky acrid juice, which is esteemed good for the ringworm: the stem of the plant, and also the foot-stalks of the leaves, are hollow in the middle. The flowers of the male plant are produced from between the leaves, on the upper part of the plant, which have foot-stalks near two feet long, at the ends of which the flowers stand in loose clusters, each having a separate short foot-stalk; these are of a pure white, and have an agreeable odour; sometimes these are succeeded by small fruit, about the size and shape of a Catherine Pear. The flowers of the female Papaw also come out between the leaves, toward the upper part of the plant, upon very short foot-stalks, sitting close to the stem; they are large, and bell-shaped, composed of six petals, and are commonly yellow; when these fall away, the germen swells to a large fleshy fruit, the size of a small Melon, which are of different forms; some are an-

gular, and compressed at both ends, others are oval or globular, and some pyramidal; the fruit also abounds with the same acrid milky juice as the plants. This fruit, when ripe, is by the inhabitants of the *Caribbee Islands* eaten with pepper and sugar as Melons, but are much inferior to a common Melon in flavour, in its native country; but those which have ripened in *England* were detestable; the only use I have known made of this fruit, was, when they were about half grown, to soak them in salt water, to get out the milky juice, and pickle them for Mangos, for which they have been a good substitute.

The second sort was found growing in a garden at *Lima*, by Father *Feuillee*, and was the only plant he saw of that sort in his travels. This differs from the other, in having a branching stalk, the lobes or divisions of the leaves being entire, and the fruit being shaped like a Pear, which he says were of different sizes; that which he designed was about eight inches long, and three and an half thick, yellow within and without, and of a sweet flavour. The flower, he says, was of a Rose colour, and divided into five parts.

These plants being natives of hot countries will not thrive in *England*, unless they are preserved in a warm stove, which should be of a proper height to contain the plants. When they are grown to a large size, they make a noble appearance, with their strong upright stems, which are garnished on every side near the top, with large shining leaves, spreading out near three feet all round the stem: the flowers of the male sort come out in clusters on every side; and the fruit of the female growing round the stalks, between the leaves, being so different from any thing of *European* production, may intitle them to the care of the curious.

They are easily propagated by seeds, which are annually brought in plenty from the *West Indies*. These should be sown in a hot-bed, early in the spring: when the plants are near two inches high, they should be each transplanted into a separate small pot, and plunged into a hot-bed of tanners bark, carefully shading them from the sun till they have taken root; after which they must be treated in the same manner as other tender plants from the same country; but as these plants have soft herbaceous stalks, and abound with a milky juice, so they must not have much water, for they are frequently killed with moisture. When these plants are shifted from small pots into larger, care must be taken to preserve the ball of earth to the roots, for whenever their roots are left bare, they rarely survive it.

CARLINA. *Lin. Gen. Plant.* 836. The Carline Thistle.

The Characters are,

It hath a compound flower, made up of many hermaphrodite florets which are fruitful, included in a common swollen scaly empalement. The florets are funnel shaped, and cut into five parts at the brim; these have each five short hairy stamina. In the center is situated a short germen crowned with down, which afterward becomes a single taper seed, crowned with a branching plumose down.

The Species are,

1. CARLINA caule multifloro corymboso, floribus terminalibus. *Hort. Cliff.* 395. Common wild Carline Thistle.

2. CARLINA floribus sessilibus, lateralibus paucissimis. *Sauv. Meth.* 293. Small wild Spanish Carline Thistle.

3. CARLINA caule unifloro flore brevior. *Hort. Cliff.* 395. Low Carline Thistle with a large white flower.

4. CARLINA caule trifloro dichotomo intermedio sessili. *Sauv. Monsp.* 293. Fish Thistle with a reddish purple spreading flower.

5. CARLINA caule multifloro subdiviso, floribus sessilibus. *Prod. Leyd.* 135. Umbellated Fish Thistle of *Apulia*.

The first sort grows naturally upon sterile ground, in most parts of *England*, so is rarely admitted into gardens, but the others are preserved in botanick gardens for the sake of variety.

riety. They grow naturally in the south of *France, Spain,* and *Italy*.

They may all be propagated by sowing of their seeds in the spring on a bed of fresh undunged earth, where they are designed to remain; for, as they send forth tap roots, they will not bear transplanting so well as most other plants. When the plants appear above ground, they should be carefully weeded; and, as they grow in size, they should be thinned where they are too close, leaving them about ten inches or a foot asunder. The second year most of these plants will flower; but, unless the summer proves dry, they rarely produce good seeds in *England*; and most of them decay soon after they have flowered; therefore it is pretty difficult to maintain these plants in this country.

CARNATION. See *Dianthus*.

CARPINUS. *Lin. Gen. Plant.* 952. The Hornbeam, or Hardbeam.

The Characters are,

It hath male and female flowers, growing separate on the same plant. The male flowers are disposed in a cylindrical rope or katkin; the flowers have ten small stamina. The female flowers are disposed in the same form; these have one petal, which is shaped like a cup, cut into six parts, with two short germen. The katkin afterward grows large, and at the base of each scale is lodged an oval angular nut.

The Species are,

1. CARPINUS *squamis strobilorum planis.* *Hort. Cliff.* 447. Common Hornbeam.

2. CARPINUS *squamis strobilorum inflatis.* *Hort. Cliff.* 447. The Hop Hornbeam.

3. CARPINUS *foliis ovato-lanceolatis serratis strobilis brevibus.* Eastern Hornbeam, with a smaller leaf and shorter fruit.

4. CARPINUS *foliis lanceolatis acuminatis, strobilis longissimis.* *Virginia* flowering Hornbeam.

The first sort is very common in many parts of *England*, but is rarely suffered to grow as a timber tree, being generally reduced to pollards by the country people; yet where the young trees have been properly treated, they have grown to a large size. Of late years, this has been only considered as a shrub, and never cultivated but for under-wood in the country, and in the nurseries to form hedges, after the *Freuch* taste; but since these sort of ornaments have been almost banished from the *English* gardens, there has been little demand for these trees in the nurseries.

As this tree will thrive upon cold, barren, exposed hills, and in such situations where few other sorts will grow, so it may be cultivated to great advantage by the proprietors of such lands. But where these are propagated for timber, they should be raised from seeds, upon the same soil, and in the same situation, where they are designed to grow. Nor should they be propagated by layers, which is the common method where they are intended for hedges or under-wood; for which those so raised will answer the purpose full as well as those raised from seeds, but the latter must always be preferred for timber trees.

The seeds of this tree should be sown in the autumn, soon after they are ripe; for if they are kept out of the ground till spring, the plants will not come up till the following year. When the plants appear, they must be kept very clean from weeds, and treated as other forest trees; in two years time they will be fit to transplant, for the sooner all trees which are designed for timber are planted where they are to remain, the larger they will grow, and the wood will be firmer and more durable. If they are kept clean from weeds three or four years, it will greatly promote their growth, after which the plants will have obtained sufficient strength to keep down the weeds.

As the trees advance in their growth, so they must be thinned, which should be done with caution, cutting away

the most unpromising plants gradually, so as not to let too much cold air at once to those which are left, especially on the borders of the plantation.

The timber of this tree is very tough and flexible, so might be converted to many useful purposes, when suffered to grow to a proper size; but as they have been generally treated otherwise, so the principal uses it has been applied to, was for turnery ware, for which it is an excellent wood, and also for making mill cogs, heads of beetles, &c. It is also excellent fuel.

The Hop Hornbeam sheds its leaves in the winter, with the Elm, and other deciduous trees. It is said to grow plentifully in many parts of *North America*, but it is doubtful whether that is not a different sort from this. The Hop Hornbeam is of quicker growth than the common sort, but what the wood of that will be I do not know; for there are but few of the trees in *England* growing upon their own roots, most of them having been grafted upon the common Hornbeam, which is the usual method of propagating them in the nurseries; but the trees so raised are of short duration, for the graft generally grows much faster than the stock, so that in a few years there is a great disproportion in their size; and where they happen to stand exposed to strong winds, the graft is frequently broken from the stock, after many years growth; for which reason, I would caution every person not to purchase any of these trees which have been so propagated.

The *Virginia* flowering Hornbeam is less common than the last, and only to be seen in curious gardens; it is equally hardy as the other, and may be increased by layers.

The Eastern Hornbeam is a tree of humble growth, rarely rising above ten or twelve feet high in this country, shooting out many horizontal irregular branches, so cannot easily be trained up to a stem. The leaves of this sort are much smaller than those of the common Hornbeam, and the branches grow closer together: it may be kept in less compass than almost any other deciduous tree. It is as hardy as any of the sorts, and may be propagated in the same manner; but at present it is rare in the *English* nurseries.

CARROTS. See *Daucus*.

CARTHAMUS. *Lin. Gen. Plant.* 838. Bastard Saffron, or Safflower.

The Characters are,

It hath a flower composed of several hermaphrodite florets, included in one common scaly empalement. The florets are funnel-shaped, cut into five equal segments at the top; these have five short hairy stamina. In the center is situated a short germen, which afterward becomes a single, oblong, angular seed, inclosed in the empalement.

The Species are,

1. CARTHAMUS *foliis ovatis integris serrato aculeatis.* *Hort. Cliff.* 394. Bastard Saffron of the shops, with a Saffron-coloured flower.

2. CARTHAMUS *caule piloso supernè lanato, foliis inferioribus pinnatifidis, summis amplexicaulibus dentatis.* *Hort. Upsal.* 251. Yellow Distaff Thistle.

3. CARTHAMUS *caule glabro, foliis caulinis aculeatis, profundè dentatis, semiamplexicaulibus, capitulis ovatis.* Cnicus of *Crete* with a leaf and appearance of Distaff Thistle, and a whitish flower.

4. CARTHAMUS *foliis lanceolatis, acuminato-serratis.* *Hort. Cliff.* 135. Blue perennial Cnicus of *Tangier*.

5. CARTHAMUS *foliis caulinis linearibus pinnatis longitudine plantæ.* *Lin. Sp. Plant.* 831. Dwarf Cnicus of mount *Lufus* with a blue flower.

6. CARTHAMUS *caule erecto piloso, foliis lanceolatis hirsutis, capite maximo.* Rougher blue Cnicus.

7. CARTHAMUS *foliis ensiformibus sinuato-dentatis.* *Prod. Leyd.* 136. Stinking shrubby Cnicus of *Spain*.

8. CARTHAMUS

8. *CARTHAMUS foliis lineari-lanceolatis spinis marginalibus duplicibus, floribus solitariis terminalibus.* The least stalky Spanish Carline Thistle.

The first sort grows naturally in *Egypt*, and in some of the warm parts of *Asia*. It is at present cultivated in many parts of *Europe*, and also in the *Levant*, from whence great quantities of Safflower are annually imported to *England*, for dying and painting.

This is an annual plant, which rises with a stiff ligneous stalk, two feet and an half, or three feet high, dividing upward into many branches, garnished with oval pointed leaves, sitting close to the branches, which are entire, and are slightly sawed on their edges, each tooth being terminated by a short spine. The flowers grow single at the extremity of each branch: the heads of flowers are large, inclosed in a scaly empalement; each scale is broad at the base, flat, and formed like a leaf of the plant, terminating in a sharp spine. The lower part of the empalement spreads open, but the scales above closely embrace the florets, which stand out near an inch above the empalement; these are of a fine Saffron colour, and this is the part which is gathered for the uses above mentioned. If the season proves cold and moist when the plants are in flower, there will be no good seeds produced; so that there are few seasons, wherein the seeds of this plant come to perfection in *England*.

When this plant is propagated for use, the seeds should be sown in drills, drawn at two feet and an half distance from each other, in which the seeds should be scattered thinly, for the plants must not be left nearer each other, than a foot in the rows; but as some of the seeds will fail, so a greater quantity should be sown, as it will be easy to thin the plants, at the time when the ground is hoed. If the seeds are good, the plants will appear in less than a month; and in three weeks or a month after, it will be proper to hoe the ground, to destroy the weeds, and at the same time, the plants should be thinned where they are too close; but at this time they should not be separated to their full distance, lest some of them should afterward fail; so that if they are now left six inches asunder, there will be room enough for the plants to grow, till the next time of hoeing, when they must be thinned to the distance they are to remain for good: after this they should have a third hoeing, which, if carefully performed in dry weather, will destroy the weeds and make the ground clean, so that the plants will require no farther care till they come to flower; when, if the Safflower is intended for use, the florets should be cut off from the flowers as they come to perfection; but this must be performed when they are perfectly dry, and then they should be dried in a kiln, with a moderate fire, in the same manner as the true Saffron, which will prepare the commodity for use.

But those plants which are designed for seed, the flowers must not be gathered; for if the florets are cut off, it will render the seeds abortive, though they may swell and grow to their usual size, as I have frequently experienced; yet when they are broken, there will be found nothing more than a shell without any kernel. And this frequently happens to be the case with the seeds, in wet cold seasons; though in very wet years the germen will rot, and never come so forward as to form a shell.

The quantity of Safflower which is annually consumed in *England* is so great, as to make a very considerable article in trade, therefore might be very well worthy of the publick attention. If this plant was introduced to *Carolina*, it might be there cultivated to as great advantage, as in any part of the world, for there the seeds will constantly ripen; and, as this country is furnished with it from the *Mediterranean*, where there is great danger of our navigation being interrupted, so it should excite the inhabitants of our *American* colonies, to make trial of as many of the vegetables,

as there is a probability of succeeding there, as can be procured, which are of real use in any of the manufactures of this country. The seeds of this plant I sent to *Carolina* in the year 1758, which have succeeded there; and more seeds may be easily procured from the *American* islands, and in one season may be multiplied in so great quantity, as to furnish a whole province.

The good quality of this commodity is chiefly in the colour, which should be of a bright Saffron colour, and herein that which is cultivated in *England* often fails; for if there happens much rain, during the time the plants are in flower, it will cause the florets to change to a dark or dirty yellow, which will also befall that which is gathered when there is any moisture remaining upon it; therefore great care must be taken not to gather it till the dew is quite dried off, nor should it be pressed together till it has been dried on the kiln. The manner of doing this being the same as for the true Saffron, I shall not mention it here.

This plant may be admitted to have a place in the borders of large gardens, where it will add to the variety, during the time of its continuance in flower, which is commonly two months, or ten weeks; for if the seed be sown in the beginning of *April*, the first flowers will appear in the middle of *July* at farthest, and there will be a succession of flowers on the side branches till the end of *September*, or in mild warm weather till the middle of *October*.

When they are cultivated for this purpose, the seeds should be sown in the places where the plants are designed to remain, because they do not bear transplanting well; therefore three or four seeds should be sown in each patch, lest any of them should fail, and when the plants are grown so strong as to be out of danger, the most promising in each patch should be left, and the others pulled up, that they may not draw or injure those which are to stand.

The second sort grows naturally in the south of *France*, *Spain*, and *Italy*, where the women use the stalks of this plant for distaffs, from whence it had the title of Distaff Thistle.

The third sort was also discovered by *Tournefort* in the island of *Crete*. This differs from the former in having a smooth stalk, the leaves are very stiff, deeply indented, smooth, and are armed with very strong spines; the heads of flowers are oval, the florets white, and the plant grows near four feet high. This is an annual plant, which may be sown and treated in the same way as the former, and flowers about the same time.

The fourth sort hath a perennial root. This grows naturally in *Spain*, and was first brought to *England* from *Tangier*. It is propagated by parting of the roots. The best time for transplanting and parting them, is about the beginning of *March*; this should have a dry soil and a warm situation, otherwise the plants are liable to be destroyed in severe winters.

The fifth sort grows naturally in the south of *France*, *Spain*, and *Italy*. This hath a perennial root, the stalk rises about six inches high, is channelled, hairy, and garnished with long narrow leaves, ending in several sharp spines. Each stalk is terminated by one large head of blue flowers, having a leafy empalement, composed of very broad scales, each ending in a sharp spine.

This sort is difficult to propagate in *England*, for the roots do not put out offsets like the former, so is only to be raised from seeds, which do not come to perfection here, unless the season proves warm and dry. The plants should have a dry soil and a warm situation.

The sixth sort rises with a single stalk about two feet high, which is of a purplish colour, hairy, and channelled, pretty closely garnished with broad spear-shaped leaves, which are sharply sawed on their edges, and covered with a short hair-

ry down. The stalk is terminated by a single large head of blue flowers, having a scaly empalement. This sort may be propagated by parting of their roots, which should be performed in autumn, when the leaves decay. It should have a light dry soil, in which it will endure the cold of our winters, and continue many years.

The seventh sort I received from *Andalusia*, where it grows naturally in great plenty. This rises with a shrubby perennial stalk, to the height of eight or ten feet, which divides into many branches; these are garnished with pretty long sword-shaped leaves, which are indented, and armed with spines on their edges; they embrace the stalks with their base. The branches are terminated by large, scaly, prickly heads of yellow flowers, which come out in *July*, but are never succeeded by seeds in this country, so can only be propagated by side shoots, slipped from the branches in the spring, and planted in pots, and plunged into a moderate hot-bed, till they have taken root; then they must be gradually hardened, and removed into the open air, and when they have obtained strength, they may be separated, and some of them planted in a warm dry border, where they will endure the cold of our ordinary winters; but, in severe frost, they are frequently destroyed, therefore a plant or two should be kept in pots, and sheltered in the winter to preserve the species.

CARUM. *Lin. Gen. Plant.* 327. Carui, or Caraway.

The Characters are,

It hath an umbellated flower, composed of several small umbels, which are formed as rays to the general umbel, neither of which have any involucre; the flower hath five heart-shaped petals, and five hairy stamina. The germen is situated under the flower, which afterward becomes an oblong channelled fruit, dividing into two parts, each having an oblong furrowed seed.

The Species are,

1. CARUM foliis pinnatifidis planis, umbellulis inaequalibus confertis. Meadow Cumin, or Caraway of the shops.

2. CARUM foliis capillaribus multifidis, umbellis laxis. Caraway with capillary multifid leaves, and loose umbels.

The first sort is the common Caraway, whose seeds are greatly used, not only in medicine, but also in the kitchen, &c. This grows naturally in some rich meadows in *Lincolnshire* and *Yorkshire*, and is sometimes found growing in the pastures near *London*. It is also cultivated for use in *Essex*, and some other counties.

It is a biennial plant, which rises from seeds one year, flowers the next, and perishes soon after the seeds are ripe. It hath a taper root like a Parsnep, but much smaller, which runs deep into the ground, and hath a strong aromatick taste, sending out many small fibres; from the root arises one or two smooth, solid, channelled stalks, about two feet high, garnished with winged leaves, having long naked foot-stalks. The stalks divide upward into several smaller branches, each of which is terminated by an umbel, composed of six or eight small separate umbels, sustaining single white flowers, with heart-shaped petals; the flowers of these small umbels are closely joined together. After the flowers are decayed, the germen becomes an oblong channelled fruit, composed of two oblong channelled seeds.

The best season for sowing the seeds of this plant, is in autumn, soon after they are ripe, when they will more certainly grow, than those sown in the spring; and the plants which rise in the autumn, generally flower the following season, so that a summer's growth is hereby saved.

The second sort grows naturally in *Spain*. This plant rises with a stronger stalk than the former, which seldom grows more than a foot and an half high, but is closely garnished with fine narrow leaves, like those of *Dill*; the stalks divide upward into many branches, each being terminated by loose umbels, of white flowers, which are succeeded by long

furrowed seeds, having the same aromatick flavour as the common sort. This is a biennial plant, and may be treated in the same manner as the former.

CARYOPHYLLATA. See Geum.

CARYOPHYLLUS. *Lin. Gen. Plant.* 594. The Clove Tree, or All-spice.

The Characters are,

It hath a double empalement; the flower is of one leaf, cut into four obtuse parts, upon which the germen is situated; the fruit hath another empalement, which is small, and slightly divided into four parts, which are permanent. The flower hath four blunt petals; it has many stamina. The germen is situated under the flower, which afterward becomes a soft berry with two cells, each containing a single kidney-shaped seed.

The Species are,

1. CARYOPHYLLUS foliis ovato-lanceolatis oppositis, floribus terminalibus, staminibus corollâ longioribus. The Clove tree with oval spear-shaped leaves growing opposite, and flowers terminating the stalks, whose stamina are longer than the petals.

2. CARYOPHYLLUS foliis lanceolatis oppositis, floribus racemosis terminalibus, & axillaribus. The Pimento, or All-spice.

3. CARYOPHYLLUS foliis lanceolatis oppositis, floribus geminatis alaribus. *Brown. Hist. Jam.* 248. Clove tree with spear-shaped leaves placed opposite, and flowers growing by pairs from the sides of the stalks.

4. CARYOPHYLLUS foliis ovatis obtusis oppositis, floribus sparsis alaribus. Clove tree with oval blunt leaves placed opposite, and flowers growing thinly from the sides of the branches.

5. CARYOPHYLLUS foliis oblongo-ovatis, emarginatis, rigidis, glabris, floribus racemosis terminalibus. Clove tree with oblong oval leaves, which are stiff, smooth, and indented at the edges, and flowers growing in bunches terminating the stalk.

The first sort grows naturally in the *Moluccas*, and the hottest parts of the world, where it rises to the height of a common Apple tree; but the trunk generally divides at about four or five feet from the ground, into three or four large limbs, which grow erect, and are covered with a thin smooth bark, which adheres closely to the wood. These limbs divide into many small branches, which form a sort of conical figure; the leaves are like those of the Bay tree, and are placed opposite on the branches. The flowers are produced in loose bunches at the end of the branches, which are small, white, and have a great number of stamina, which are much longer than the petals. The flowers are succeeded by oval berries, which are crowned with the empalement, divided into four parts, which spread flat on the top of the fruit, in which form they are brought to *Europe*, for it is the young fruit beaten from the trees before they are half grown, which are the Cloves used all over *Europe*.

I have not heard of any plants of this kind being in the gardens, either in *England* or *Holland*, but I chose to mention it here, to introduce the other.

The second sort grows naturally in *Jamaica*, but particularly on the north side of that island, where it is found in great plenty, and is a considerable branch of their trade. The unripe fruit dried, being the All-spice so well known in *Europe*. It is now cultivated with care, in many of the plantations, for the trees will thrive upon shallow rocky land, which is unfit for the Sugar cane, so that a great advantage arises to the planters, from those lands which would otherwise be of small account to them.

This tree grows to the height of thirty feet or more, with a strait trunk, covered with a smooth brown bark, and divides upward into many branches which come out opposite; these are garnished with oblong leaves, resembling those of the Bay tree, both in form, colour, and texture,

and are also placed opposite; when these are bruised, or broken, they have a very fine aromattick odour, like that of the fruit. The branches grow very regular, so that the trees make a fine appearance, and as they retain their leaves through the year, so they are worthy of being propagated for ornament and shade about the habitations of the planters. The flowers are produced in large loose bunches from the side of the branches, toward their ends; the flowers are small, and of an herbaceous colour, they are male and female upon distinct trees. The male flowers have very small petals, and a great number of stamina in each, which are of the same colour with the petals, and are terminated by oval bifid summits; the female flowers have no stamina, but an oval germen, situated below the flower, supporting a slender style, with a blunt stigma at the top. The germen afterward becomes a globular pulpy berry, including two kidney-shaped seeds.

When the fruit of these trees are designed for use, they are gathered, or beaten down from the trees, a little before they arrive to their full size, and are separated from leaves, stalks, or any rubbish which may have accidentally mixed with them; then the fruit is exposed every day to the sun, spread on cloths, for ten or twelve days to dry, but removed under cover every evening to screen it from the dews; when the fruit is perfectly dry, it is packed up for exportation. If the fruit is permitted to grow to maturity, the pulp which surrounds the seeds is so full of moisture and glutinous, as to stick to the fingers of those who bruise them, therefore are unfit for those uses, to which the dried fruit are applied.

This tree is propagated by seeds, which in the natural place of its growth is conveyed and sown by birds, to a great distance; and, it is very probable, the seeds passing through them, are rendered fitter for vegetation, than those which are immediately gathered from the tree; for I have received great quantities of the berries, which were perfectly ripe and fresh, great part of which I sowed in different ways, and communicated some of them to several other curious persons, who did the same, but none of them have yet succeeded.

The plants cannot be preserved in *England*, unless they are placed in a stove during the winter season, but they will thrive in a moderate degree of warmth; they should be planted in a soft loamy soil, and, in winter, must have but little water; in the summer they should have a large share of air, and in *July*, if the season proves warm, they may be placed in the open air, in a warm sheltered situation, but upon the approach of cold nights, they must be removed into the stove again. The exposing of these plants to the open air, for one month only, will be of great service to clean their leaves from insects or filth, which they are subject to contract, by remaining long in the stove; but if the season should prove very wet or cold, it will not be safe to trust these plants long abroad; therefore their leaves should be now and then washed with a sponge to clean them, which will not only render them more sightly, but also promote their growth. This plant, being an ever-green, makes a fine appearance in the stove at all seasons of the year; and their leaves having such an agreeable fragrantcy when rubbed, render them as worthy of a place in the stove, as any other exotick plant which is preserved for ornament.

The third sort grows naturally in *Jamaica*. This rises with a divided trunk to the height of eighteen or twenty feet, sending out many branches, which are placed opposite, and are covered with a gray bark: the leaves come out by pairs, which are shorter and rounder at their points, than those of the last species; they are also smoother, and of a firmer texture. The flowers come out from the side of the branches, between the leaves, upon

slender foot-stalks, about an inch in length, two generally arising from the same point: these are succeeded by round berries, of a brighter colour than those of the former, having the empalement on their crowns. The leaves and fruit of this sort have no aromattick flavour, so are not of use, but the characters of the flower and fruit are the same as in the other sort.

The fourth sort was sent me from *Carthage* in *New Spain*. This rises with many irregular stems, about twelve or fourteen feet high, which are covered with an Ash-coloured bark, and divide into many branches upward: these are garnished with stiff oval leaves, placed opposite. The flowers are produced from the side of the branches, sometimes four, five, or six foot-stalks arise from the same point; at other times they come out single, or perhaps by pairs: these are white, and of the same shape with those of the second sort, and are succeeded by berries which are rounder, and, for the most part, contain but one kidney-shaped seed.

This sort agrees with the second in its general characters, but not in the virtues, for it hath none of the aromattick flavour with which that abounds; but as it retains its leaves through the year, may merit a place in the stove, better than many other plants which are preserved by the curious. This is propagated by seeds, in the same way as the second sort, and the plants must be treated in the same manner as those.

The fifth sort was sent me from the island of *Barbuda*, where it rises to the height of twenty feet: the trunk and branches are covered with a smooth brown bark. The branches come out opposite; these grow erect, and are garnished with very smooth lucid leaves, which are placed by pairs, and have very short foot-stalks. The leaves vary much in their form, some of them are oval, others are oblong, and some are indented so deeply at their ends, as to be almost heart-shaped. Their consistence is much thicker than those of the common *Laurel*, and their colour is a splendid green, with one deep midrib running through their middle, and many small veins going from thence transversely to their border. The flowers are produced in small loose bunches at the extremity of the branches, which have several narrow leaves intermixed with the bunches. The flowers are succeeded by berries of the same shape with those of the second sort, but are larger.

This tree is propagated by seeds as the other species, and deserves a place in the stove for the beauty of its ever-green leaves, which being of a thick consistence, and of a shining green colour, make a fine appearance at all seasons of the year; but this hath no aromattick flavour to recommend it, as hath the second sort, for which reason it is seldom noticed. I take this to be the Bay tree, mentioned by *Hughes* in the history of *Barbadoes*, which he describes to have no flavour; for I have seen plants of this sort which were brought from *Barbadoes*, so that I suppose it grows naturally there.

CASIA. See *Osyris*.

CASSIA. *Lin. Gen. Pl.* 461. Wild Senna.

The Characters are,

The flower hath five roundish concave petals, which spread open; it hath ten declining stamina, three of the lower are long, the three upper are shorter; the summits of the three lower are large, arched, beaked, and separated at their points. In the center is situated a long taper germen, which afterward becomes a long pod, divided by transverse partitions, each containing one or two roundish seeds, fastened to the margin of the upper valve.

The Species are,

1. *CASSIA foliolis quinquejugatis, ovato-lanceolatis, margine scabris, exterioribus majoribus, glandulâ baseos petiolorum.* *Lin. Sp. Plant.* 377. Cassia with leaves composed of five pair of

oval

oval spear-shaped lobes with rough borders, the upper lobes being the largest, and a small gland at the base of the foot-stalk.

2. *CASSIA foliolis quinquejugatis ovatis glabris, exterioribus longioribus, caule fruticoso.* Cassia with leaves composed of five pair of smooth, oval lobes, the upper being the longest, and a shrubby stalk.

3. *CASSIA foliolis octojugatis, ovali-oblongis, interioribus minoribus, petiolis eglandulosis stipulis patulis, Hort. Cliff. 158.* Cassia with eight pair of oblong, oval, little leaves, the inner being the least, foot-stalks without glands, and a spreading stipula.

4. *CASSIA foliolis trijugatis, oblongo ovatis æqualibus villosis, siliquis articulatis, caule erecto arboreo.* Cassia with three pair of oblong, oval, hairy leaves, which are equal, jointed pods, and an upright woody stem.

5. *CASSIA foliolis trijugatis, ovato-acuminatis, villosis, floribus solitariis axillaribus, siliquis erectis.* Cassia with three pair of lobes in each leaf, which are oval, pointed, and hairy, and single flowers proceeding from the sides of the stalks, with upright pods.

6. *CASSIA foliolis novemjugatis oblongis, glabris, æqualibus, floribus axillaribus.* Cassia with small leaves, composed of nine pair of lobes, which are oblong, smooth, and equal, and flowers proceeding from the sides of the stalks.

7. *CASSIA foliolis trijugatis obovatis glabris, interioribus rotundioribus minoribus, glandulâ interjectâ globosâ. Hort. Cliff. 159.* Cassia with three pair of oval smooth leaves, the inner one being rounder and smaller, and a globular gland placed between the leaves.

8. *CASSIA foliolis quinquejugatis, ovato-lanceolatis glabris, petiolis eglandulosis. Flor. Zeyl. 149.* Cassia with five pair of leaves, which are oval, spear-shaped, and smooth, and foot-stalks having no glands, or, the purging Cassia of *Alexandria*.

9. *CASSIA foliolis sexjugatis, lanceolatis, glabris, interioribus minoribus, floribus terminatricibus.* Cassia with six pair of leaves, which are smooth and spear-shaped, the inner ones being smaller, and flowers terminating the stalk.

10. *CASSIA foliolis bijugatis, ovato-lanceolatis, glabris, floribus terminalibus, siliquis longis teretibus, caule fruticoso.* Cassia with two pair of leaves which are oval, spear-shaped, and smooth, flowers terminating the stalks, long taper pods, and a shrubby stalk.

11. *CASSIA foliolis duodecimjugatis, oblongis, obtusis, glabris, glandula nulla. Lin. Sp. Plant. 379.* Cassia with twelve pair of leaves, which are oblong, blunt, and smooth, and have no glands; commonly called Horse Cassia.

12. *CASSIA foliolis septemjugatis, oblongo-ovatis, obtusis, floribus spicatis axillaribus, siliquis recurvis.* Cassia with seven pair of leaves, which are oblong, oval and blunt, spikes of flowers proceeding from the sides of the stalks, and recurved pods.

13. *CASSIA foliolis trijugatis, obtusis, emarginatis, caulibus pilosis, floribus solitariis axillaribus petiolis longioribus.* Cassia with three pair of obtuse leaves, indented at the top, hairy stalks, flowers growing singly from the sides of the stalks, and a long foot-stalk.

14. *CASSIA foliolis quadrijugatis oblongo-ovatis, caulibus procumbentibus, floribus axillaribus pedunculis bifloris.* Cassia with four pair of oval, oblong leaves, trailing stalks, and flowers proceeding from the sides of the stalks, two growing upon each foot-stalk.

15. *CASSIA foliolis bijugatis oblongo ovatis, subtus villosis, floribus corymbosis, caule erecto arboreo.* Cassia with two pair of oblong, oval leaves, hairy on their under side, flowers growing in round bunches, and an erect tree like stem.

16. *CASSIA foliolis multijugatis, glandulâ petioli pedicellatâ, stipulis ensiformibus. Hort. Upsal. 101.* Cassia with many pair

of leaves, and the gland on the foot-stalk resembling an insect, and sword-shaped stipulæ.

The first sort grows naturally in most of the islands of the *West Indies*, where it is called Stinking Weed, from its unfavourable odour. This rises with a channelled stalk three or four feet high, dividing into several branches, garnished with winged leaves placed alternately; each of these is composed of five pair of lobes, which are oval, spear-shaped, sitting close to the midrib, and have rough edges. The flowers come out from the side of the stalks, two growing upon each foot-stalk, but the branches are terminated by loose spikes of flowers, which are composed of five concave yellow petals, with ten declining stamina. It hath a flat pod, having a border on each side, and is indented between each seed.

This is a biennial plant, which propagates by seed in plenty, in the countries where it grows naturally; but in *England*, the seeds must be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a separate pot, filled with light earth, and plunged into a moderate hot-bed, to bring them forward; and toward the end of *June*; some of them may be planted into a warm border, where, if the autumn proves favourable, they will flower very well; but these will not perfect their seeds, therefore a plant or two should be put into pots that they may be removed into the stove in autumn to ripen seeds.

The second sort grows in *Jamaica*. This rises with a shrubby stalk five or six feet high, sending out many branches toward the top, with winged leaves, composed of five pair of small oval leaves, the upper ones being longest. The flowers come out from the side of the stalks, and also terminate the branches in loose spikes; they are yellow, and shaped like those of the former, but are smaller; the pods are long, taper, and contain two rows of seed.

This plant may be preserved three or four years in the stove, and will annually flower and perfect the seeds. It is propagated by seeds, which should be sown on a hot-bed in the spring; and the plants must be treated in the same manner as the former sort, with only this difference, that these when they are too tall to remain longer under the frames on the hot-bed, must be removed into the stove.

The third sort hath an herbaceous stalk, which rises five or six feet high, with long winged leaves, composed of eight or ten pair of large oval lobes, rounded at the end, where they are slightly indented. The flowers are produced in loose spikes at the top of the stalk, which are large, yellow, and of the same shape with those of the other species; the pods are long, taper, and have four borders or wings running longitudinally.

This sort seldom continues more than two years; it must be raised from seeds as the former sorts, and placed in the tan bed in the stove, being very tender, and should have but little water in winter.

The fourth sort grows naturally at *Campeachy*. This rises with a woody stem, to the height of fourteen or sixteen feet, sending out many lateral branches, garnished with winged leaves, composed of three pair of oblong, oval, hairy lobes, which are of equal size; the flowers come out in loose bunches at the end of the branches, which are of a pale straw colour and small, but shaped like the others.

This may be propagated by seeds, which must be sown upon a hot-bed, and the plants afterward treated as the former sorts.

The fifth sort is a low herbaceous plant, seldom rising a foot high; the stalk is single, and garnished with winged leaves, composed of three pair of oval, pointed lobes, which are hairy; the flowers come out single from the side of the stalks, they are of a pale yellow, and small; these are succeeded by narrow taper pods two inches long, which grow upright. This plant is annual; the seeds must be sown

sown on a hot-bed, and the plants treated as the first fort.

The sixth fort grows naturally in *Maryland*. It hath a perennial root, composed of a great number of black fibres, and sends out several upright stalks in the spring, which rise six feet high, garnished with winged leaves, composed of nine pair of oblong smooth lobes, which are equal; toward the upper part of the stalks the flowers come out from the wings of the leaves, two or three together. The stalks decay in autumn, and rise again in the spring. The roots of this fort continue many years, and will live abroad in a warm border and a dry soil.

The seventh fort is an annual plant, which rises a foot and half high, with an erect herbaceous stalk, which is garnished with winged leaves, composed of three pair of oval lobes; the flowers come out singly from the wings of the leaves, which are small, yellow, and of the same shape with those of the other species.

This is propagated by seeds, which must be sown on a hot-bed in the spring, and the plants afterward treated in the same manner as hath been directed for the first fort.

The eighth fort is the tree which produces the purging Cassia, which is used in medicine. It grows naturally in *Alexandria*, and in both *Indies*, where it rises to the height of forty or fifty feet, with a larger trunk, dividing into many branches, garnished with winged leaves, composed of five pair of spear-shaped lobes, which are smooth; the flowers are produced in long spikes at the end of the branches, each standing upon a pretty long foot-stalk; they are composed of five large concave petals, of a deep yellow colour, and are succeeded by round pods, which are from one to two feet long, with a dark brown woody shell, having a longitudinal seam on one side, and divided into many cells by transverse partitions, each containing one or two oval, smooth, compressed seeds, lodged in a sweetish black pulp, which is the part used in medicine.

This tree is propagated by seeds, which may be easily procured from the druggists who import the pods for use; which must be sown on a hot-bed in the spring, and when the plants come up, they must be treated in the same manner as the other forts, during the first summer, and in autumn they must be removed into a stove; during the winter they should have very little water, for as these trees grow naturally in dry sandy land, so moisture is a great enemy to them, but especially during that season. The plants may be exposed to the open air, in a sheltered situation, in the summer, in the warmest time of the year.

The ninth fort grows naturally in the *Bahama Islands*. This is an annual plant, which rises with an upright stalk, three feet and a half high, garnished with winged leaves, composed of six pair of lobes, which are smooth, narrow, and spear-shaped, standing at wide distances: the flowers are collected into loose bunches at the top of the stalks, which are of a pale yellow, and are succeeded by long compressed pods. This must be treated as the first fort.

The tenth fort grows at *La Vera Cruz* in *New Spain*. This rises upward of twenty feet high, with several trunks covered with brown bark, which divide into many branches upward, garnished with winged leaves, composed of two pair of lobes, which in the lower leaves are oval, and those of the upper are five inches long, and two and a half broad in the middle, smooth, and of a light green. The flowers are produced in loose spikes at the extremity of the branches, which are large, and of a gold colour.

This fort is propagated by seeds, which must be sown upon a hot-bed, and the plants afterward treated in the same manner as the eighth fort.

The eleventh fort grows in great plenty in most of the islands of the *West-Indies*. This rises to a great magnitude,

with a large trunk, dividing into many branches, garnished with very long winged leaves, composed of twelve or fourteen pair of oblong blunt lobes, which are smooth, of a light green, and placed near together. The flowers come out in loose spikes at the end of the branches, which are of a pale Carnation colour, shaped like those of the other species. This is called Horse Cassia, because it is generally given to horses, and seldom taken by any persons on account of its griping quality.

It is propagated by seeds, which should be sown, and the plants afterward treated in the same manner as the eighth fort.

The twelfth fort grows in the *Havannah*. This hath an herbaceous stalk, which divides into many branches, rising about three feet high, garnished with winged leaves, composed of seven pair of oblong oval lobes, which are rounded at the end. The flowers come out from the side of the branches, upon very long foot-stalks, and are disposed in loose spikes; these are of a pale yellow.

This is a biennial plant, which, if brought forward early in the spring, will sometimes perfect seeds the same year; but if they should fail, the plants may be kept through the winter in a stove, and good seeds may be obtained the following season.

The thirteenth fort rises with several weak shrubby stalks, about two feet high, closely garnished with winged leaves, composed of three pair of lobes, very narrow at their base, enlarging to the top, where they are rounded with a little indenture at the point. The flowers come out single from the side of the branches, standing upon very long foot-stalks; they are of a bright yellow, shaped like those of the other species, and are succeeded by narrow flat pods an inch and a half long. It is propagated by seeds, which must be sown on a hot-bed, and managed as the other tender forts; it will continue two or three years, if placed in a warm stove.

The fourteenth fort sends out from the root two or three slender stalks, which trail on the ground, garnished with winged leaves, having four pair of small roundish lobes, of a pale green; at the insertion of the foot-stalks arise those of the flower, which is jointed, dividing into two shorter at the top, sustaining two small yellow flowers. This is an annual plant, whose seeds must be sown early in the spring on a hot-bed, and treated like the other kinds.

The fifteenth fort grows at *La Vera Cruz* in *New Spain*. This rises with a strong upright trunk, to the height of twenty-five or thirty feet, dividing into many branches, covered with an Ash-coloured bark, garnished with winged leaves having long foot-stalks, each being composed of two pair of oblong oval lobes, which are smooth. The flowers are produced sometimes from the side of the stalks, where they are few and scattering, but the ends of the branches have large round bunches of flowers, which branch out from one center; they are of a deep yellow, inclining to an Orange colour.

The sixteenth fort grows common in all the islands of the *West Indies*. It rises with a slender stalk about two feet high, sending out a few side branches upward, garnished with winged leaves, composed of many pairs of narrow pinnæ, like those of the Sensitive Plant. The flowers come out upon short foot-stalks from the side of the branches, each foot-stalk sustaining two or three yellow flowers, of the same form with the other species of this genus; these are succeeded by short flat pods, containing three or four flat seeds in each.

This is an annual plant, and requires the same treatment as the first; but unless the plants are placed in a glass case, where they may have room to grow, and be screened from the cold, they will not perfect their seeds in *England*.

CASSIDA, Scull Cap. See Scutellaria.

CASSINE. *Lin. Gen. Plant.* 333. The Cassioberry bush, or *South Sea Thea*.

The Characters are,

The flower hath but one petal, which is cut into five obtuse segments; it hath five stamina, which spread from each other, and a conical germen, which after-ward becomes an umbilicated berry with three cells, each containing a single seed.

The Species are,

1. CASSINE *foliis ovato-lanceolatis, serratis, oppositis, floribus, corymbosis axillaribus.* *Fig. Pl. Plat.* 83. *fig.* 1. Cassine with oval spear-shaped leaves placed opposite, and flowers growing in round bunches from the sides of the branches; or, the Cassioberry bush.

2. CASSINE *foliis lanceolatis alternis semper-virentibus, floribus axillaribus.* *Fig. Pl. Plat.* 83. *fig.* 2. Cassine with ever-green spear-shaped leaves placed alternately, and flowers proceeding from the sides of the branches. *Yapon*, or *South-Sea Thea*.

The first sort rises with two or three stems, which send out many side branches, and become bushy; these seldom rise more than eight or nine feet high in *England*. The branches are garnished with oval spear-shaped leaves, sawed on their edges, which grow opposite. At the end of the branches, the flowers come out in roundish bunches; these are white, and divided into five parts almost to the bottom; in their center is placed the germen, attended by five stamina, which spread open, near as much as the segments of the petal. After the flower is past, the germen swells to a round berry, having three cells, each containing a single seed.

This sort is now become pretty common in the nurseries near *London*, where it is propagated by laying down the branches, which afford shoots in plenty for that purpose from the root, and lower part of the stem, so is easily increased. There are numbers of these shrubs which produce flowers in *England* every year, but none of them ripen their seeds.

The leaves of this plant are extremely bitter, so that if a single one is chewed, the bitterness cannot be gotten rid of in a long time.

It loves a light soil, not too dry, and should have a warm situation; for, in exposed places, the young shoots are frequently killed in the winter, whereby the shrubs are rendered unsightly, but where they are near the shelter of trees, or walls, they are very rarely hurt.

The second sort grows naturally in *Carolina*, and also in some parts of *Virginia*, but chiefly near the sea; this, in the natural places of its growth, rises to the height of ten or twelve feet, sending out branches from the ground upward, garnished with spear-shaped leaves, placed alternately, which continue green through the year. The flowers are produced in close whorls round the branches, at the foot-stalks of the leaves; they are white, and of the same shape with the former.

This plant was many years preserved in several curious gardens near *London*, till the severe winter in 1739; when most of them were destroyed, so that there was scarce any left; but of late years there have been many of the young plants raised from seeds, which came from *Carolina*. If this plant can be brought to thrive well in *England*, and to endure the winter in the open air, it will be a fine plant to make a variety in plantations of ever-green trees. The leaves of this sort are not so bitter as those of the first, especially when green.

The inhabitants of *North Carolina* and *Virginia*, where this shrub grows in plenty, give it the title of *Yapon*, which I suppose to be the *Indian* name. The leaves are about the size and shape of those of the small-leaved *Alaternus*, but are somewhat shorter, and a little broader at their base; they are a little notched about their edges, and are of a

thick substance and deep green colour; the flowers of this sort are produced at the joints near the foot-stalk of the leaves, but the Cassioberry bush produces its flowers in umbels at the extremity of the shoots.

These trees are propagated by sowing their seeds (which are obtained from *Carolina*, where they grow in great plenty near the sea coasts); they should be sown in pots, for the seeds do frequently remain in the ground until the second year; therefore the pots should be placed in a shady situation, where they may remain till *October*, when they must be removed into shelter during the winter season; and in *March* following put them upon a fresh hot-bed, which will forward the seeds in their vegetation.

When the plants are come up, they should, by degrees, be exposed to the open air, in order to inure them to our climate, placing them where they may be sheltered from cold winds; they should be sheltered during the two or three first winters under a frame, after which they may be planted abroad in a warm situation, where they will endure the cold of our common winters; but very severe frosts will kill them, if they have not some protection.

In *South Carolina* the plant is called *Cassena* or *South Sea Thea*: the inhabitants of that country do not make so great use of this Tea, as those of *Virginia* and *North Carolina*; in the last of which, the white people have it in as great esteem as the *Indians*, and make as constant use of it.

CASTANEA. *Tourn. Inst. R. H.* 584. The Chestnut tree.

The Characters are,

It hath male and female flowers on the same tree, sometimes at separate distances, and at other times near each other. The male flowers form a sort of katkin; they have no petals, but include about ten or twelve bristly stamina. The female flowers are of one leaf, divided into four parts, having no petals, but a germen fixed to the empalement, which becomes a roundish fruit armed with soft spines, including one or more nuts.

The Species are,

1. CASTANEA *foliis lanceolatis acuminato-serratis, subtus nudis.* The manured Chestnut.

2. CASTANEA *foliis lanceolato-ovatis acutè serratis, subtus tomentosis, amentis filiformibus nodosis.* Chestnut with oval spear-shaped leaves sharply sawed, which are woolly on their under side, and a slender knotted katkin.

3. CASTANEA *foliis oblongo-ovatis, serratis, fructu rotundo maximo echinato.* Chestnut with oblong, oval sawed leaves, and a very large, round, prickly fruit. This is the *Sloanea* of *Plumier*.

The Chestnut is a tree which deserves our care, as much as any of the trees which are propagated in this country, either for its use or beauty, being one of the best sort of timber, and affording a goodly shade. It will grow to a very great size, and spread its branches finely on every side where it has room. The leaves are large, of a lucid green, and continue late in the autumn; nor are they so liable to be eaten by insects, as are those of the *Oak*, which of late years having frequently happened to the latter, which has rendered them very unsightly great part of summer. There is no better food for deer, and many other animals, than their nuts, which most of them prefer to *Acorns*; but yet, there should not be many of these trees planted too near the habitation; because, when they are in flower, they emit a very disagreeable odour, which is very offensive to most people.

There are some varieties of this tree, which have accidentally arisen from seeds, that have been supposed distinct species; but the differences are only in the size of their fruit and leaves, which have been altered and improved by culture; so that the wild and manured Chestnut, are undoubtedly the same; for I have frequently found, that the nuts taken from the same tree, and cultivated in the

the same soil, with equal care, have produced trees with very small fruit; and among them have been others, whose fruit have been as large as those of the parent tree; therefore they can be only esteemed as varieties. But in many countries, where the trees are cultivated for their fruit, the people graft the largest and fairest fruit, upon stocks of Chestnut raised from the nut; and these grafted trees are by the *French* called *Maronnier*, but these grafted trees are unfit for timber.

There is also a Chestnut with variegated leaves, which is propagated in the nurseries by way of curiosity: this is maintained by budding, and inarching it upon common Chestnut stocks, in the same manner as other fruit trees; but these variegated trees and plants are not so much regarded at present, as they were some years past.

The third sort grows in *South Carolina*, from whence some of the fruit with their outer covers, were sent to his grace the duke of *Bedford*, a few years past: these were as large and round as a tennis-ball, and armed all over with strong spines like a hedge-hog: these capsulæ were divided regularly in four cells, each containing one small Chestnut. At that time I compared these with father *Plumier's* description and figure, which he exhibited under the title of *Sloanea*, and found them to agree exactly; and upon looking in the box in which they were sent, I found some of the leaves of the tree, which also tallied with his description, and confirmed my former opinion.

The first of these trees was formerly in greater plenty amongst us than at present, as may be proved by the old buildings in *London*, which were for the most part of this timber; and in a description of *London*, written by *Fitz-Stephens*, in *Henry the second's* time, he speaks of a very noble forest, which grew on the north part of it: *Proximè* (says he) *patet foresta ingens, saltus numerosi ferarum, latebræ cervorum, damarum, aprorum, & taurorum sylvestrium, &c.* And there are some remains of old decayed Chestnuts in *Enfield* chace, not far distant from *London*; which plainly proves, that this tree is not so great a stranger to our climate, as many people believe, and may be cultivated in *England*, to afford an equal profit with any of the larger timber trees, since the wood of this tree is equal in value to the best *Oak*, and, for many purposes, far exceeding it; as particularly for making vessels for all kinds of liquor, it having a property (when once thoroughly seasoned) of maintaining its bulk constantly; and is not subject to shrink or swell, as other timber is too apt to do; and I am certainly informed, that all the large casks, tuns, &c. for their wines in *Italy*, are made of this timber; and it is for that, and many more purposes, in greater esteem among the *Italians*, than any other timber whatever. It is also very valuable for pipes to convey water under ground, as enduring longer than the *Elm*, or any other wood. In *Italy* it is planted for coppice wood, and is very much cultivated in stools, to make stakes for their vines, which will endure seven years, which is longer than any other stakes will do, by near half the time. The usefulness of the timber, together with the beauty of the tree, renders it as well worth propagating as any tree whatever, especially in large plantations in parks.

The trees are propagated by planting the nuts in *February*, in beds of fresh undunged earth. The best nuts for sowing, are such as are brought from *Portugal* and *Spain*, which are commonly sold in winter for eating, provided they are not kiln-dried, which is generally the case of many of those brought from abroad, which is done to prevent their sprouting in their passage; therefore, if they cannot be procured fresh from the tree, it will be much better to use those of the growth of *England*, which are full as good to sow for timber or beauty, as any of the foreign nuts, though their fruit is much smaller: the nuts should be preserved, until the sea-

son for sowing, in sand, where mice, or other vermin cannot come to them, otherwise they will soon destroy them: before you set them, it will be proper to put them into water, to try their goodness, which is known by their ponderosity; such of them as swim upon the surface of the water should be rejected, as good for nothing; but such as sink to the bottom, you may be sure are good.

In setting these seeds or nuts, the best way is, to make a drill with a hoe (as is commonly practised in setting *Kidney Beans*) about four inches deep, in which you should place the nuts, at about four inches distance, with their eye uppermost; then draw the earth over them with a rake, and make a second drill at about a foot distance from the former, proceeding as before, allowing three or four rows in a bed, with an alley between, three feet broad, for a conveniency of clearing the beds, &c. When you have finished your plantation, you must be careful that it is not destroyed by mice, or other vermin; which is very often the case, if they are not prevented by traps, or other means.

In *April* these nuts will appear above ground; you must therefore observe to keep them clear from weeds, especially while young: in these beds they may remain for two years, when you should remove them into a nursery, at a wider distance. The best season for transplanting these trees, is either in *October* or the latter end of *February*; but *October* is the best season: the distance these should have in the nursery, is three feet row from row, and one foot in the rows. If these trees have a downright tap root, it should be cut off, especially if they are intended to be removed again; this will occasion their putting out lateral roots, and render them less subject to miscarry, when they are removed for good.

The time generally allowed them in the nursery, is three or four years, according to their growth; but the younger they are transplanted, the better they will succeed; young trees of this sort are very apt to have crooked stems; but when they are transplanted out, and have room to grow, as they increase in bulk, they will grow more upright, and their stems will become strait, as I have frequently observed, where there have been great plantations.

After they have remained three or four years in the nursery, they will be fit for transplanting where they are to remain; for the younger they are planted out for good, the better they will succeed. But if they are propagated for timber, it is by much the better method to sow them in furrows (as is practised for *Oaks*, &c.) and let them remain unremoved; for these trees are apt to have a downright tap root, which, being hurt by transplanting, is often a check to their upright growth, and causes them to shoot out into lateral branches, as is the case with the *Oak*, *Walnut*, &c.

If you design a large plantation of these trees for timber, after having two or three times ploughed the ground, the better to destroy the roots of weeds, you should make your furrows about six feet distance from each other, in which you should lay the nuts about ten inches apart, covering them with earth about two inches deep; and when they come up, you must carefully clear them from weeds: the distance allowed between each row, is for the use of the horse hoeing plough, which will dispatch a great deal of this work in a short time; but it should be performed with great care, so as not to injure the young plants; therefore the middle of the spaces only should be cleaned with this instrument, and a hand hoe must be used to clean between the plants in the rows, and also on each side, where it will be unsafe for the plough to be drawn; and in hand hoeing, there must be great care taken, not to cut the tender rind of the plant. But for the two first years after sowing, it will be advise-

able to dig the ground each winter, because the plants will be too small to admit the hoeing plough, and in summer to hand hoe the ground. When these have remained three or four years (if the nuts succeed well), you will have many of these trees to remove; which should be done at the seasons before directed, leaving the trees about three feet distance in the rows; at which distance they may remain for three or four years more, when you should remove every other tree, to make room for the remaining, which will reduce the whole plantation to six feet square; which will be distance enough for them to remain in, until they are large enough to cut for poles, when you may cut down every other of these trees (making choice of the least promising) within a foot of the ground, in order to make stools for poles, which, in eight or ten years time, will be strong enough to lop for hoops, hop poles, &c. for which purposes they are preferable to most other trees; so that every tenth year, here will be a fresh crop, which will pay the rent of the ground, and all other incumbent charges, and, at the same time, a full crop of growing timber left upon the ground.

The Chinquapin, or Dwarf *Virginian* Chestnut, is at present very rare in *England*; it is very common in the woods of *America*, where it seldom grows above twelve or fourteen feet high, and produces great plenty of nuts, which are, for the most part single, in each outer coat or capsule. This tree is very hardy, and will resist the severest of our winters in the open ground; but is very apt to decay in summer, especially if it is planted in very dry ground. The nuts of these trees, if brought from *America*, should be put up in sand as soon as they are ripe, and sent to *England* immediately; otherwise they lose their growing quality, which is the reason this tree is at present so scarce with us; for not one seed in five hundred sent over ever grew. Indeed, most of the nuts which have been brought over, have been kiln-dried, to preserve them from sprouting, which infallibly destroys the germen: when the nuts arrive, they should be put into the ground as soon as possible; for if they are long kept above ground, they lose their vegetative quality. This sort of Chestnut delights in a moist soil, but if the wet continues long upon the ground in the winter, it is apt to kill the trees.

CASTANEA EQUINA. See Esculus.

CASTOREA. See Durantia.

CATANANCHE. *Lin. Gen. Plant.* 824. *Candia* Lions Foot.

The Characters are,

The flower is composed of many hermaphrodite florets, included in one common scaly empalement, which is permanent and elegant. The florets are of one leaf, tongue-shaped, indented in five parts; they have each five short hairy stamina. The germen is situated below the flower, which afterward becomes a single oval seed, which is compressed, and crowned with bristles, inclosed in the empalement.

The Species are,

1. CATANANCHE *squamis calycinis inferioribus ovatis. Hort. Cliff.* 390. Catananche whose under scales of the empalement are oval.

2. CATANANCHE *squamis calycinis inferioribus lanceolatis. Hort. Cliff.* 390. Catananche whose under scales of the empalement are spear-shaped.

The first sort sends out many long, narrow, hairy leaves, which are jagged on their edges, like those of the Buckthorn Plantain, but broader; the jags are deeper, and at greater distances; these lie flat on the ground, turning their points upwards. Between the leaves come out the flower-stalks, which are in number proportionable to the size of the plant; for from an old thriving root, there is frequently eight or ten, and young plants do not send out more than two or

three. These stalks rise near two feet high, dividing into many small branches upward, garnished with leaves like those below, but are smaller, and have few or no jags on their edges: each of these smaller branches (or foot-stalks) are terminated with single heads of flowers, having a dry silvery scaly empalement, in which are included three or four florets, whose petals are broad, flat, and indented at their ends; these are of a fine blue colour, having a dark spot at bottom, and in each five stamina.

The second sort hath broader leaves than the first, and less jagged on their edges: from each root rise one or two stalks, which grow a foot and an half high, sending out two or three slender foot-stalks, each sustaining a single head of yellow flowers, inclosed in a dry scaly empalement, of a darker colour than those of the first.

The first of these plants is perennial, which is propagated by seeds, which may be sown in a bed of common earth in the spring. In the autumn following, the plants may be transplanted where they are to remain. It is a pretty ornament to a garden, and is easily kept within bounds. These plants should remain unremoved, which will cause them to flower better, and they will produce more seeds. The seeds ripen in *August*.

The other sort is an annual plant, and is propagated by seeds, which ripen very well in this country. The time for sowing them is early in *March*, in beds or borders of light earth where they are to remain, and will require no other care but to keep them clean from weeds, and thin the plants where they are too close. These flower in *June*, and perfect their seeds in *August* or *September*.

CATAPUTIA MAJOR. See Ricinus.

CATAPUTIA MINOR. See Euphorbia.

CATARIA. See Nepeta.

CATCH-FLY. See Lychnis.

CATESBÆA. *Lin. Gen. Plant.* 121. *Hist. Carolin.* vol. ii. p. 100. The Lily Thorn.

The Characters are,

The flower is of one leaf, funnel-shaped, having a very long tube, which gradually widens to the top, where it is four-cornered and spread open; it hath four stamina rising in the neck of the tube; the roundish germen is situated under the flower, which afterward becomes an oval berry with one cell, filled with angular seeds.

We know but one Species of this genus, viz.

CATESBÆA. *Lin. Sp. Plant.* 109. The Lily Thorn.

This shrub was discovered by Mr. *Catesby*, near *Nassau* town, in the island of *Providence*, where he saw two of them growing, which were all he ever saw; from these he gathered the seeds, and brought them to *England*.

It rises with a branching stem to the height of ten or twelve feet, covered with a pale russet bark; the branches come out alternately, which are garnished with small leaves, resembling those of the Box tree, coming out in clusters all round the branches, at certain distances; the flowers come out single from the side of the branches, hanging downward; they are tubulous, and near six inches long, very narrow at their base, but widening upward toward the top, where it is divided into four parts which spread open, and are reflexed backward: these are of a dull yellow colour.

This shrub is propagated by seeds, which must be procured from the country where it naturally grows. If the entire fruit are brought over in sand, the seeds will be better preserved; the seeds must be sown in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark. If the seeds are good, the plants will appear in about six weeks; these plants make little progress the first year. If the nights should prove cold, the glasses must be covered with mats every evening. As these plants grow slowly, so they will not require to be removed out of the seed

seed pots the first year, but in the autumn the pots should be removed into the stove, and plunged into the tan bed: in spring the plants should be carefully taken up, and each planted in a separate small pot, filled with light sandy earth, and plunged into a fresh hot-bed of tanners bark. In summer, when the weather is warm, they should have a good share of air admitted to them, but in autumn must be removed into the stove, where they should constantly remain, and must be treated afterward in the same manner as other tender exotick plants.

CAUCALIS, Bastard Parsley.

This is one of the umbelliferous plants with oblong seeds, which are a little furrowed and prickly: the petals of the flower are unequal, and heart-shaped.

There are several *Species* of this plant preserved in the botanick gardens; but as there is no great beauty or use in any of them, I shall pass them over with only observing, that if any person hath a mind to cultivate them, the best season to sow their seeds is in autumn, soon after they are ripe.

CEANOTHUS. *Lin. Gen. Plant.* 237. *Euonymus. Com. Hort. New Jersey* Thea.

The Characters are,

The flower hath five roundish equal petals which spread open, and are less than the empalement; it hath five erect stamina placed opposite to the petals, and a three-cornered germen, which afterward becomes a dry capsule with three cells, in which are lodged three oval seeds.

1. CEANOTHUS *foliis trinerviis. Lin. Sp. Plant.* 195. Ceanothus with leaves having three nerves.

2. CEANOTHUS *foliis lanceolatis enerviis, stipulis subrotundis. Lin. Sp. Plant.* 196. Ceanothus with spear-shaped leaves without nerves, and roundish stipulæ.

3. CEANOTHUS *foliis ovatis venosis sessilibus, floribus singularibus alaribus.* Ceanothus with oval leaves set close to the branches, and single flowers proceeding from the wings of the leaves; commonly called Redwood.

The first sort grows naturally in most parts of *North America*, from whence great plenty of the seeds have been of late years brought to *Europe*, by the title of *New Jersey* Thea. The people of *Canada* use the root in venereal cases.

In *England* this shrub seldom rises more than four or five feet high, sending out branches on every side from the ground upward. These branches are garnished with oval pointed leaves, having three longitudinal veins running from the foot-stalk to the point, which diverge in the broad part of the leaves from each other: the leaves are placed opposite, and are of a light green colour. At the extremity of each shoot the flowers are produced in close thick spikes, which are composed of five small leaves, and are of a clear white; and every shoot is terminated by one of these spikes, so the whole shrub is covered over with flowers. When the autumn proves mild, these shrubs often flower again in *October*. In warm seasons the seeds will ripen pretty well in *England*. But this shrub is best propagated by laying down the young branches, which, in a light soil, will put out roots in a year's time, but these layers should not be much watered; for as the shoots are tender, so moisture will often occasion their rotting, when it is given in quantities, or too often repeated; therefore the best method is to cover the surface of the ground in dry weather, all round the layers with mulch, which will preserve a sufficient moisture in the ground, provided the season is not extremely dry, in which case they should have a little water once in eight or ten days, which will be sufficient.

The best time for laying down these branches is in autumn, and if after this is performed, the surface of the ground is covered over with some old tan, taken from a decayed hot-bed, it will prevent the frost from penetrating of the ground, which will secure them from injury, and

the same covering will prevent the winds from drying of the ground in the spring, and thereby promote their putting out roots. These layers, when rooted, may be taken up the following spring, and planted where they are to remain.

The second sort grows naturally at the *Cape of Good Hope*, from whence it was originally brought to *Holland*, where it has been long known by the title of *Alaternoides*, &c. and by some authors it is titled *Ricinoides Africana arborescens*, &c. but *Dr. Linnæus*, having examined the characters more exactly, has joined it to this genus.

This rises to the height of ten or twelve feet, with a woody stem, covered with a rough purple bark; it sends out many weak branches, which hang downward; they are garnished with oblong pointed leaves, of a lucid green, which are smooth, and slightly sawed on their edges. The flowers are small, of an herbaceous colour, coming out from the side of the branches.

It may be propagated either by layers or cuttings, the latter being a very sure and expeditious method, is generally preferred. The cuttings should be planted in the spring, in a shady border; in about two months, or less, they will have taken root, when they must be taken up, and each planted in a small pot filled with light earth, placing them in the shade till they have taken fresh root. In autumn they must be housed with *Myrtles*, and other more hardy exotick plants, and treated in the same manner.

The third sort grows naturally in the *American* islands; it rises with a shrubby stalk eighteen or twenty feet high, sending out several horizontal branches, which are garnished with oval veined leaves; the flowers come out at the wings of the leaves, with very short foot-stalks; they are of a white herbaceous colour, and are succeeded by dry capsules, shaped like those of the first sort.

This plant requires to be placed in a warm stove, otherwise it will not thrive in *England*; it is propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a separate small pot filled with light sandy earth, and plunged into a hot-bed of tanners bark, observing to shade them till they have taken root; then they must be treated in the same manner as other tender exotick plants. In the autumn they must be placed in the bark stove, and during the winter, must be watered with great caution, for too much moisture at that season will destroy them.

CEDRUS, the Cedar tree of *Barbadoes*, and *Mahogany*, &c.

The Characters are,

The flower is of one leaf, divided at the top into five parts; it hath five short stamina, which adhere at bottom to the germen. In the center is situated the roundish germen, which afterward becomes an oval pod, having five cells, opening from the bottom upward with five valves, having a double cover, the outer being thick and woody, the inner very thin, which immediately surrounds the seeds; these are thick at their base, but upward are flat and thin, like the wings adhering to the seeds of *Firs* and *Pines*.

As the Cedar of *Libanus* is by *Tournefort* very properly referred to the genus of *Larix*, and all the berry bearing Cedars are joined to the *Junipers*, so I have given the title of *Cedrus* to this genus, as the plants were mentioned by imperfect titles by most of the authors who have treated of them; and as the first sort has been generally known by the appellation of Cedar, in the countries where it naturally grows, so the applying of the same name to those plants, which agree in their essential characters with it, will join them properly together.

The Species are,

1. CEDRUS *foliis pinnatis, foliolis multijugatis obtusis, fructu ovali*

ovali glabro. Cedar tree with winged leaves, composed of many pairs of small leaves (or lobes) which are obtuse, and an oval smooth fruit. This is the *Barbadoes* Cedar tree.

2. *CEDRUS foliis pinnatis, foliolis oppositis, glabris, floribus racemosis sparsis.* Cedar with winged leaves, whose lobes are smooth and stand opposite, and flowers growing in loose bunches. This is the Mahogany tree.

3. *CEDRUS foliis alternis simplicibus, cordato-ovatis acutis, fructu pentagono mucronato.* Cedar with single leaves placed alternately, which are oval, heart-shaped, and acute, and have a five-cornered pointed fruit.

The first sort is commonly known under the title of Cedar in the *British* islands of *America*, where this tree grows naturally, and is one of the largest trees of that country. The trunks of these trees are so large, that the inhabitants hollow them, and form them into the shape of boats and periaguas, for which purpose they are extremely well adapted; the wood being soft, it may be cut out with great facility, and being light, it will carry a great weight on the water. The wood has a fragrant odour, from whence the title of Cedar has been given to it. It is often used for wainscoting of rooms, and to make chests, because vermin do not so frequently breed in it, as in many other sorts of wood; this having a very bitter taste, which is communicated to whatever is put into the chests, especially when the wood is fresh, for which reason it is never made into casks, because spirituous liquors will dissolve part of the resin, and thereby acquire a very bitter taste.

This tree rises with a strait stem, to the height of seventy or eighty feet; while young the bark is smooth, and of an Ash colour, but as they advance, the bark becomes rough, and of a darker colour. Toward the top it shoots out many side branches, which are garnished with winged leaves, composed of sixteen or eighteen pair of lobes, (or small leaves) so that they are sometimes near three feet long; the lobes are broad at their base, and are near two inches long, blunt at their ends, and of a pale colour; these emit a rank odour in the summer season, so as to be very offensive. The fruit is oval, about the size of a partridge's egg, smooth, and of a very dark colour, and opens in five parts, having a five-cornered column standing in the middle, between the angles of which the winged seeds are closely placed, lapping over each other like the scales of fishes.

I have received plants of this kind from *Paris*, by the title of *Semiruba*, but whether the root of this tree is, what they use in medicine under that appellation, I cannot say. The seeds of this have also been sent me from the *French* islands in *America*, by the title of *Acajou Cedre*.

It is propagated by seeds, which may be easily procured from the *American* islands, which must be sown upon a hot-bed in the spring, and the plants treated in the same manner as the next.

The second sort is the Mahogany, whose wood is now well known in *England*.

This tree is a native in the warmest parts of *America*, growing plentifully in the islands of *Cuba*, *Jamaica*, and *Hispaniola*; there are also many of them on the *Bahama* islands, but I have not heard of their being found in any of the *Leeward* islands. In *Cuba* and *Jamaica* there are trees of a very large size, so as to cut into planks of six feet breadth; but those on the *Bahama* islands are not so large, though they are frequently four feet diameter, and rise to a great height, notwithstanding they are generally found growing upon the solid rocks, where there is scarce any earth for their nourishment. The wood which has been brought from the *Bahama* islands has usually passed under the appellation of *Madeira* wood, but there is no doubt of its being the same as the Mahogany.

The excellency of this wood for all domestick uses, is

now sufficiently known in *England*; and it is a matter of surprise, that the tree should not have been taken notice of by any historian or traveller, to this time; the only author who has mentioned this tree, is Mr. *Catesby*, in his *Natural History of Carolina and the Bahama islands*, before whom I believe neither the tree or the wood was taken notice of by any writer on natural history, although the wood has been in many years brought to *England* in great quantities.

The leaves of this tree are winged like those of the Ash, having commonly six or eight pair of pinnæ (or lobes) which are shorter and broader at their base than those of the Ash, where they adhere to the midrib, by very short foot-stalks; these lobes are very smooth, having but one vein running through each, which is always on one side, so as to divide them unequally. We have no perfect account of the flower of this tree; those which are exhibited in Mr. *Catesby's Natural History*, were drawn from a withered imperfect fragment, which were the only remains of the flowers, which could be found at the time when he was there; but the fruit he has delineated very exactly, as I have had an opportunity of comparing it with some that have been brought to *England*. The entire fruit, before it opens, is of a brown colour; these fruit grow erect, upon long foot-stalks, which closely adhere to the five-cornered column, running through the middle of the fruit, and to which the seeds are fastened, lying *imbricatim*, like slates on a house, over each other; so that when the fruit is ripe, the outer cover divides at the bottom into five equal parts; and when these fall off, and the seeds are dispersed, the foot-stalk and the column remain some months after on the tree.

It is propagated by seeds, which may be easily procured from the *Bahama* islands, from whence most of the good seeds which have come to *England* were brought; for most of those which have been sent from *Jamaica*, although brought in their pods, have not succeeded, whereas those from the *Bahama* islands have grown as well as if they were immediately taken from the trees; the seeds should be sown in small pots filled with light sandy earth, and plunged into a hot-bed of tanners bark, giving them a gentle watering once a week; if the seeds are good, the plants will appear in a month or five weeks, and when the plants are two inches high, a sufficient number of small pots should be filled with light earth, and plunged into the tan-bed a day or two, that the earth may be warmed before the plants are put into the pots; then the young plants should be shaken out of the pots, and carefully separated, so as not to tear their roots, and each planted in a single pot, being careful to shade them till they have taken fresh root, after which they must be treated in the same manner as other tender plants from the same climate, being careful not to give them much water, especially in winter. If the plants are properly managed, they will make considerable progress; I have some plants now in the *Chelsea* garden eight or ten feet high, which are but of six years growth from seeds.

The third sort was discovered by the late Dr. *Houfston*, at *Campeachy*, from whence he sent the seeds to *England*; which succeeded in several gardens; when the doctor first observed these trees, they were destitute of leaves, but were loaded with ripe fruit; and on his second visit to the place, he found the trees in full verdure, but no appearance of flowers, so he was at a loss to know what genus it belonged to; but as the fruit of this tree agrees exactly with those of the two former species, so I have ventured to join it to them.

These trees usually rise to the height of eighty feet or upward, and divide into many large branches toward the top, which are garnished with leaves, somewhat resembling those of the Witch Hazel, but are broader at their base, and cut angular at their top; these are of an Ash colour underneath, and are set on the branches without any order; the fruit of

this tree is much larger than that of the *Barbadoes* Cedar, being broad at the base, and diminishing gradually to the top, where it terminates in a point, being upwards of two inches long; this has also a column, or woody core, running lengthways through the fruit, to which the winged seeds adhere as in the two former; but as both their fruit are smooth on the outside, this differs from them, in having five angles running from the base upward; at each angle the fruit, when ripe, separates, and exposes the winged seeds, which are dispersed by the winds.

We have no account of the wood of this tree, whether it is ever used in buildings, or for other purposes, as there have been few persons of any curiosity in that country, the cutters of Logwood being the chief people who inhabit there, from whom there can be little known of the produce. The plants which have been raised from the seeds in *England*, have made great progress for the two first years, but afterwards were but slow of growth; for, in six years more, they did not shoot so much as in the first year from the seed, when they grew more than three feet high. This may be managed in the same manner as the two foregoing sorts, and with them constantly kept in the bark stove.

CEDAR of BERMUDAS. See *Juniperus*.

CEDAR of CAROLINA. See *Juniperus*.

CEDAR of JAMAICA. See *Theobroma*.

CEDAR of LIBANUS. See *Larix*.

CEDAR of LYCIA. See *Juniperus*.

CEDAR of PHENICIA. See *Juniperus*.

CEDAR of VIRGINIA. See *Juniperus*.

CEIBA. See *Bombax*.

CELASTRUS. *Lin. Gen. Plant.* 239. *Euonymoides*. *Isnard. Ac. R. Sc.* 1716. The Staff tree.

The Characters are,

The flower hath five oval petals, which are equal, and spread open. It hath five stamina as long as the petals, and a small germen with a large receptacle, marked with ten deep channels, which afterwards becomes an oval, blunt, three-cornered capsule, opening in three cells, each containing an oval smooth seed.

The Species are,

1. *CELASTRUS inermis, foliis ovatis integerrimis.* *Lin. Sp. Pl.* 196. Smooth Staff tree with oval entire leaves.

2. *CELASTRUS inermis, caule volubili.* *Lin. Sp. Pl.* 196. Smooth Staff tree with a twining stalk.

3. *CELASTRUS spinis nudis, ramis teretibus, foliis acutis.* *Hort. Cliff.* 72. Staff tree with naked spines, taper branches, and pointed leaves.

4. *CELASTRUS spinis foliosis, ramis angulatis, foliis obtusis.* *Hort. Cliff.* 73. Staff tree with leaves on the spines, angular branches, and obtuse leaves.

The first sort grows naturally in *Virginia*, and many other parts of *North America*, where it rises to the height of eight or ten feet. It generally puts out two or three stems from the root, which divide upward into several branches, covered with a brown bark, and garnished with leaves near three inches long, which are placed alternately on the branches; the flowers come out on the side of the branches; these are white, made up of five oval petals, with a germen in the center, attended by five stamina; when the flowers fall off, the germen swells to a three-cornered capsule, of a scarlet colour, set full of small protuberances; this opens in three parts, each containing a hard oval seed, covered with a thin red pulp.

It is propagated here by layers, which will take root in one year; the young branches only are proper for this purpose, so that where there is not any of these near the ground, the main stalks should be drawn down, and fastened with pegs to prevent their rising, and the young shoots from them should be laid. The best time for doing this is in autumn, and by that time twelvemonth they will be sufficiently root-

ed, when they should be cut from the old plant, and planted in a nursery for a year or two to get strength, after which they must be removed to the places where they are to remain. This shrub grows naturally in moist places, so will not thrive well in a dry soil.

The second sort sends out several ligneous stalks from the root, which are flexible, and twist themselves about whatever trees and shrubs grow near them; or when they are at a distance from such support, they twine about each other, and rise to the height of twelve or fourteen feet; but when they fall themselves about trees they will grow much taller. These are garnished with oblong leaves, about three inches long, and near two broad, which are sawed on their edges. The flowers are produced in small bunches toward the end of the branches, which are of an herbaceous colour, composed of five roundish petals; these are succeeded by roundish three-cornered capsules, which are red, and, when ripe, spread open in three parts, disclosing the seeds in the same manner as our common Spindle tree. This sends out suckers from the root, so is easily propagated.

The third sort is a native of *Ethiopia*. This rises with an irregular stalk about three or four feet high, sending out several side branches, covered with brown bark, and garnished with leaves about two inches long, and more than half an inch broad, some of which are pointed, and others are obtuse; they are stiff, of a lucid green, and come out irregularly from the branches; these continue green through the year. The flowers are produced from the side of the branches in loose tufts, many of them arising from one point, standing upon long foot-stalks; they are of an herbaceous white colour, composed of five petals, which spread open, and five spreading stamina, which surround a swelling germen, which afterwards becomes an oval fruit, of a fine red colour, which opens in three cells, containing one oblong hard seed, the other two cells being generally abortive.

This plant is commonly propagated by cuttings in *Europe*, which is more expeditious than raising them from seeds, because the seeds rarely come up the first year. The cuttings may be planted any time in summer; but those which are planted early, will have more time to get strength before winter. When they have taken root they must be exposed to the open air, and placed in a sheltered situation; when they are separated, they must be each planted in a small pot filled with good earth, then placed in the shade till they have taken fresh root, after which they may be placed with other exotic plants in a sheltered situation till autumn, when they must be housed with Myrtles, and other of the hardy green-house plants, and will require the same treatment.

The fourth sort grows naturally at the *Cape of Good Hope*, from whence I received the seeds. This rises with a slender ligneous stalk, to the height of ten or twelve feet, covered with a light Ash-coloured bark, and full of joints, which are armed with long spines, upon which grow many small leaves; the branches are slender, and armed with the same spines at every joint, but the whole plant is so weak, as to require some support, without which they would fall to the ground. The leaves come out in clusters, without any order, which are shaped somewhat like those of the narrow leaved Box tree, but are longer, and of a loose texture; the branches are angular, and when young their bark is whitish.

This rises very easily from seeds, and the plants make great progress; for I have raised them four feet high in two years from seeds, without any artificial heat; and some of the plants have lived through two winters against a south-east wall, but these have shed their leaves in winter, whereas those which are removed into the green-house have retained their verdure through the year.

It may be propagated by cuttings, which should be planted in the spring, and treated in the same manner as hath been directed for the former sort; or if the young shoots are laid, they will take root in one year, and may then be transplanted either into pots, or against a good aspected wall, where I find they will endure our ordinary winters without any protection.

CÉLERY, or SALARY. See Apium.

CELOSIA. *Lin. Gen. Plant.* 255. Amaranth.

The Characters are,

The flower hath five erect sharp-pointed petals, which are permanent, stiff, and shaped like a flower cup. It hath a small nectarium joined to the border of the germen, to which adhere the five stamina, which are terminated by turning summits. The empalement afterward becomes a globular capsule with one cell opening horizontally, containing roundish seeds.

The Species are,

1. CELOSIA *foliis lanceolatis, pedunculis angulatis, spicâ ovatâ-oblongâ.* *Lin. Sp. Pl.* 205. Celosia with spear-shaped leaves, angular foot-stalks, and an oval oblong spike.

2. CELOSIA *foliis oblongo-ovatis, pedunculis teretibus substriatis, spicâ oblongâ.* *Lin. Sp. Plant.* 205. Celosia with oblong oval leaves, taper striated foot-stalks, and an oblong spike.

3. CELOSIA *foliis lanceolato-ovatis, paniculâ diffusâ filiformi.* *Flor. Virg.* 144. Celosia with oval spear-shaped leaves, and a slender diffused panicle.

Dr. *Linnaeus* has separated the plants of this genus from the Amaranths, which have been generally joined with them, because those have male and female flowers in the same plants, whereas these have only hermaphrodite flowers; so that by his system, the other are removed to the twenty-first class, and have been before mentioned under the article AMARANTHUS, to which the reader is desired to turn for the *Amaranthus tricolor*, &c.

The first sort here mentioned grows naturally in both *Indies*. This rises with an upright stalk about three or four feet high, garnished with long spear-shaped leaves ending in points, of a pale colour. Toward the upper part of the stalk, there are a few side branches sent out which stand erect; each of which is terminated by a slender spike of flowers, and the principal stalk is terminated by one which is much larger; this is two or three inches long, and about as thick as a man's middle finger, the whole spike being of a silvery colour.

The second sort is well known, by its common appellation of Cockscomb; which was given to it from the form of its crested head of flowers, resembling a cock's comb; of this there are many varieties, which differ in their form, magnitude, and colours; but as they vary from seeds, so they are not enumerated as distinct species. I have raised great varieties of these from seeds which came from *China*, and other countries, but have generally found them alter in a few years, notwithstanding great care has been taken in the saving of their seeds: the principal colours of their heads are red, purple, yellow, and white; but there are some, whose heads are variegated with two or three colours. I also raised some from seeds which I received from *Persia*, whose heads were divided like a plume of feathers, which were of a beautiful scarlet colour.

The third sort grows naturally in some of the sugar islands: it rises with a weak stalk near four feet high, which is garnished with oblong pointed leaves, that stand opposite at each joint, and are pretty far asunder. The flowers come out in loose panicles from the side of the stalks, and also at the end of the branches; these are divided into a great number of very slender spikes, which are of a pale yellow, shining with a gloss like silk. The plants of this perished in the autumn, without perfecting their seeds.

In order to have large fine Amaranths, great care should be taken in the choice of the seeds; for if they are not carefully collected, the whole expence and trouble of raising them will be lost. When you are provided with good seeds, they must be sown on a hot-bed (which should have been prepared a few days before, that the violent heat may be abated); about the beginning of *March* is a good time to sow the seeds, and in less than a fortnight the plants will appear; but as they are tender when they first come up, so they require great care for a few days till they get strength; in giving them a due proportion of air, to prevent their drawing up weak, and then to keep them from too much moisture; for a small share of moisture will cause their tender stems to rot: in sowing of the seeds, there should be care taken not to put them too close, for when the plants come up in clusters, they frequently spoil each other, for want of room to grow. In a fortnight or three weeks time, the plants will be fit to remove, when you must prepare another hot-bed, covered with good rich light earth, about four inches thick; which should be made a few days, that it may have a proper temperature of heat; then raise up the young plants with your finger, so as not to break off the tender roots, and prick them into your new hot-bed about four inches distance every way, giving them a gentle watering to settle the earth to their roots: but in doing this, be very cautious not to bear the young plants down to the ground by hasty watering, which rarely rise again, or at least so as to recover their former strength in a long time, but very often rot in the stems and die quite away.

After the plants are thus planted, they must be screened from the sun till they have taken fresh root; but as there is generally a great steam arising from the fermentation of the dung, which condenses to wet against the glasses, and this dropping upon the plants very frequently destroys them; so the glasses should be frequently turned in the day-time, whenever the weather will permit; but if the weather happens to prove bad that you cannot turn your glasses, it will be of great service to your plants, to wipe off all the moisture two or three times a day with a woollen cloth, to prevent the dropping upon the plants. When your plants are firmly rooted and begin to grow, you must observe to give them air every day (more or less, as the weather is cold or hot) to prevent their drawing up too fast, which greatly weakens their stems.

In about three weeks or a month's time, after these plants have grown so as to meet, they will stand in need of another hot-bed, which should be of a moderate temper, and covered with the same rich earth about six inches thick, in which they should be planted (observing to take them up with as much earth about their roots as possible) planting them seven or eight inches distance every way, giving them some water to settle the earth about their roots; but be very careful not to water them heavily, so as to bear down the plants, (as was before directed) and keep them shaded in the heat of the day, until they have taken fresh root, and be sure to refresh them often (but gently) with water.

In the beginning of *May* you must provide another hot-bed, which should be covered with a deep frame, that your plants may have room to grow: upon this hot-bed, you must set as many three-penny pots as can stand within the compass of the frame; these pots must be filled with good rich earth, and the cavities between each pot filled up with any common earth, to prevent the heat of the bed from evaporating, and filling the frame with noxious steams; then, with a trowel, or some such instrument, take up your plants (from the former hot-bed) with as much earth as possible to the roots, and place each single plant in the middle of one of the pots, filling the pot up with the earth before described, and settle it close to the root of the plant with

with your hands; water them gently, as before, and shade them in the heat of the day from the violence of the sun.

In about three weeks more, these plants will have grown to a considerable size and strength, so that you must now raise the glasses very much in the day-time; and when the air is soft and the sun is clouded, draw off the glasses, and expose them to the open air, and repeat this as often as the weather will permit, which will harden them by degrees, to be removed abroad into the places where they are to remain the whole season: but it is not adviseable to set these plants out until a week in July, observing to do it when the air is perfectly soft, and if possible, in a gentle shower of rain.

Let them at first be set near the shelter of a hedge for two or three days, where they may be screened from the violence of the sun and strong winds, to which they must be inured by degrees: these plants, when grown to a good stature, perspire very freely, and must be every day refreshed with water, if the weather proves hot and dry, otherwise they will stunt, and never produce their plumes so fine as they would do if taken care of.

In the beginning or middle of September, the Amaranths will have perfected their seeds, so that you must make choice of the largest, most beautiful, and least branching plants of each kind for seed; which you should remove under shelter, (especially if the weather proves wet, or the nights frosty) that the seeds may be maturely ripened; and in the choice thereof, be sure never to take any seeds from side branches, nor from the neck of the plume, but such only as are produced in the middle thereof, which in many plants, perhaps, may be but a small quantity; but I do assure you, it is those only you can depend upon, to have your kinds good the succeeding year.

CELSIA. *Lin. Gen. Pl.* 675. We have no English name for it.

The Characters are,

The flower is of one leaf, with a very short tube, spread open above, and cut into five unequal parts; the two upper being small, and the under larger. It hath four hairy stamina, which incline toward the upper segments of the petal. In the center is situated a roundish germen, which afterward becomes a roundish capsule compressed at the top, sitting upon the empalement, and hath two cells which are filled with small angular seeds.

There is but one Species of this genus at present known, which is,

CELSIA *foliis duplicato-pinnatis. Hort. Cliff.* 321. Celsia with double winged leaves.

This plant grows naturally in Armenia, from whence Dr. Tournefort sent the seeds to the royal garden at Paris. In its natural place of growth, this is an annual, but in England it will rarely ripen its seeds, unless the plants come up in the autumn, and live through the winter.

It sends out many oblong leaves, which are finely divided almost to the midrib on both sides; from the center arises a roundish herbaceous stalk two feet high, which is garnished the whole length with leaves of the same shape, but diminishing in their size gradually to the top: these are placed alternately, and at the foot-stalk of each come out the flowers more than half the length of the stalk, which are of an iron colour on their outside, but pale yellow within, spreading open like those of the common Mullen, but are not so regular: the short tube being turned downward, and the lower segments being larger than the upper, and the stamina being unequal, has occasioned Linnæus to remove it to his ringent flowers. The seed vessel is round, compressed, and hath two cells filled with small seeds. It may be sown on a poor dry soil in autumn, and when the plants come up, they will require no other care but to keep them clean from weeds, and thin them if they are too close; for they

do not bear removing well, so should be sown where they are intended to remain.

I have, sometimes when the seasons have proved warm, had ripe seeds from plants sown in the spring; but this cannot be depended on, therefore it is much better to raise the plants in autumn.

CELTIS. *Tourn. Inst. R. H.* 612. *tab.* 383. *Lin. Gen. Pl.* 1012. The Lote, or Nettle tree.

The Characters are,

It hath male and hermaphrodite flowers on the same tree: the hermaphrodite flowers are single, and situated above the male; these have no petals, but five short stamina. In the center is situated an oval germen, which afterward becomes a round berry with one cell, inclosing a roundish nut. The male flowers have their empalements divided into six parts, and have no germen or style, but in other parts are like the hermaphrodite.

The Species are,

1. CELTIS *foliis lanceolatis acuminatis, serratis, nervosis.* Nettle tree with spear-shaped pointed leaves, which are veined and sawed on their edges; or the Lote tree with a black fruit.

2. CELTIS *foliis obliquè-ovatis, serratis, acuminatis. Lin. Sp. Pl.* 1044. Nettle tree with oblique, oval leaves, which are pointed, or sawed on their edges; or Lote tree with a dark purple fruit.

3. CELTIS *foliis ovato-cordatis, denticulatis, petiolis brevibus.* Nettle tree with oval heart-shaped leaves, slightly indented, and short foot-stalks; or the Smaller eastern Lote tree, with smaller and thicker leaves, and a yellow fruit.

4. CELTIS *foliis oblongo-ovatis, obtusis, nervosis, supernè glabris, subtus aureis.* Nettle tree with oblong, oval, obtuse, nervous leaves, which are smooth on their upper surface, and of a gold colour beneath.

The first sort grows naturally in the south of France, in Spain and Italy, where it is one of the largest trees of those countries: yet this is not so plenty in England as the second, nor do I remember to have seen but two large trees of this sort in the English gardens.

This tree rises with an upright stem to the height of forty or fifty feet, sending out many slender branches, which have a smooth dark coloured bark; these are garnished with leaves placed alternately, which are near four inches long, and about two broad in the middle, ending in long sharp points, and deeply sawed on their edges; having several transverse veins, which are prominent on their under side. The flowers come out from the wings of the leaves all along the branches; they have a male and an hermaphrodite flower, generally at the same place, the male flowers being situated above the others: these have no petals, but a green herbaceous empalement, so make no figure; they come out in the spring, at the same time when the leaves make their first appearance, and generally decay before their leaves have grown to half their magnitude. After their flowers are past, the germen of the hermaphrodite flowers become a round berry, about the size of a Pea, which, when ripe, is black.

The second sort grows naturally in North America: it delights in a moist rich soil, in which it becomes a very large tree. This rises with a strait stem, which in young trees is smooth, and of a dark colour, but as they advance, it becomes rougher and of a lighter colour. The branches are much diffused on every side, which are garnished with oblique, oval leaves, ending in points, and sawed on their edges. The flowers come out opposite to the leaves upon pretty long foot-stalks, the male flowers standing above the hermaphrodite, as in the other species; after these decay, the hermaphrodite flowers are succeeded by roundish berries, which are smaller than those of the first sort, and, when ripe, are of a dark purple colour.

This tree is late in coming out in the spring, but in recompense for that, it continues as long in beauty in the autumn, for it is the latest in fading of any of the deciduous trees; nor do the leaves alter their colour long before they fall, but continue in full verdure, till within a few days of their dropping off. There is little beauty in the flowers or fruit of this tree; but as the branches are well clothed with leaves, which are of a fine green colour, so the trees, when mixed with others, in wildernesses, make a pleasing variety during the summer season. The wood of this tree being tough and pliable, is esteemed by coachmakers for the frames of their carriage.

The third sort was discovered by Dr. *Tourrefort* in *Armenia*. It rises with a stem about ten or twelve feet high, dividing into many branches, which spread horizontally on every side, and have a smooth greenish bark; they are garnished with leaves about an inch and a half long, and near an inch broad, inclining to an heart-shape, but are oblique; they are of a thicker texture than those of the common sort, and are of a paler green. They are placed alternate on the branches, and have short foot-stalks. The flowers come out from the foot-stalks of the leaves, in the same manner as the former, and are succeeded by oval yellow berries, which, when fully ripe, turn of a darker colour. The wood of this tree is very white.

These trees are propagated by seeds, which should be sown soon after they are ripe, when they can be procured at that season, for these frequently come up the following spring: whereas those which are sown in the spring, will not come up till a twelvemonth after; therefore it is the best way to sow them in pots or tubs, that they may be easily removed. In summer they must be constantly kept clean from weeds; if the season proves dry, they will require water two or three times a week. In autumn it will be proper to remove the pots, and place them under a hot-bed frame, to shelter them in winter from severe frost; or where there is not that conveniency, the pots should be plunged into the ground, near a wall or hedge; for as the plants, when young, are full of sap, and tender, so the early frosts in autumn frequently kill the upper parts of their shoots; therefore the plants should be either covered with mats, or a little straw or Pease haulm laid over to protect them.

In the following spring the plants should be taken out of the seed pots, and planted in the full ground: this should be done about the middle or later end of *March*, when the danger of the frost is over; therefore a bed or two should be prepared (according to the number of plants raised) in a sheltered situation; and, if possible, in a gentle loamy soil. The ground must be well trenched, and cleared from the roots of bad weeds, and when levelled, should be marked out in lines at one foot distance; then the plants should be carefully turned out of the pots and separated, so as not to tear their roots, and planted in the lines at six inches asunder, pressing the earth down close to the roots. If the ground is very dry when they are planted, and there is no appearance of rain soon, it will be proper to water the beds, to settle the ground to the roots of the plants; and after this, if the surface of the ground is covered with some old tan or rotten dung, it will keep the ground moist, and prevent the drying winds from penetrating to the roots of the plants.

The plants may remain in these nursery beds two years, by which time they will have obtained sufficient strength to be transplanted where they are designed to remain for good; because these plants extend their roots wide every way, so that if they stand long in the nursery, their roots must be cut in removing, which will be a prejudice to their future growth.

These sorts are hardy enough to thrive in the open air in

England, after they have acquired some strength; but for the two first winters after they come up from seeds, they require a little protection, especially the third sort, which is tenderer than either of the former. The young plants of this sort frequently have variegated leaves, but these are more impatient of cold than the plain leaved.

The fourth sort was first discovered by Father *Plumier*, in the *French* islands of *America*; it was also found growing in *Jamaica* by Dr. *Houssoun*, who sent the seeds to *England*. This rises with a strait trunk near twenty feet high, covered with a gray bark, divided into many branches upward, which are garnished with leaves near four inches long, and two and an half broad, rounded at their extremity, of a thick texture, very smooth on their upper surface, and on their under side are of a lucid gold colour, placed alternately on the branches. The fruit is round and red, but the flowers I have not seen.

The seeds of this sort rarely come up the first year, so they should be sowed in pots, and plunged into the tan bed in the stove, where they should remain till the plants come up. These plants must be constantly kept in the bark stove, and treated in the same manner as other tender exoticks.

CENTAUREA. *Lin. Gen. Plant.* 880. Greater Centaury, Knapweed, Blue Bottle, &c.

The Characters are,

It hath a compound flower, whose disk is composed of many hermaphrodite florets, and the border or rays of female florets, which are larger and looser; these are included in a common scaly empalement. The germen is situated under the petal, which afterward becomes a single seed shut up in the empalement. The female florets have a slender tube, but expands above, where it is enlarged, and cut into five unequal parts; these are barren.

The Species are,

1. CENTAUREA *calycibus inermibus globosis, squamis mucronatis, foliis pinnatis decurrentibus subtus argenteis.* Centaury with a globular empalement without spines, sharp pointed scales, and winged running leaves white underneath.

2. CENTAUREA *calycibus inermibus, squamis ovatis obtusis, foliis pinnatis glabris integerrimis.* *Hort. Cliff.* 421. Centaury with an empalement without spines, oval oblong scales, and smooth winged leaves, which are entire; or, Yellow Alpine Centaury.

3. CENTAUREA *calycibus inermibus, squamis ovatis, foliis pinnatis, foliolis serratis decurrentibus.* *Hort. Cliff.* 421. Centaury with an empalement without spines, oval scales, and winged leaves, whose lobes are sawed, and run along the midrib. Greater Centaury.

4. CENTAUREA *calycibus squamosis, foliis indivisis integerrimis decurrentibus.* *Hort. Cliff.* 121. Centaury with a scaly empalement, and undivided entire leaves, running along the stalks.

5. CENTAUREA *calycibus ciliatis oblongis, foliis pinnatifidis linearibus integerrimis.* *Prod. Leyd.* 140. Centaury with oblong hairy empalements, and winged pointed leaves, which are very narrow, and entire.

6. CENTAUREA *calycibus squamosis, foliis tomentosis, radicalibus lanceolatis, coulinis pinnatifidis caule simplici.* *Prod. Leyd.* 142. Centaury with a scaly empalement, woolly leaves, those near the root being spear-shaped, those on the stalk pointed, and a single stalk.

7. CENTAUREA *calycibus serratis, foliis lanceolatis decurrentibus, caule simplicissimo.* *Hort. Cliff.* 422. Centaury with sawed empalements, spear-shaped running leaves, and a single stalk; or, Greater Mountain Blue Bottle.

8. CENTAUREA *calycibus serratis, foliis lineari-lanceolatis decurrentibus, caule simplicissimo.* Centaury with sawed empalements, very narrow spear shaped running leaves, and a single stalk. Narrower and longer leaved *Belgick* Blue Bottle.

9. CENTAUREA

9. *CENTAUREA calycibus inermibus, subrotundis glabris, squamis ovatis, foliis sinuatis.* Hort. Cliff. 421. Centaury with unarmed, roundish, smooth empalements, oval scales, and sinuated leaves; commonly called Sweet Sultan.

10. *CENTAUREA calycibus inermibus, subrotundis, glabris, squamis ovatis obtusis, foliis laciniatis serratis.* Centaury with roundish, smooth, unarmed empalements, oval obtuse scales, and cut leaves, which are sawed on their edges; commonly called yellow Sweet Sultan.

11. *CENTAUREA calycibus serratis, foliis linearibus integerrimis, infimis dentatis.* Hort. Cliff. 422. Centaury with sawed empalements, very narrow entire leaves, indented below; or, Corn Blue Bottle.

12. *CENTAUREA calycibus inermibus, squamis mucronatis, foliis pinnatifidis obtusis decurrentibus.* Lin. Sp. Pl. 910. Centaury with unarmed empalements, having pointed scales, and winged pointed leaves, which are obtuse, running along the stalk.

13. *CENTAUREA calycibus ciliatis terminali-seffilibus, foliis tomentosiss pinnatifidis, lacinulis linearibus.* Hort. Cliff. 422. Centaury with hairy empalements, closely terminating the stalks, woolly leaves with winged points, and the segments very narrow.

14. *CENTAUREA calycibus ciliatis, foliis tomentosiss pinnatifidis, foliolis obtusis ovatis integerrimis exterioribus majoribus.* Hort. Cliff. 422. Centaury with hairy empalements, woolly leaves with winged points, the small leaves oval and obtuse, the outer larger; or, Silvery Knapweed of Ragusa.

15. *CENTAUREA calycibus palmato-spinosis setis æqualibus, foliis decurrentibus sinuatis spinulosis.* Prod. Leyd. 141. Centaury with palmated spinous empalements, whose bristles are equal, and sinuated prickly leaves running along the stalks.

16. *CENTAUREA calycibus squamosis, foliis ovato-oblongis denticulatis integris pctiolatis, subtus tomentosiss.* Hort. Cliff. 421. Centaury with scaly empalements, oval, oblong, indented entire leaves, having foot-stalks, and woolly underneath.

17. *CENTAUREA calycibus setaceo-spinosis, foliis lanceolatis pctiolatis, inferne dentatis.* Hort. Cliff. 423. Centaury with bristly prickly empalements, spear-shaped leaves, with foot-stalks, indented beneath.

18. *CENTAUREA calycibus squama ciliatis, foliis pinnatifidis, pinnis lanceolatis.* Lin. Sp. Pl. 913. Centaury with hairy scales to the empalement, and wing-pointed leaves, whose lobes are spear-shaped.

19. *CENTAUREA calycibus squamosis obtusis, foliis pinnatifidis linearibus integerrimis.* Centaury with an obtuse squamous empalement, and wing pointed, narrow, entire leaves.

20. *CENTAUREA calycibus ciliatis, foliis pinnatifidis brevibus, caule paniculato.* Centaury with hairy empalements, very short wing-pointed leaves, and a paniculated stalk.

There are many other species of this genus, which are preserved in botanick gardens for the sake of variety; some of which grow naturally in England, and are often troublesome weeds in the fields, so do not deserve a place in gardens, therefore I chose not to trouble the reader with mentioning their titles; but have here selected those species, which have some beauty to recommend them.

The first sort grows naturally on the Apennine mountains. This hath a perennial root, which strikes many strong roots deep in the ground: the lower leaves resemble those of the Artichoke; they are green on the upper side, and hoary underneath; the stalks rise about three feet high, and are garnished with leaves of the same form and colour as those below, but are much smaller. The upper part of the stalk branches out into three or four divisions, each being terminated with a large single head of flowers, which are of a purple colour; these are composed of many hermaphrodite flowers, which form the disk in the center, and a bor-

der of female flowers which compose the rays, included in a common scaly empalement, whose scales terminate in acute points. This is usually propagated by parting of their roots: the best time for doing this is early in October, that the plants may have time to take root before the frost comes on. These roots must not be removed or parted oftener than every fourth year, if they are designed to produce strong flowers; they should be planted in a dry soil, because wet in the winter will cause them to rot. This plant is never injured by frost, so may be fully exposed in open borders; but each root will require to have three feet to spread, so they must not be planted too near other plants.

The second sort grows naturally upon the Alps. This hath also a perennial root, which strikes deep into the ground, sending out a great number of long winged leaves, which are smooth, entire, and of a glaucous colour; the stalks rise near four feet high, and divide upward into many branches, which are garnished with small leaves of the same form as the lower; each of these stalks are terminated by a single head of yellow flowers, of the same form with those of the first, but not more than half the size. It may be propagated by parting of their roots, in the same manner as the first, and the plants do require the same treatment.

The third sort stands in the list of medicinal plants of the College, but is very rarely used; the root is reckoned to be binding, and good for all kind of fluxes, and of great use to heal wounds. This grows naturally on the mountains in Italy and Spain; it hath a strong perennial root, like the two former sorts, from which come out a great number of long winged leaves, which spread wide on every side; these are of a lucid green, and sawed on their edges; the flower-stalks are slender, but very stiff, and divide upward into many smaller, which rise six or seven feet high, having at each joint, one small winged leaf, of the same form with the other: each of these stalks is terminated by a single head of purplish flowers, which are considerably longer than the empalement. It may be propagated by parting of the roots, in the same manner as the former sorts, and the plants must be treated in the same way, but should have more room to grow.

The fourth sort was discovered by Dr. Tournefort, in the Levant. This hath a perennial root, which strikes deep into the ground, from which springs up a great tuft of long entire leaves, shaped like those of Woad, they grow upright; there also many upright stalks arise, which grow near five feet high, that are garnished with leaves coming out single at each joint, of the same shape as the under, but are less, and have a border, or wing, running along the stalk, from one to the other. The upper part of the stalk divides into two or three smaller, each of which is terminated by a single head of yellow flowers, included in a silvery scaly empalement. It may be propagated by parting of the roots, in the same manner as the former, and the plants may be treated in the same way, being equally hardy; and as this doth not spread so much as the two last, so it may be allowed a place in smaller gardens.

The fifth sort grows naturally in Austria. This hath a perennial root, as the former, from which come out, in the spring, many winged leaves, which are hoary, and the segments narrow and entire; the stalks rise near three feet high, dividing into several branches, which have a winged leaf at each joint, of the same shape with the other; at the end of each stalk is one head of purple flowers, inclosed in an oblong scaly empalement, each scale being bordered with small hairs, like an eye-brow. This is propagated by seeds, which may be sown in a bed of common earth, in a nursery; and when the plants come up, they must be thinned, and kept clean from weed; and the following autumn

the plants may be transplanted where they are designed to remain.

The sixth sort grows naturally in the south of *France*, and in *Italy*. It hath a biennial root, which doth not divide and spread as the former, but grows single, sending out in the spring, several entire spear-shaped leaves, and afterward a single stalk, more than a foot high, which is garnished at each joint with one divided hoary leaf, and at the top comes out a single, large, scaly head, shaped like a cone of the Pine tree, very taper at the top, where it closely surrounds the florets, whose tops just peep out of the empalement: they are of a bright purple colour, but are not succeeded by seeds in *England*; so cannot be propagated, unless the seeds are procured from abroad.

The seventh sort is the common perennial Blue Bottle, which by some is titled Batchelors Button. This is so well known as to need no description; the roots of this sort creep under ground to a great distance, whereby the plant propagates too fast, and often becomes troublesome in gardens; it will grow in any soil or situation.

The eighth sort differs from the seventh, in having much longer and narrower leaves, which are not so white, the heads of flowers are also smaller; but whether this is only a variety from the other, I cannot determine, having never raised either from seeds; for these plants spread very much by their creeping roots, which renders them barren, as is frequently the case with many other creeping rooted plants, few of which produce seeds. This is equally hardy, so may be planted in any soil or situation, where many other sorts will not thrive, and during its continuance in flower will make a variety in the garden.

The ninth sort is annual, so is only propagated by seeds. This has been many years propagated in the *English* gardens, under the title of Sultan Flower, or Sweet Sultan. This sends up a round channelled stalk, near three feet high, which divide into many branches, garnished with jagged leaves, of a pale green, smooth, and stand close to the branches; from the side of the branches come out long naked foot-stalks, each sustaining a single head of flowers shaped like those of the other species, which have a very strong odour, so as to be offensive to many people, but to others is very grateful; the flowers are in some purple, and others white, and likewise a flesh colour. There is also a variety of this with fistular flowers; and another with fringed flowers, commonly called Amberboi, or Emberboi; but these have degenerated to the common sort in a few years, although I have saved the seeds with great care, so I suppose they are only varieties. These seeds are commonly sown upon a hot-bed in the spring, to bring the plants forward, and in *May* they are transplanted into the borders of the flower garden; but if the seeds are sown on a warm border in autumn, they will live through the winter; and these plants may be removed in the spring into the flower garden, which will be stronger, and come earlier to flower, than those which are raised in the spring. The seeds may also be sown in the spring on a common warm border, where the plants will rise very well, but these will be later in flowering than either of the other.

The tenth sort has been supposed to be only a variety of the former, which is a great mistake; for although there is a great similitude in their appearance, yet they are specifically different. I have cultivated this sort upward of thirty years, and have never observed the least variation in it. This is much tenderer than the former, so the seeds must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be transplanted on a fresh hot-bed, to bring them forward. When the plants have obtained strength, they must be carefully taken up, and planted in separate pots, filled with light earth, and

some of them placed in the shade till they have taken root; then they may be placed with other annual plants in the pleasure garden, where they will continue long in beauty. But as these plants, which are placed in the open air, rarely produce good seeds, so there should be two or three plants kept in a moderate hot-bed, under a deep frame, where they will come earlier to flower; and being protected from wet and cold, they will ripen their seeds every year, which is the surest method to preserve the sort.

The eleventh sort is the common Blue Bottle, which grows naturally amongst the Corn in most parts of *England*; this stands in the list of medicinal plants; there is a distilled water of the flowers, which is esteemed good for the eyes. There are great varieties of colours in these flowers, some of which are finely variegated: the seeds of these are sold by seedsmen by the title of Bottles of all colours. These are annual plants, which will rise in any common border, and require no other care but to keep them clean from weeds, and thinned where they are too close.

The seeds of the twelfth sort were sent me by Dr. *Jussieu*, from *Paris*, who received them from Dr. *Lippi*, at *Grand Cairo*. This is an annual plant, which rises near two feet high, sending out two or three branches toward the top; the leaves are divided into many obtuse parts, and have a border running along the stalk; the flowers are small, of a bright purple, and have a scaly empalement. If the seeds are sown in the spring upon a border of light earth, where the plants are to remain, they will require no farther care but to keep them clean from weeds. It flowers in *July*, and the seeds ripen in autumn.

The thirteenth sort is a perennial plant, which retains its leaves through the year. This grows naturally in *Italy*, on the borders of the fields. The leaves are hoary, and divided into many narrow segments; the stalks rise near three feet high, branching upward into many divisions, each being terminated by a head of purple flowers. This sort will live abroad in moderate winters, if it has a warm situation and a dry soil, but in severe winters the plants are commonly killed; so one or two of them may be sheltered under a common frame in winter to preserve the kind. It may be easily propagated by the young branches, which do not shoot up to flower; if these are cut off, and planted in a shady border, any time in summer, they will take root, and in autumn may be removed to warm borders, or put into pots to be sheltered in winter.

The fourteenth sort grows naturally in *Mauritania*, and in several other places on the borders of the *Mediterranean* sea. This seldom rises more than three feet high in this country; it hath a perennial stalk, that divides into many branches, which are garnished with many white woolly leaves, divided into many obtuse lobes, that are entire; the small leaves, or lobes, on the exterior part of the leaf, being the largest. The flowers are produced from the side branches, upon short foot-stalks, which are of a bright yellow, and are included in a fine hairy empalement. It is propagated by planting of the young shoots in the same manner as the last, and the plants require protection from hard frost.

The fifteenth sort is annual. This grows naturally in the *Archipelago*. It rises with a branching stalk, about three feet high; the lower leaves are not much unlike those of the Turnep, being rounded at their ends, and their base is cut into many parts; those upon the stalks and branches are nearly of the same form, but diminish gradually in their size to the top; these have a border or wing running along the stalks, which connect them together; the flowers are produced at the end of the branches, which have prickly empalements; the spines come out from the border of the scales, divided like the fingers of a hand. The flowers are

of a bright purple, so make a pretty appearance. This fort may be treated in the same manner as the Corn Blue Bottle, by sowing the seeds in autumn, and keeping the plants clean from weeds.

The sixteenth fort grows naturally upon the *Helvetian* mountains. It hath a perennial root, and an annual stalk; the leaves are oblong, slightly indented on their edges, and woolly on their under side; these have much resemblance of those of Elecampane, generally standing upright; the stalks rise little more than a foot high, and are terminated by large single heads of purple flowers, inclosed in scaly empalements. This, like the sixth fort, is very difficult to propagate in *England*, unless goods seeds can be procured from the countries where it naturally grows.

The seventeenth fort grows naturally in *Austria*, and *Hungary*. The lower leaves of this plant spread flat on the ground; they are soft, hairy, and end in sharp points; but toward their base, are cut into several narrow segments; the stalks rise near three feet high, garnished at each joint by spear-shaped leaves, which are entire; and are terminated by single large heads of flowers, of a gold colour, inclosed in a prickly scaly empalement. It hath a perennial root, which sends out offsets; these may be taken from the old plants in autumn, whereby it may be easily propagated. It is very hardy in respect to cold, but should have a dry soil, the roots being very apt to rot in winter with much wet.

The eighteenth fort grows naturally in *Siberia*. This sends out many long winged leaves from the root, which are divided into several spear-shaped lobes; the stalks rise near five feet high, and divide upward into many smaller branches, which are garnished with leaves of the same form with the lower, but are much smaller, and the segments very narrow; each of these is terminated by a head of yellow flowers, inclosed in a scaly empalement; the borders of the scales are set with fine hairs like an eye-brow. This hath a perennial root, and an annual stalk, which, with the leaves, decay in autumn, and arise new from the root in the spring. It may be propagated by either seed, or by parting of the roots, in the same manner as the sixth fort.

The nineteenth fort grows naturally in *Zant*. This is an annual plant, which rises with a slender stalk a foot and an half high, which is garnished with wing-pointed leaves, which are very narrow, and a little hoary; the flowers are small, of a purple colour, and are inclosed in an obtuse scaly empalement.

The twentieth fort came also from the same island with the former. This hath a perennial root, but an annual stalk; the leaves winged, very narrow, and hoary; the stalk rises a foot high, and is garnished with small leaves of the same form; the flowers are purple, and are inclosed in scaly empalements. It flowers in *July*, but seldom ripens seeds in *England*. This must have a dry soil, and a warm situation.

CENTAURIUM MINUS. See *Gentiana*.

CENTINODIUM, Knot Grass. See *Polygonum*.

CEPA, the Onion.

The botanick difference of the Onion, from Garlick, is the swelling pipy stalk, which is much larger in the middle than at either end.

The Varieties of the common Onion are,

The *Straßburgh*. This is the *Cepa oblonga*. C. B. P. 71.

The *Spanish* Onion. This is the *Cepa vulgaris, floribus & tunicis purpurascens*. C. B. P. 71.

The *white Egyptian* Onion. This is the *Cepa floribus & tunicis candidis*. C. B. P. 71.

All these vary from seeds, so that there are several intermediate differences, which are not worth enumerating.

These three varieties are propagated by seeds, which should

be sown the latter end of *February*, or (the beginning of *March*, on good, rich, light ground, which should be well dug and levelled, and cleared from the roots of all bad weeds; then the seeds should be sown, in a dry time, when the surface of the ground is not moist; and where they are intended for a winter crop, they must not be sown too thick. The common allowance of seed is six pounds to one acre of land, but the generality of gardeners sow more; because many of them allow for a crop to draw out, which they call cullings.

In about six weeks after sowing, the Onions will be up forward enough to hoe; at which time (choosing dry weather) you should, with a small hoe about two inches and an half broad, cut up lightly all the weeds from amongst the Onions; and also cut out the Onions, where they grow too close in bunches, leaving them at this first hoeing, at least two or three inches apart. This, if well performed, and in a dry season, will preserve the ground clear of weeds, at least a month; when you must hoe them over a second time, cutting up all the weeds, as before, and also cut out the Onions to a larger distance, leaving them this time four or five inches asunder. This also, if well performed, will preserve the ground clean a month or six weeks longer, when you must hoe them over the third and last time.

Now you must carefully cut up all weeds, and single out the Onions to six inches square, by which means they will grow much larger than if left too close. This time of hoeing, if the weather proves dry, and it is well performed, will keep the ground clean until the Onions are fit to pull up; but if the weather should prove moist, and any of the weeds should take root again, you should, about a fortnight or three weeks after, go over the ground, and draw out all the large weeds with your hands; for the Onions having now begun to bulb, they should not be disturbed with a hoe.

Toward the middle of *August*, your Onions will have arrived to their full growth, which may be known by their blades falling to the ground and shrinking; you should therefore, before their necks or blades are withered off, draw them out of the ground, cropping off the extreme part of the blade, and lay them abroad upon a dry spot of ground to dry, observing to turn them over every other day at least, to prevent their striking fresh root into the ground; which they will quickly do, especially in moist weather.

In about a fortnight's time your Onions will be dry enough to house, which must be performed in perfect dry weather; in doing of this, you must carefully rub off all the earth, and be sure to mix no faulty ones amongst them, which will in a short time decay, and spoil all those that lie near them; nor should you lay them too thick in the house, which would occasion their sweating, and thereby rot them; these should not be put in a lower room, or ground floor, but in a loft or garret; and the closer they are kept from the air, the better they will keep. You should, at least, once a month, look over them to see if any of them are decayed; which if you find, must be immediately taken away, otherwise they will infect all that lie near them.

But notwithstanding all the care you can possibly take in the drying and housing of your Onions, many of them will grow in the loft, especially in mild winters, which are generally moist; therefore those who would preserve them late in the season, should select a parcel of the firmest and most likely to keep, from the others, and with a hot iron slightly singe their beards, or roots, which will effectually prevent their sprouting; but in doing of this there must be great caution used not to scorch the pulp of the Onions, for that will cause them to perish soon after.

In order to save seeds, you must in the spring make choice of some of the firmest, largest, and best shaped Onions (in quantity proportionable to the seed you intend to save); and having prepared a piece of good ground (which should be well dug, and laid out in beds about three feet wide), in the beginning of *March* you must plant your Onions in the following manner. Having strained a line about four inches within the side of the bed, you must, with a spade, throw out an opening about six inches deep, the length of the bed, into which you should place the Onions, with their roots downward, at about nine inches distance from each other, and with a rake draw the earth into the opening again to cover the bulbs; then proceed to remove the line again about a foot farther back, where you must make an opening as before, and so again till the whole is finished; by which you will have four rows in each bed, between each bed you must allow the space of two feet for an alley to go among them to clear them from weeds, &c. In a month's time their leaves will appear above ground, and many of the roots will produce three or four stalks each; you must therefore keep them cleared from weeds, and about the beginning of *June*, when the heads of the flowers begin to appear upon the tops of the stalks, you must provide a parcel of stakes about four feet long, which should be driven into the ground, in the rows of Onions, at about six or eight feet apart, to which you should fasten some pack-thread, rope yarn, or small cord, which should be run on each side of the stems of the Onions, a little below their heads, to support them from breaking down with the wind and rain, for when the seeds are formed, the heads will be heavy; so are very often broken down by their own weight, where they are not well secured; and if the stalks are broken before the seeds have arrived to maturity, they will not be near so good, nor keep so long as those which are perfectly ripened.

About the end of *August* the Onion seed will be ripe, which may be known by its changing brown, and the cells in which the seeds are contained opening; so that if it be not cut in a short time, the seeds will fall to the ground; when you cut off the heads, they should be spread abroad upon coarse cloths in the sun, observing to keep it under shelter in the night, as also in wet weather; and when the heads are quite dry, you must beat out the seeds, which are very easily discharged from their cells; then having cleared it from all the husks, &c. after having exposed it one day to the sun to dry, you must put it up in bags to preserve it for use.

The directions here given is for the general crop of winter Onions, but there are two other crops of this common sort of Onions, cultivated in the gardens about *London* to supply the market, one of which is commonly called *Michaelmas* Onions. These are sown in beds pretty close the beginning of *August*, and must be well weeded when they come up. In the spring of the year, after the winter Onions are over, they are tied up in bunches to supply the markets; but from the thinning of these they carry to market young green Onions in *March*, for sallads, &c.

And in the spring they sow more beds in the same manner, to draw up young for sallads, after the *Michaelmas* Onions are grown too large for that purpose, and where a supply of these are required, there may be three different sowings, at about three weeks distant from each other, which will be sufficient for the season.

There are also the following sorts of Onions cultivated in the kitchen gardens.

The Shallot, or Eschalottes, which is the *Cepa Ascalonica*. *Matth.* 556.

The Ciboule, or *Cepa fistilis*. *Matth. Lugd.* 1539.

The Cives, or *Cepa scitilis juncifolia perennis*. *Mor. Hist.* 2. 383.

The *Welch* Onion I suppose to be the same with the *Ciboule*, although they pass under different appellations, for I have several times received the *Ciboule* from abroad, which, when planted, proved to be what is generally known here by the title of *Welch* Onions.

The Scallion, or Escallion, is a sort of Onion which never forms any bulbs at the roots, and is chiefly used in the spring for green Onions, before the other sorts sown in *July*, are big enough; but this sort of Onion, how much soever in use formerly, is now so scarce as to be known to few people, and is rarely to be met with. The gardeners near *London* substitute another sort for this, which are those Onions which decay and sprout in the house: these they plant in a bed early in the spring, which in a short time will grow large enough for use; when they draw them up, and after pulling off all the outer coat of the root, they tie them up in bunches, and sell them in the market for Scallions.

The true Scallion is easily propagated by parting the roots, either in spring or autumn, but the latter season is preferable, because of their being rendered more fit for use in the spring; these roots should be planted three or four in a hole, at about six inches distance every way, in beds or borders three feet wide, which in a short time will multiply exceedingly, and will grow upon almost any soil, and in any situation.

The Cives are a very small sort of Onion, which never produce any bulbs, and seldom grow above six inches high in the blade, which is very small and slender, and are in round bunches like the former; this was formerly in great request for sallads in the spring, as being milder than the *Welch* Onions. These are propagated by parting their roots like the former, and are also very hardy, and will be fit for use early in the spring.

The *Welch* Onions are only propagated for spring use; these never make any bulbs, and are therefore only fit to be used green for sallads, &c. They are sown about the end of *July*, in beds about three feet and an half wide, leaving alleys of two feet broad to go between the beds to clean them, and in a fortnight's time they will appear above ground, and must be carefully cleared from weeds; towards the middle of *October* their blades will die away, so that the whole spot will seem to be naked, which hath led many people to dig up the ground again, supposing the crop totally lost; whereas, if they stand undisturbed, they will come up again very strong in *January*, and from that time grow very vigorously, resisting all weathers, and by *March* will be fit to draw for young Onions, and were some years past in the markets, more valued than any other sort; for they are extremely green and fine, though they are much stronger than the common Onion in taste, approaching nearer to Garlick, which hath occasioned their being less esteemed for the table: but as no winter, however hard, will hurt them, it is proper to have a few of them to supply the table, in case the common sort should be destroyed by frosts.

The roots of these Onions, if planted out at six or eight inches distance, in *March*, will produce ripe seeds in autumn, but it will be in small quantities the first year; therefore the same roots should remain unremoved, which the second and third year will produce many stems, and afford a good supply of seeds; these roots will abide many years good, but should be transplanted and parted every second or third year, which will cause them to produce strong seeds.

CÉPHALANTHUS. *Lin. Gen. Pl.* 105. Button Wood.

The Characters are,

It hath a number of small flowers, which are collected into a spherical head; each particular flower hath a funnel-shaped empalement, divided into four parts at the top; the flower is funnel-shaped,

shaped, of one petal, divided at the top into four parts, inclosing four stamina, which are inserted in the petal. The germen is situated under the flower, which afterward becomes a globular hairy capsule, inclosing one or two oblong angular seeds; these are joined to an axis, and form a round head.

The Species are,

1. CEPHALANTHUS foliis oppositis ternisque. Flor. Virg. 15. Button tree with leaves growing opposite by threes.

2. CEPHALANTHUS foliis oppositis. Flor. Zeyl. 53. Cephalanthus with leaves growing opposite.

The first sort grows naturally in North America, from whence the seeds are annually sent to Europe, and of late years great numbers of the plants have been raised in the gardens of the curious.

This seldom rises higher than six or seven feet in this country. The branches come out opposite; the leaves also stand opposite, sometimes by pairs, and at other times there are three arising at the same joint; these are near three inches long, and one and a quarter broad, having a strong vein running longitudinally through the middle: they are of a light green, and their foot-stalks change to a reddish colour next the branches; the ends of the branches are terminated by spherical heads, about the size of a marble, each of which are composed of many small flowers, which are funnel-shaped, of a whitish yellow colour, fastened to an axis that stands in the middle.

These plants are propagated chiefly by seeds (though there has been some raised from cuttings;) these seeds should be sown in pots, for the greater conveniency of removing them, either into a shady situation, or where they may have shelter, for they generally remain a year in the ground; therefore, in such case, the pots should be placed in the shade the first summer, and placed the autumn following under a common frame to shelter them from frost, and the spring following the plants will come up.

The first year, when the plants come up, it will be necessary to shade them in hot dry weather while they are young, at which time they are often destroyed by being too much exposed; nor should the watering be neglected, for as these plants naturally grow on moist ground, so when they are not duly watered in dry weather, the young plants will soon decay.

The next autumn, when the leaves begin to drop, they may be transplanted into nursery beds, which should be a little defended from the cold winds; and, if the soil is moist, they will succeed much better than in dry ground; but where it happens otherwise, it will be absolutely necessary to water them in dry weather, otherwise there will be great danger of the plants dying in the middle of summer, which has been the case in many gardens where these plants were raised.

In the nursery beds the plants may remain a year or two (according to the progress they have made, or the distance they were planted); then they may be taken up in October, and transplanted where they are to remain for good. Although I have mentioned but one season for transplanting them, yet this may also be performed in the spring, especially if the ground is moist into which they are removed, or that the plants are duly watered, if the spring should prove dry, otherwise there will be more hazard of their growing when removed at this season.

The second sort grows naturally in Africa, and also in India. This is very rare at present in the English gardens; in the natural places of its growth it becomes a large tree, but the plants which are in Europe, make but little progress. It is tender when young, so requires a stove to preserve it through the winter; but after it obtains strength, it will live in a good green-house. It is very difficult to propagate here, which occasions its scarcity.

CERASTIUM. Lin. Gen. Pl. 518. Mouse-ear, or Mouse-ear Chickweed.

The Characters are,

The flower hath five obtuse bifid petals; it hath ten slender stamina. In the center is situated an oval germen with five styles; the empalement afterward becomes an oval, cylindrical, or globular capsule with one cell, containing many roundish seeds.

The Species are,

1. CERASTIUM foliis lanceolatis, pedunculis ramosis, capsulis subrotundis. Lin. Sp. Plant. 439. Cerastium with spear-shaped leaves, branching foot-stalks; and roundish capsules.

2. CERASTIUM foliis oblongis, tomentosis, pedunculis ramosis, capsulis globosis. Lin. Sp. Plant. 440. Cerastium with oblong woolly leaves, branching foot-stalks, and globular capsules.

3. CERASTIUM foliis lanceolatis, caule dichotomo ramosissimo, capsulis erectis. Prod. Leyd. 450. Cerastium with spear-shaped leaves, a very branching stalk divided in pairs, and upright capsules.

4. CERASTIUM floribus pentandris, petalis integris. Lin. Sp. Plant. 438. Cerastium with flowers having five stamina, and entire petals.

5. CERASTIUM foliis connatis. Hort. Cliff. 173. Cerastium whose leaves are joined.

The first sort grows naturally in France and Italy, and was formerly cultivated in the English gardens under the title of Sea Pink; one of the uses made of it was to plant it as an edging, to keep up the earth of borders; but this was before the Dwarf Box was brought to England, since which all those plants which were formerly applied for this purpose have been neglected. This plant was by no means fit for this use, because its creeping branches would spread into the walks, where they put out roots into the gravel, so that unless they are frequently cut off, they cannot be kept within compass.

This sort sends out many weak stalks which trail upon the ground, and put out roots at their joints, whereby it propagates very fast; the leaves are placed by pairs opposite: these are very hoary; those next the root are much smaller than the upper; the flowers come out from the side of the stalks upon slender foot-stalks, which branch out into several smaller, each supporting a white flower, composed of five petals, which are split at the top.

The seeds of the second sort I received from Istria, where it naturally grows; this is by Parkinson titled hoary narrow-leaved Pink. The leaves of this sort are narrower than those of the former, and are much whiter; the stalks grow more erect, and the seed vessels are rounder, in which their chief difference consists.

The third sort is annual; this grows naturally on arable land in Spain. It is allowed a place in botanick gardens for the sake of variety, but hath not much beauty; this hath branching stalks, which grow about six inches high, dividing by pairs, the flowers coming out in the middle of the divisions, which are shaped like those of Chickweed; the whole plant has a clammy moisture, which sticks to the fingers of those that handle it. If the seeds are permitted to fall, the plants will rise without care.

The fourth sort is very like the third in its whole appearance, and differs from it, in having but five stamina in the flower, whereas the other hath ten.

The fifth sort was discovered by Dr. Tournefort, in the Levant. It is an annual plant, which rises with an upright stalk a foot high; the lower leaves of this plant have much resemblance to those of the Lychnis, which is called Lobel's Catchfly, so that when the plants are young, it is not easy to distinguish them. The stalks are garnished with leaves of the same shape, but smaller; these are placed by pairs, and embrace the stalks at their base. The flowers come out at the top of the stalks, and also from the wings of the leaves,

on the upper part of the stalks, which are white, and shaped like those of Chickweed.

If the seeds of this sort are sown in autumn, they will more certainly grow than those which are sown in the spring; or if the seeds are permitted to scatter, the plants will come up and live through the winter, and will require no other care but to keep them clean from weeds.

CERASUS, the Cherry tree.

The botanical characters of this genus, according to the system of *Linnaeus*, are the same with those of *Prunus*, therefore he has joined the Apricock Cherry, Laurel, and Bird Cherry together, making them only species of the same genus; but those who admit of the fruit, as a character to determine the genus, must separate the Cherry from the others, because they differ greatly in the shape of their stones; but there is a more essential difference in nature between them, which is, that the Cherry will not grow upon a Plum stock, by budding or grafting, nor will the Plum take upon a Cherry stock, and yet we know of no trees of the same genus which do not unite with each other, by budding or grafting.

I shall first enumerate the sorts which are specifically different from each other, and then mention the varieties of these fruits, which are cultivated in the *English* gardens, many of which seem to differ so essentially from each other, that they may be allowed as specific differences; but as I have not had an opportunity of trying the various sorts from seeds, to see if they alter, so I chose to insert them only as varieties, till farther observation may better settle their boundaries.

The Species are,

1. CERASUS *foliis ovato-lanceolatis, serratis*. The common, or *Kentish* Cherry.

2. CERASUS *foliis serratis lanceolatis*. Cherry tree with spear-shaped sawed leaves; or, Black Cherry.

3. CERASUS *foliis ovato-lanceolatis, floribus confertis*. Cherry tree with oval spear-shaped leaves, and flowers growing in clusters; commonly called the Cluster Cherry.

4. CERASUS *floribus corymbosis, foliis ovatis*. *Lin. Sp. Pl.* 474. Cherry tree with flowers growing in round bunches, and oval leaves. The Mahaleb, or perfumed Cherry.

5. CERASUS *foliis lanceolatis, glabris, integerrimis, subtus, caesius, ramis patulis*. Cherry tree with smooth, spear-shaped, entire leaves, of a bluish green on their under side, and spreading branches.

The first sort is the common or *Kentish* Cherry, which is so well known in *England*, as to need no description. From this sort, it hath been supposed, most of the varieties which are cultivated in the *English* gardens have been raised; but as there are very great differences in the size and shape of their leaves, as also in the shoots of the trees, from those of this sort, so I think it is very doubtful, where the boundaries of their specific differences terminate: however, I shall comply with the generality of modern botanists, in supposing the following sorts to have been produced from the seeds of this, as we have not sufficient experiments to determine otherwise.

The Early <i>May</i> Cherry.	The Ox Heart.
The <i>May</i> Duke Cherry.	The Lukeward.
The Archduke Cherry.	The Carnation.
The <i>Flemish</i> Cherry.	The <i>Hertfordshire</i> Heart.
The Red Heart.	The Morello.
The White Heart.	The Bleeding Heart.
The Black Heart.	Yellow <i>Spanish</i> Cherry.
The Amber Heart.	

Two sorts with double flowers, one larger and fuller than the other. These are propagated for ornament.

The second sort is the Black Cherry, which is supposed to be a native of *England*. This grows to be a large tree

fit for timber, and is frequently found growing as such in the woods. From this the only varieties which I have ever known raised by seeds, are the Black Coroun, and the small Wild Cherry; of which there are two or three varieties, which differ in the size and colour of their fruit.

The stones of this sort are generally sown for raising stocks, to graft or bud the other sorts of Cherries upon, being of quicker growth, and of longer duration than either of the other; so are very justly esteemed, and preferred to them.

The wood of the fourth sort, is by the *French* greatly esteemed for making of cabinets, because it hath an agreeable odour. This, and the wood of the Bird Cherry, are often blended together, and pass under the appellation of *Bois de Sainte Lucie*; but the Bird Cherry is the true sort.

The fifth sort was brought from *Canada*, where it grows naturally. This is a low shrub, which seldom grows more than three or four feet high, sending out many horizontal branches, which spread on every side, and are very subject to fall on the ground, where they will put out roots, and thereby multiply. The young branches have a very smooth bark, inclining toward red; the leaves are long, narrow, very smooth, and entire, having the appearance of some sorts of Willow leaves; of a light green on their upper side, but of a bluish, or sea-green, on their under: the flowers come out from the side of the branches, two, three or four arising at the same joint; these are shaped like those of the common Cherry, but are smaller, standing upon long slender foot-stalks. The fruit is like those of the small wild Cherry, but hath a bitterish flavour.

It is easily propagated by laying down the branches early in the spring, which will take root by the following autumn, when they may be taken off, and either planted in a nursery to get strength, or to the places where they are designed to remain. It may also be propagated by sowing of the stones, in the same manner as other Cherries.

All the sorts of Cherries which are usually cultivated in fruit gardens, are propagated by budding or grafting the several kinds into stocks of the black or wild red Cherries, which are strong shooters, and of a longer duration than any of the garden kinds. The stones of these two kinds are sown in a bed of light sandy earth in autumn (or are preserved in sand till spring, and then sowed): these young stocks should remain in these nursery beds till the second autumn after sowing; at which time you should prepare an open spot of good fresh earth, which should be well worked. In this ground, in *October*, you should plant out the young stocks at three feet distance row from row, and about a foot asunder in the rows; being careful, in taking them up from their seed beds, to loosen their roots well with a spade, to prevent their breaking, as also to prune their roots; and if they are inclinable to root downwards, you should shorten the tap root, to cause it to put out lateral roots; but do not prune their tops, for this is what by no means they will endure.

The second year after planting out, if they take to growing well, they will be fit to bud, if they are intended for dwarfs; but if they are for standards, they will not be tall enough till the fourth year; for they should be budded or grafted near six feet from the ground, otherwise the graft will not advance much in height; so that it will be impossible to make a good tree from such as are grafted low, unless the graft is trained upward.

The usual way with the nursery gardeners is, to bud their stocks in summer, and such of them as miscarry, they graft the succeeding spring, (the manner of these operations will be described under their proper heads). Those trees where the buds have taken, must be headed off the beginning of *March*, about six inches above the bud; and when the bud hath shot in summer, if you fear its being blown out by the winds,

winds, you may fasten it up with some bafs, or fuch foft tying, to that part of the flock which was left above the bud. The autumn following thefe trees will be fit to remove; but if your ground is not ready to receive them, they may remain two years before they are tranfplanted; in the doing of which, you muft obferve not to head them, as is by many praftifed; for this, very often, is immediate death to them; but if they furvive it, they feldom recover this amputation in five or fix years.

If thefe trees are intended for a wall, I would advife the planting dwarfs between the ftandards; fo that while the dwarfs are filling the bottom of the walls, the ftandards will cover the tops, and will produce a great deal of fruit: but thefe, as the dwarfs arife to fill the walls, muft be cut away to make room for them: and when the dwarf trees cover the walls, the ftandards fhould be entirely taken away. But I would advife, never to plant ftandard Cherries over other fruits, for there is no other fort of fruit that will prosper well under the drip of Cherries.

When thefe trees are taken up from the nurfery, their roots muft be fhortened, and all the bruifed parts cut off; as alfo all the fmall fibres, which would dry, grow mouldy, and be a great prejudice to the new fibres in their coming forth; you muft alfo cut off the dead part of the flock which was left above the bud, clofe down to the back part of it, that the flock may be covered by the bud. If thefe trees are defigned for a wall, obferve to place the bud direftly from the wall, that the back part of the flock that was cut, may be hid from fight. The foil that Cherries thrive beft in, is a frefh Hazel loam; for if the foil is a dry gravel, they will not live many years, and will be perpetually blighted in the fpring.

The forts commonly planted againft walls are the Early *May*, and *May Duke*, which fhould have a fouth afpected wall. The *Hearts* and common *Duke* will thrive on a weft wall; and in order to continue the *Duke* later in the feafon, they are frequently planted againft north and north-weft afpected walls, where they fucceed very well; and the *Morello* on a north wall, which laft is chiefly planted for preferring. The *Hearts* are all of them ill bearers, for which reafon they are feldom planted againft walls: but I am apt to believe, if they were grafted on the *Bird Cherry*, and managed properly, that defect might be remedied; for this flock (as I am informed) will render Cherries very fruitful; and having the fame effect on Cherries, as the *Paradife* flock hath on Apples, they may be kept in lefs compafs; which is an experiment well worth the trial.

Your trees, if planted againft a wall, fhould be placed at leaft twenty, or twenty-four feet afunder, with a ftandard tree between each dwarf: this will be found a reasonable diftance, when we confider, that Cherry trees will extend themfelves as far, or farther than *Apricocks*, and many other forts of fruit.

In pruning thefe forts of fruit, you fhould never fhorten their fhoots; for the moft part of them produce their fruit buds at their extreme part, which, when fhortened, are cut off, and this often occasions the death of the fhoot: their branches fhould be therefore trained in at full length horizontally, obferving in *May*, where there is a vacancy in the wall, to flop fome ftrong adjoining branches, which will occafion their putting out two or more fhoots; by which means, at that feafon of the year, you may always get a fupply of wood for covering the wall; and at the fame time fhould all foreright fhoots be difplaced by the hand, for if they are fuffered to grow till winter, they will not only deprive the bearing branches of their proper fupply of nourifhment, but when they are cut out, it occasions the tree to gum in that part (for Cherries bear the knife the worft of any fort of fruit trees); but be careful not to rub off the

fides or furs, which are produced upon the two and three years old wood: for it is upon thefe that the greateft part of the fruit are produced, which furs will continue fruitful for feveral years. And it is for want of duly obferving this caution, that Cherry trees are often feen fo unfruitful, efpecially the *Morello*, which the more it is cut, the weaker it fhoots; and, at laft, by frequent pruning, I have known a whole wall of them deftroyed; which, if they had been fuffered to grow without any pruning, might probably have lived many years, and produced large quantities of fruit.

Cherry trees are alfo planted for orchards in many parts of *England*, particularly in *Kent*, where there are large plantations of thefe trees. The ufual diftance allowed for their ftanding is forty feet fquare, at which fpace they are lefs fubject to blight, than when they are clofer planted; and the ground may be tilled between them almoft as well as if it were entirely clear, efpecially while the trees are young; and the often ftirring the ground, provided you do not difturb their roots, will greatly help the trees; but when they are grown fo big as to over-ftadow the ground, the drip of their leaves will fuffer very few things to thrive under them.

The forts beft approved of for an orchard, are the common *Red*, or *Kentifh Cherry*, the *Duke*, and *Lukeward*; all which are plentiful bearers. But orchards of thefe trees are now fcarcely worth planting, except where land is very cheap; for the uncertainty of their bearing, with the trouble in gathering the fruit, together with the fmall price it commonly yields, hath occafioned the deftroying many orchards of this fruit in *Kent*, within a few years paft.

There are fome perfons who graft the *Duke*, and other forts of Cherries, upon the *Morello Cherry*, which is but a weak fhooter, in order to check the luxuriant growth of their trees, which will fucceed for three or four years; but they are not of long duration, nor have I ever feen one tree fo grafted, which had made fhoots above fix or eight inches long; but they were clofely covered with bloffoms, fo may produce fome fruit in a fmall compafs; but thefe are experiments unfit to be carried into general ufe, and only proper to fatisfy curiofity; for is it not much better to allow the trees a greater fhare of room againft the walls, when one tree, fo planted, and properly managed, will produce more fruit than twenty of thefe trees, or twice that number, when they are planted too clofe, though they are grafted upon the *Black Cherry*, or any other free flock?

The *Early*, or *May Cherry*, is the firft ripe; fo one or two trees of this fort may be allowed a place in a garden, where there is room for variety. The next ripe is the *May Duke*, which is a larger fruit than the other, and is more valuable. After this comes the *Archduke*, which, if permitted to hang upon the tree till the fruit is quite ripe, is an excellent Cherry; but few perfons have patience to let them hang their full time, fo rarely have them in perfection; for thefe fhould not be gathered before *Midfummer*, and if they hang a fortnight longer they will be better. This is to be underftood of the fituation near *London*, where they ripen a fortnight earlier than in places forty miles diftant, unlefs they have a very warm fheltered fituation. When this fort is planted againft north walls, the fruit may be continued till the end of *Auguft*, but they muft be protected from the birds, otherwife they will deftroy them.

The *Hertfordfhire Cherry*, which is a fort of *Heart Cherry*, but a firmer and better flavoured fruit, will not ripen earlier than the end of *July*, or the beginning of *Auguft*, which makes it the more valuable, for its coming when the other forts of Cherries are gone.

The *Morello Cherry*, which is generally planted againft walls to a north afpect, and the fruit commonly ufed for preferring,

preserving, or for tarts, yet where they are planted to a better aspect, and suffered to hang upon the trees until they are thoroughly ripe, is a very good fruit for the table; therefore two or three of the trees of this sort should have place where there is plenty of walling, upon a south-west wall, where they will ripen perfectly by the middle or end of *August*, at which time they will be an acceptable fruit.

The Carnation Cherry is also valuable for coming late in the season; this is a very firm fleshy fruit, but is not the best bearer. This sort will ripen very well on *Espaliers*, and by this means the fruit may be continued longer in the season.

The large *Spanish* Cherry is nearly allied to the Duke Cherry, from which it seems to be only a variety accidentally obtained; it ripens soon after the common Duke Cherry, and very often passes for it.

The yellow *Spanish* Cherry is of an oval shape, and of an Amber colour; this ripens late, and is a sweet Cherry, but not of a rich flavour, and being but a middling bearer, is not often admitted into curious gardens, unless where variety is chiefly considered.

The Corone, or Coroun Cherry, is somewhat like the Black Heart, but a little rounder; this is a very good bearer, and an excellent fruit, so should have a place in every good fruit garden. This ripens the middle of *July*.

The Lukeward ripens soon after the Corone Cherry; this is a good bearer, and a very good fruit; it is of a dark colour, not so black as the Corone, and will do well in standards.

The Black Cherry is seldom grafted or budded, but is generally sown for stocks to graft the other kinds of Cherries upon; but where persons are curious to have the best flavoured of this sort of fruit, they should be propagated by grafting from such trees as produce the best fruit. This sort of Cherry is frequently planted in wildernesses, where it will grow to a large size, and, at the time of its flowering, will make a variety, and the fruit will be food for the birds.

The double-flowering Cherry is also propagated for the beauty of the flowers, which are extremely fine, the flowers being as double and large as a Cinnamon Rose; and these being produced in large bunches on every part of the tree, render it one of the most beautiful trees of the spring. Some of the flowers, which are less double, will often produce fruit, which the very double flowers will not; but this defect is sufficiently recompensed in the beauty of its flowers. This is propagated by budding or grafting on the Black or Wild Cherry stock, and the trees are very proper to intermix with the second growth of flowering trees.

CERASUS RACEMOSA. See *Padus*.

CERATONIA. *Lin. Gen. Plant.* 983. The Carob, or St. John's Bread.

The Characters are,

It is male and female in distinct trees. The male flowers have no petals, but have five long stamina. The female flowers have no petals, but a fleshy germen situated within the receptacle, which afterward becomes a long fleshy compressed pod, divided by transverse partitions, each having one large roundish compressed seed.

We have but one Species of this plant, viz.

CERATONIA. H. L. The Carob tree, or St. John's Bread.

This tree is very common in *Spain*, but particularly in *Andalusia*, and in some parts of *Italy*, as also in the *Levant*, where it grows in the hedges, and produces a great quantity of long, flat, brown coloured pods, which are thick, mealy, and of a sweetish taste. These pods are many times eaten by the poorer sort of inhabitants, when they have a scarcity of other food, but they are apt to loosen the belly, and cause gripings of the bowels. These pods are directed by the College

of Physicians to enter some medicinal preparations, for which purpose they are often brought from abroad.

In *England* the tree is preserved by such as delight in exotick plants, as a curiosity; the leaves always continue green, and being different in shape from most other plants, afford an agreeable variety, when intermixed with *Oranges*, *Myrtles*, &c. in the green-house.

It is propagated from seeds, which, when brought over fresh in the pods, will grow very well, if they are sown in the spring in the pots and plunged into a moderate hot-bed. In *June* you must inure them to the open air by degrees, and in *July* they should be removed out of the hot-bed, and placed in a warm situation, where they may remain until the beginning of *October*, when they should be removed into the green-house, placing them where they may have free air in mild weather; for they are pretty hardy, and require only to be sheltered from hard frosts. When the plants have remained in the pots three or four years, and have gotten strength, some of them may be turned out of the pots in the spring, and planted into the full ground, in a warm situation, where they will endure the cold of our ordinary winters very well, but must have some shelter in very hard weather.

CERBERA. *Lin. Gen. Plant.* 260.

The Characters are,

The flower is of one leaf, funnel-shaped, spread open at the top, where it is divided into five large segments; it hath five stamina in the middle of the tube. In the center is situated a roundish germen, which afterward becomes a large, fleshy, roundish berry, divided into two cells, each containing a single, large, compressed nut.

The Species are,

1. CERBERA foliis ovatis. *Lin. Sp. Plant.* 208. Cerbera with oval leaves.

2. CERBERA foliis linearibus, longissimis, confertis. *Lin. Sp. Plant.* 209. Cerbera with very long narrow leaves, growing in clusters.

The first sort grows naturally in the *Brazils*, and also in the *Spanish West-Indies* in plenty; and there are some of the trees growing in the *British* islands of *America*: this rises with an irregular stem, to the height of eight or ten feet, sending out many crooked diffused branches, which toward their tops are garnished with thick succulent leaves, of a lucid green, smooth, and very full of a milky juice. The flowers come out in loose bunches at the end of the branches, which are of a cream colour, having long narrow tubes, and at the top cut into five obtuse segments, which seem twisted, so as to stand oblique to the tube. The wood of this tree stinks most abominably, and the kernels of the nuts are a most deadly poison, so that the *Indians* always caution their children against eating them, for they know of no antidote to expel this poison; nor will any of them use the wood of this tree for fuel, but they take the kernels out of the shells, into which they put small stones, then bore a hole through each shell, and string them; these they tie about their legs to dance with, as the *morris-dancers* use bells.

The second sort grows naturally in the *Spanish West-Indies*, and also in some of the *French* islands in *America*, and hath lately been introduced into the *British* islands.

This rises with a round stalk, about the same height as the former, dividing upward into many branches. These, when young, are covered with a green smooth bark, but as they grow older, the bark becomes rough, and changes to a gray or Ash colour. The leaves are four or five inches long, and half an inch broad in the middle, ending in sharp points; these are of a lucid green, and come out in clusters without order, and are full of a milky juice, which flows out when they are broken. The flowers come out from the

side

side of the branches, upon long foot-stalks, each supporting two or three yellow flowers with long tubes, spreading open in the same manner as the former.

These plants may be propagated from their nuts, which must be procured from the countries where they grow naturally; which should be put into small pots filled with light earth, and plunged into a hot-bed of tanners bark in the spring, and treated in the same manner as other tender exotick seeds, giving them now and then a little water to promote their vegetation. When the plants are come up about two inches high, they should be transplanted each into a separate pot, and plunged again into a hot-bed of tanners bark, observing to shade the glasses in the heat of the day, until the plants have taken new root. As the summer advances, these plants should have air admitted to them, in proportion to the warmth of the season; and when they have filled these small pots with their roots, they should be turned out, and transplanted into pots of a larger size. After they are new potted, they should be plunged into the hot-bed again. When the plants are grown about a foot high, they should have a larger share of air, in order to harden them before the winter, but they should not be wholly exposed to the open air. In the winter these plants should be placed in a warm stove, and during that season they should have very little water given them, especially in cold weather, lest it should rot their roots. These plants will not thrive well unless they are constantly kept in tan; and as they abound with milky juice, so they should be sparingly watered, for they are impatient of moisture, especially during the winter season.

When by any accident the tops of these plants are injured, they frequently put out shoots from their roots, which, if carefully taken up and potted, will make good plants, so that they may be this way increased.

CERCIS. *Lin. Gen. Pl.* 458. The Judas tree.

The Characters are,

The flower hath five petals, which are inserted in the empalement, and greatly resemble a papilionaceous flower. The standard is of one roundish petal, and the keel is composed of two petals. It hath ten distinct stamina, four of which are longer than the rest. It hath a long slender germen, which after-ward becomes an oblong pod with an oblique point, having one cell, inclosing several roundish compressed seeds.

The Species are,

1. *CERCIS foliis cordato-orbiculatis glabris.* *Hort. Cliff.* 156. Cercis with round, heart-shaped, smooth leaves. The common Judas tree.

2. *CERCIS foliis cordatis pubescentibus.* *Hort. Cliff.* 156. Cercis with downy heart-shaped leaves; commonly called *Canada Arbor Judæ*, or Red Bud tree.

The first sort grows naturally in the south of *France*, in *Spain*, and *Italy*. This rises with an upright trunk to the height of twelve or fourteen feet, covered with a dark reddish bark, and divides upward into many irregular branches, garnished with round, heart-shaped, smooth leaves, placed irregularly on the branches, having long foot-stalks. The flowers come out on every side the branches, and many times from the stem of the tree in clusters, arising many from the same point, having short foot-stalks; they are of a very bright purple colour, so make a fine appearance, especially when the branches are covered pretty thick with them, for they come out in the spring with the leaves, so are in full beauty before the leaves have obtained to half their size; these have an agreeable poignancy, so are frequently eaten in fallads. When the flowers fall off, the germen becomes a long flat pod, with one cell, containing one row of roundish seeds, which are a little compressed.

These trees are usually planted with other flowering trees

and shrubs, as ornamental to pleasure gardens; and for their singular beauty, deserve a place, as well as most other sorts, for when they are arrived to a good size, they are very productive of flowers, so as that the branches are often closely covered with them; but the birds peck them off the trees, being inticed thereto by the honey liquor in the empalement. The singular shape of their leaves make a very pretty variety in the summer, after the flowers are past, and are never damaged by insects, so that they are often entire, when many other trees have their leaves almost eaten up. This tree flowers in *May*, when planted in the full air, but against warm walls it is a fortnight or three weeks earlier.

The wood of this tree is very beautifully veined with black and green, and takes a fine polish, so may be converted to many uses.

There are two other varieties of this tree, one with a white, and the other hath a flesh-coloured flower, but these have not half the beauty of the first. *Tournefort* also mentions one with broader pods and pointed leaves, which I believe is only a variety of this.

The second sort grows naturally in most parts of *North America*, where it is called Red Bud, I suppose from the red flower buds appearing in the spring, before the leaves come out; this grows to a middling stature in the places where it is a native, but in *England* rarely rises with a stem to any great height, but branches out near the root. The branches of this are weaker than those of the first sort; the leaves are downy, and terminate in points, whereas those of the first are smooth, and round at the end where they are indented. The flowers of this are also smaller, so do not make so fine appearance as those of the first, but the trees are equally hardy, so will thrive in the open air very well.

These plants may be propagated by sowing their seed upon a bed of light earth, towards the latter end of *March*, or the beginning of *April* (and if you put a little hot dung under the bed, it will greatly facilitate the growth of the seeds); when your seeds are sown, you should sift the earth over them about half an inch thick; and, if the season prove wet, it will be proper to cover the bed with mats, to preserve it from great rains, which will burst the seeds, and cause them to rot; these seeds will often remain till the spring following before they come up, so the ground must not be disturbed till you are convinced that the plants are all come up, for some few may rise the first year, and a greater number the second.

When the plants are come up, they should be carefully cleared from weeds, and in very dry weather must be now and then refreshed with water, which will greatly promote their growth. The winter following, if the weather is very cold, it will be proper to shelter the plants, by covering them either with mats, or dry straw, in hard frosts, but they should constantly be opened in mild weather, otherwise they will grow mouldy, and decay.

About the beginning of *April*, you should prepare a spot of good fresh ground, to transplant these out (for the best season to remove them is just before they begin to shoot;) then you should carefully take up the plants, being careful not to break their roots, and plant them in the fresh ground as soon as possible, because if their roots are dried by the air, it will greatly prejudice them.

The distance these should be planted, must be proportionable to the time they are to remain before they are again transplanted; but commonly they are planted two feet row from row, and a foot asunder in the rows, which is full room enough for them to grow two or three years, by which time they should be transplanted where they are designed to remain; for if they are too

old when removed, they seldom succeed so well as younger plants.

When they have remained in this nursery two or three years, they should be transplanted in the spring where they are designed to remain, which may be in wilderness quarters, among other flowering trees, observing to place them with trees of the same growth, so as that they may not be overhung, which is a great prejudice to most plants.

CEREFOLIUM. See Chærefolium.

CEREUS. Par. Bat. 122. The Torch Thistle.

The Characters are,

The flower is composed of a great number of narrow pointed petals, which spread open like the sun's rays. It hath a great number of declining stamina, which are inserted to the base of the petals. The germen, which is situated under the empalement, afterwards becomes an oblong succulent fruit, with a prickly skin, full of small seeds inclosed in the pulp.

The Species are,

1. CEREUS erectus, sexangularis, longus, angulis distantibus. Tallest upright Torch Thistle of Surinam.

2. CEREUS erectus quadrangularis, angulis compressis. Upright Cereus with four compressed angles.

3. CEREUS erectus octangularis, angulis obtusis, supernè inermibus. Upright Cereus with eight obtuse angles, having no spines on the upper part.

4. CEREUS erectus octangularis, angulis obtusis, spinis robustioribus patulis. Upright Cereus with eight angles which are obtuse, and strong spreading spines.

5. CEREUS erectus novemangularis, obsoletis angulis, spinis lanâ brevioribus. Upright Cereus with nine angles, and spines shorter than the down.

6. CEREUS erectus octangularis, spinis lanâ longioribus. Upright Cereus with eight angles, and spines longer than the down.

7. CEREUS erectus novemangularis, spinis lanâ æqualibus. Upright Torch Thistle with nine angles, and spines of equal length with the down.

8. CEREUS erectus gracilior novemangularis spinis brevibus, angulis obtusis. Slenderer upright Torch Thistle having nine obtuse angles, and short spines.

9. CEREUS repens triangularis, fructu maximo rotundo, rubro, esculento. Creeping triangular Torch Thistle, with a very large, round, red, eatable fruit; commonly called in the West-Indies, the true prickly Pear.

10. CEREUS repens triangularis, angulis compressis. Creeping, triangular Torch Thistle, with compressed angles.

11. CEREUS repens subquingularis. Creeping Torch Thistle with five angles.

12. CEREUS repens decemangularis. Creeping Cereus with ten angles.

The first sort has been the most common in the English gardens. This grows naturally in Surinam.

This rises with an upright stalk, having six large angles, which are far asunder, and are armed with sharp spines, which come out in clusters at certain distances, arising from a point, but spread open every way like a star; the outer substance of the stem is soft, herbaceous, and full of juice, but in the center there is a strong fibrous circle running the whole length, which secures the stem from being broke by winds. This will rise to the height of thirty or forty feet, provided their tops are not injured, if they have room to grow; but some of them have grown too tall to be kept in the stoves, so have been either cut off, or the plants laid down at length in winter; but whenever the stems are cut, or otherwise injured, they put out one, two, or sometimes three shoots, from the angles immediately under the wounded part, and frequently one or two lower down. These shoots, if they are not cut off, form so many distinct stems, and grow upright; but these are seldom so large as the prin-

cipal stem, especially if more than one is left at the same place. The flowers come out from the angles, on the side of the stem; these have a thick fleshy foot-stalk, which is scaly, round, channelled, and hairy, supporting a swelling germen, upon the top of which sits the scaly prickly empalement, closely surrounding the petals of the flowers, till a little time before they expand, which in most of the sorts is in the evening; and their duration is very short, for before the next morning they wither and decay. The flower of this sort is composed of many concave petals, which, when fully expanded, are as large as those of the Holly-hock; the inner petals are white, and are crenated at their extremity. The empalement is green, with some purple stripes; the middle of the flower is occupied by a great number of stamina, which decline in the middle, and rise at their extremities, having roundish summits. The flowers of this kind are never succeeded by fruit in this country; nor do the plants often produce their flowers here, but when they do, there are generally several on the same plant. I have some years had more than a dozen upon a single plant, which have all flowered within a few days of each other.

This sort is not so tender as the others, so may be preserved in a warm green-house, without any artificial heat; but the plants should have no water given them in winter, when they are thus situated; for unless they are placed in a stove, where the moisture is soon evaporated, the wet will occasion them to rot.

The second sort rises with an upright stem like the first, but it hath only four angles, which are compressed, and stand far asunder. This is very subject to put out many shoots from the sides, which stops its upright growth, so that the plants rarely rise more than four or five feet high.

The third, fourth, fifth, sixth, seventh, and eighth sorts, grow naturally in the British islands of America. These have the same form as the first, but differ in the size of their stems, the number of their angles, and the length of their spines, as is before expressed in their titles; but, except the eighth sort, not any of them have flowered in England as yet, though there are many of the plants which are more than twelve feet high: the eighth sort hath the smallest stem of any of the upright sorts which I have yet seen; this hath nine obtuse angles, which are armed with short spines, placed at farther distances than those of the other sorts, nor are the channels between the angles near so deep. The flowers of this are produced from the angles, in the same manner as the first, but are smaller, and the empalement is of a light green, without any mixture of colour. The fruit is about the size and shape of a middling Bergamot Pear, having many soft spines on the skin; the outside is a pale yellow, the inside very white, full of pulp, having a great number of small black seeds lodged in it. This sort frequently flowers in July, and in warm seasons will perfect its fruit, which hath very little flavour in this country.

These sorts are more impatient of cold than the first, so require a stove to preserve them in winter; nor should they be exposed abroad in summer, but kept constantly in the house, giving them a large share of air in warm weather.

The twelfth sort grows naturally in Peru. This is not so tender as the other sorts, so may be preserved in a green-house, or under a good frame, in winter, and in summer should be exposed to the open air, which will prevent the shoots from drawing weak, and thereby a greater number of flowers will be produced; but during the time they remain in the open air, they should have very little water; and if the season should prove wet, the plants should be screened from it, otherwise it will cause them to rot the following winter. This sort produces its flowers in great plenty

plenty in *May*, and sometimes earlier, when the season is warm.

The ninth sort is, by the inhabitants of *Barbadoes*, trained up against their houses, for the sake of its fruit, which is about the bigness of a Bergamot Pear, and of a most delicious flavour. This, and also the tenth, eleventh, and twelfth sorts, are very tender, so require a very warm stove to preserve them. These should be placed against the walls of the stove, into which they will insinuate their roots, and extend themselves to a great length; and with a little help in fastening them to the wall here and there, may be led up about the cieling of the house, where they will appear very handsome. And the eleventh sort, when arrived to a sufficient strength, will produce many exceeding large, beautiful, sweet scented flowers; but they are (like all the flowers of these kinds) of very short duration, scarcely continuing full blown six hours; nor do the same flowers ever open again, when once closed: they begin to open in the evening between seven and eight of the clock, are fully blown by eleven, and by three or four the next morning fade, and hang down quite decayed; but, during their continuance, there is scarce any flower of greater beauty, or that makes a more magnificent appearance; for the calyx of the flower, when open, is near a foot diameter, the inside of which, being of a splendid yellow colour, appears like the rays of a bright star, the outside of a dark brown, and the petals of the flowers being of a pure white, adds to the lustre, and the vast number of recurved stamina, surrounding the style in the center of the flower, make a fine appearance; add to this the fine scent of the flower, which perfumes the air to a considerable distance, there is scarce any plant which deserves a place in the hot-house so much as this, especially as it is to be trained against the wall, where it will not take up room. The usual season of its flowering is in *July*; when the plants are large, they will produce a great number of flowers, so that there will be a succession of them for several nights, and many of them will open the same night. I have frequently had six or eight flowers open at the same time upon one plant, which have made a most magnificent appearance by candle-light, but none of them have been succeeded by any appearance of fruit.

The tenth sort produces a flower little inferior to the former, as I have been informed by persons who have seen them, but I never had the good fortune to have any of these plants which have been under my care flower; nor have I heard of more than two gardens where they have as yet flowered in *England*; the first of them was many years since in the royal gardens at *Hampton-Court*, when there was a curious collection of exotick plants kept in good order in those gardens, which have since been greatly neglected; the other was produced in the gardens of the right honourable the marquis of *Rockingham*, at *Wentworth-Hall*, in *Yorkshire*. These are the only gardens in this country, where I have heard of this sort having produced flowers; although there are many of these plants in several gardens, which are of a considerable age, and extend their branches to a very great distance.

The ninth sort hath never produced any flowers as yet in *England*, nor have we any good figure of the flower in any of the botanick books; but I have been informed by some curious persons who have resided in *America*, that the flowers are not near so beautiful as those of the tenth and eleventh, but the fruit is greatly esteemed by all the inhabitants.

The twelfth sort produces a greater number of flowers than either of the other; these are of a fine Pink colour, both within and without; the petals are not so numerous, and the tube of the flower is longer than those of the other species; and, contrary to all the other sorts, keep open three

or four days, provided the weather is not too hot. During the continuance of these flowers, they make a fine appearance. This sort has very slender trailing branches, which require to be supported; but they do not extend so far as those of the other sort, nor are their branches jointed as those are, so they cannot be trained so far against the walls of the house: but as it produces such beautiful flowers, and in so great plenty, it may be placed among the first class of exotick plants. This plant has produced fruit in the garden at *Chelsea*.

These are all propagated by cuttings, so that if you intend to increase the number of them, you must cut off their stems at what length you please; and the cuttings should be laid in a dry place to heal, at least ten days or a fortnight, before they are planted; but if they lie three weeks it is much the better, and will be in less danger of rotting, especially those sorts which are the most succulent.

These cuttings should be planted in pots filled with the mixture of earth before directed, laying some stones in the bottom of the pots to drain off the moisture; then place the pots into a gentle hot-bed of tanners bark, to facilitate their rooting, giving them once a week or ten days a gentle watering.

The best season for this work is in *June*, or the beginning of *July*, that they may have time to root well before winter; toward the middle of *August* you must begin to give them air by degrees, to harden them against winter, but they should not be wholly exposed to the open air or sun; at the end of *September* they must be removed into the stove, where they are to abide the winter, during which season you must be very careful not to let them have much water; and always observe to place the young plants, for the first winter, in a little warmer situation than the older, as being somewhat tenderer.

When you have once cut off the tops of any of these plants, in order to increase them, the lower parts will put forth fresh shoots from their angles, which, when grown to be eight or nine inches long, may also be taken off to make fresh plants; and, by this means, the old plants will continually afford a supply, so that you never need cut off above one plant of a sort, which you should preserve for to multiply.

These plants being succulent, they will bear to be a long time out of the ground, therefore whoever hath a mind to get any of them from the *West-Indies*, need give no other instructions to their friends, but to cut them off, and let them lie two or three days to dry, then put them up in a box with dry hay, or straw, to keep them from wounding each other with their spines, and if they are two or three months on their passage, they will keep very well, provided no wet get to them.

CERINTHE. *Lin. Gen. Plant.* 171. Honeywort.

The Characters are,

The flower hath one petal, with a thick short tube, and at the brim is quinquefid; it hath five short stamina. In the bottom are situated four germen, two of which afterward become so many seeds, which are hard, smooth, plain on one side, but convex on the other, and are inclosed in the empalement.

The Species are,

1. CERINTHE *foliis ovato-oblongis, asperis, amplexicaulibus, corollis obtusiusculis, patulis*. Honeywort with oval, oblong, rough leaves, embracing the stalk, and spreading blunt petals.

2. CERINTHE *foliis oblongo-ovatis, glabris, amplexicaulibus, corollis obtusiusculis, patulis*. Honeywort with a purplish red flower.

3. CERINTHE *foliis amplexicaulibus, integris, fructibus geminis, corollis acutis, clausis*. *Lin. Sp. Plant.* 137. Smaller Honeywort.

4. CERINTHE *foliis amplexicaulibus emarginatis, fructibus geminis, corollis acutis clausis. Lin. Sp. Pl. 137.* Honeywort, or Greater Mountain Hounds Tongue.

5. CERINTHE *foliis lanceolato-linearibus, hispida, seminibus quaternis distinctis. Hort. Cliff. 48.* Honeywort with narrow spear-shaped leaves, which are set with prickly hairs, and four distinct seeds; or, Greater Yellow Alkanet.

The first sort grows naturally in *Germany* and *Italy*. It is an annual plant, with smooth branching stalks a foot and an half high, garnished with oval, oblong, prickly leaves, which are of a sea-green, spotted with white, and embrace the stalks with their base; the flowers are produced at the end of the branches, standing between the small leaves; these are long, tubulous, and blunt at the top, where the tube is greatly enlarged; they are yellow, and have a mellifluous liquor in their tubes, with which the bees are much delighted; these flowers have each four embryos, or germen, but only two of them are fruitful. If the seeds are not taken as soon as they change black, they drop out of the empalement in a short time, so unless they are carefully gathered up, they will vegetate with the first moist weather.

The second sort is like the first, but the leaves are larger, and smooth, having no prickles on them. The flowers of this are of a purplish red colour, and the plants grow larger. This grows in *Italy*, and the south of *France*; it is also an annual plant.

The third sort grows naturally on the *Alps*, and other mountainous places; it hath slenderer stalks than either of the former, which rise two feet high; the leaves embrace the stalks with their base, and are of a bluer green colour. The flowers are small, their upper part is deeply cut into five segments, but the mouth of the tube is closely shut up. If the seeds of this are permitted to scatter, the plants will come up in autumn, and these will grow much taller, and flower earlier than those which are sown in the spring.

The fourth sort is very like the third, but the leaves are not spotted, and they are indented at their ends. The flowers are smaller, not so deeply cut at the top, and the segments are more acute.

The fifth sort grows naturally in *Austria*, *Hungary*, and in *Italy*; this hath long, narrow, thick leaves, which are covered closely with rough prickly hairs, and spread upon the ground; between these come out the stalk, which rises a foot high, garnished at each joint with one leaf of the same sort, but smaller, which are placed alternately on the stalks; toward the upper part the stalks branch out into two or three smaller, upon which the flowers stand between the leaves, and form a short reflexed spike, like the true Alkanet. The flowers are of a pale yellow, and are shaped like those of the other sorts, but are smaller.

There are two other varieties of the first sort, which differ only in the colour of their flowers, so are not constant.

The several varieties of this plant are propagated by seeds, which should be sown soon after they are ripe; for, if they are kept till spring, the growing quality of some of them is often lost; the plants are hardy, and if the seeds are sown in a warm situation, they will endure the winter's cold very well without shelter; these autumnal plants are also much surer to produce ripe seeds than those which are sown in the spring, which are generally late in the season before they flower; and consequently, if the autumn should not prove very warm, their seeds would not be perfected.

CESTRUM. *Lin. Gen. Pl. 231.* Bastard Jasmine.

The Characters are,

The flower is funnel-shaped, of one petal, having a long cylindrical tube, which spreads open at the top, and is cut into five equal segments; it hath five slender stamina. The oval cylindrical germen is situated in the empalement, which afterward becomes an oval oblong berry, with one cell, inclosing several roundish seeds.

The Species are,

1. CESTRUM *floribus pedunculatis. Hort. Cliff. 490.* Cestrum with flowers standing upon foot-stalks.

2. CESTRUM *floribus sessilibus. Hort. Cliff. 491.* Cestrum with flowers sitting close to the branches.

3. CESTRUM *foliis lanceolatis oppositis nervis transversalibus, pedunculis ramosis.* Cestrum with spear-shaped leaves growing opposite, having transverse veins, and branching foot-stalks to the flowers.

4. CESTRUM *foliis ovato-lanceolatis, floribus spicatis, alaribus & terminalibus.* Cestrum with oval spear-shaped leaves, and flowers growing in spikes from the sides and tops of the branches.

5. CESTRUM *foliis oblongo-ovatis, obliquis, floribus alaribus confertis, tubo longissimo & tenuissimo.* Cestrum with oblong oval leaves which are oblique, and flowers growing in clusters from the sides of the branches, with a very long, slender tube.

6. CESTRUM *foliis lanceolatis obliquis, floribus alaribus, pedunculis foliosis.* Cestrum with oblique spear-shaped leaves, flowers proceeding from the sides of the branches, and leafy foot-stalks.

The first sort was many years past raised in the curious gardens of the dukes of *Beaufort*, at *Badmington*, in *Gloucestershire*, and was from thence communicated to several gardens in *England* and *Holland*, where in the latter it passes under the title of *Badmington Jasmine* to this time. This grows naturally in the island of *Cuba*, from whence I received the seeds by the title of *Dama de Noche, i. e.* Lady of the Night, which appellation I suppose was given it from the flowers sending out a strong odour after the sun is set.

It rises with an upright stalk about six or seven feet high, covered with a grayish bark, and divides upward into many slender branches, which generally incline to one side; these are garnished with leaves placed alternate, which are near four inches long, and one and an half broad, smooth on their upper side, of a pale green, and on their under side they have several transverse veins, standing on short foot-stalks. The flowers are produced at the wings of the leaves in small clusters, upon short foot-stalks, each sustaining four or five flowers, which have very short empalements, with long slender tubes, which are enlarged at the top, where they are cut into five parts which are reflexed; these are of an herbaceous colour.

The seeds of the second sort were sent me from the *Havannah*, by the title of *Dama de Dio*, or Lady of the Day; this rises with an upright stalk to the height of eight or ten feet, covered with a smooth light green bark, and divides upward into many smaller branches, garnished with smooth leaves near three inches long, and one and an half broad, of a lively green colour; these are ranged alternately on the branches. Toward the upper part of the shoots come out the flowers from the wings of the leaves, standing in clusters close to the branches; they are very white, shaped like those of the former sort, and smell sweet in the day time, from whence it had the appellation of Lady of the Day.

The third sort was sent me from *Carthagena* in *New Spain*, near which place it grows naturally; this rises with a shrubby stalk five or six feet high, covered with a brown bark, and divides upward into many small branches, garnished with spear-shaped leaves, about four inches long, and little more than one broad; they are smooth, of a light green, and have many horizontal veins running from the midrib to the sides, and are placed opposite by pairs. From the wings of the leaves, toward the upper part of the branches, are produced the flowers, standing upon branching foot-stalks, each sustaining four or five flowers, whose tubes are swelling at their base, just above the empalement, but contract

tract upward to the mouth, where the petal is cut into five broad segments which spread flat; they are white, but without scent.

The fourth sort was sent me from *Carthage*, with the former. This rises with a shrubby stalk, ten or twelve feet high, covered with a light gray bark, sending out many branches the whole length, garnished with oval spear-shaped leaves, standing without order; they are two inches and an half long, and one and an half broad, of a light green, with slender foot-stalks. The flowers come out in loose spikes from the side, and also the end of the branches, which are shaped like those of the first sort, and are of a whitish green colour, without scent.

The fifth sort rises with several shrubby stalks, which grow eight or ten feet high, covered with a white smooth bark, and send out many irregular branches, which are garnished with oblong oval leaves, which at their base are longer on one side, so that the foot-stalk is oblique; they are placed on the branches without order, and are of a pale green. The flowers come out in clusters from the side of the branches, many of them arising from the same point; these have very slender long tubes, which are cut at the top into five acute segments which are erect. These are of a pale yellow, and without scent.

The sixth sort grows naturally in *Jamaica*. This rises with a woody stem eight or nine feet high, covered with a smooth whitish bark, sending out many branches toward the top, which are garnished with spear-shaped leaves, whose foot-stalks are oblique; they are three inches long, and little more than one broad, smooth, of the consistence with Bay leaves, and are placed alternate on the branches. From the wings of the leaves the flowers are produced; the foot-stalks of the flowers are garnished with small leaves, standing between each flower in a singular manner, the flowers rising one above the other, and between, or opposite to each, is one, and sometimes two-leaves of the same form with those on the branches. The flowers are of a pale yellow, and emit a disagreeable odour.

All these plants grow naturally in very hot countries, so cannot be preserved in *England* without artificial heat; therefore require to be placed in a warm stove, especially in the winter. The two first are hardier than the others; these I have kept several years in a dry stove, with a moderate share of heat in winter, and in the middle of summer have set them in the open air, in a warm situation. With this management I have found them thrive, and produce flowers much better than when they have been placed in a greater heat; but I have often endeavoured to keep these plants through the winter, in a green-house, or a glass case, without fire, but could never succeed, for by the end of *January* they commonly decayed.

These plants may be propagated either by seeds, or cuttings. Those which come from seeds are always the most vigorous, and straightest plants; but as they do not produce seeds in *England*, so the other method is generally practised, because their seeds are rarely brought hither.

The best time to plant these cuttings, is about the end of *June*, by which time the shoots will have had time to recover their strength, after their confinement during the winter season. The shoots which come out from the lower part of the stalks, should always be chosen for this purpose. These should be cut about four inches long, and five or six of them may be planted in one halfpenny pot, for the cuttings of most sorts of exotick plants, will succeed better when they are planted in these small pots, than they do in larger, as I have many years experienced. When the cuttings are planted, the earth must be pressed pretty close to them, and then gently watered; after which the pots must be plunged into a moderate hot-bed of tanners bark, and shaded from the

sun. With this management the cuttings will put out roots in a month or six weeks, when they should be gradually exposed to the sun, and when they begin to put out shoots, they must have a greater share of fresh air admitted to them, to prevent their drawing up weak. When they have made good roots, they should be carefully shaken out of the pots, and each put into a separate small pot; then give them some water, to settle the earth to their roots, and plunge them again into the tan bed; observing if any of their leaves hang down, to shade them from the sun in the middle of the day, until they have taken fresh root; after which they should have a large share of air in warm weather, to strengthen them before winter.

In the autumn the plants must be removed into the bar's stove, and plunged into the tan bed, where they must be treated in the same manner as other tender exotick plants; for although the two first sorts may be treated otherwise when they have obtained strength, yet in the first winter they may be managed in the same way as the others. There must be great care had in watering of these plants in winter, for they are all (except the second sort) very impatient of moisture; so that they are soon killed by being over watered.

If the seeds of these are procured from the countries where they grow naturally, they should be sowed in small pots, and plunged into a moderate hot-bed of tanners bark, giving them now and then a little water. Sometimes the seeds will come up the same year, but they very often lie in the ground till the spring following; so that if the plants do not appear in six or seven weeks after the seeds are sown, they will not come up that season; in which case the pots may be plunged in the tan bed of the stove, between the other plants, where they will be shaded from the sun, and but little water given them; in this situation they may remain till the following spring, when they should be removed, and plunged into a fresh hot-bed, which will bring up the plants in a short time, provided the seeds were good.

CETERACH. See *Asplenium*.

CHÆROPHYLLUM. *Lin. Gen. Pl.* 320. Chervil.

The Characters are,

It is a plant with umbellated flowers; the principal umbel is spreading, and composed of several small ones, called rays; the flowers have five heart-shaped inflexed petals, and five stamina. The germen is situated below the flower, supporting two reflexed styles, which afterward becomes an oblong pointed fruit, dividing in two parts, each having one seed, which is convex on one side, and plain on the other.

The Species are,

1. CHÆROPHYLLUM *flosculis omnibus fertilibus, caule æquali. Lin. Sp. Plant.* 258. Wild Myrrh with smooth seeds.
2. CHÆROPHYLLUM *caule lævi, geniculis tumidis. Lin. Sp. Pl.* 258. Chervil with a smooth stalk, and swelling knots.
3. CHÆROPHYLLUM *caule scabro, geniculis tumidis. Lin. Sp. Pl.* 258. Wild Chervil.
4. CHÆROPHYLLUM *caule æquali, foliolis incisus acutis. Lin. Sp. Plant.* 258. Chervil with an equal stalk, and leaves cut into acute segments.
5. CHÆROPHYLLUM *feminibus lævibus, umbellis ad nodos sessilibus. Bahm. Lips.* 492. Garden Chervil.

The first sort grows naturally on the side of highways, and the borders of the fields in most parts of *England*, so is never cultivated in gardens. It is frequently called Cow Parsley, but for what reason I cannot say, because there are few animals who care to eat it, except the ass, for it is reckoned to have something of the quality of Hemlock, but in a less degree. It is a weed which should be rooted out from all pastures early in the spring, for it is one of the most early plants in shooting, so that by the beginning of *April*, the leaves are near two feet high.

The second sort grows naturally in *Hungary* and *Istria*; this plant hath a thick tuberous root, from which come forth several leaves resembling those of Wild Chervil. The stalks rise seven or eight feet high, which are spotted with purple, and are garnished with leaves of the same form as those below. The knots at the joints of the stalks swell out on every side, at which is placed one of these divided leaves, and the stalks are terminated by small umbels of white flowers, which are succeeded by long narrow seeds. If the seeds of this plant are permitted to scatter, the plants will come up without any farther care, and only require to be kept clean from weeds.

The third sort grows naturally on the sides of foot walks, and on the borders of woods in many parts of *England*, so is not cultivated in gardens.

The fourth sort grows naturally in the pastures about *Geneva*, and in *Switzerland*; this hath a perennial root, the leaves are shaped like those of the first, but are broader, hairy, and more divided. The stalks rise three feet high, which are channelled, and are terminated by large umbels, formed of many small ones, which are composed of white or red flowers, sometimes both colours in the same umbel, having five heart-shaped petals, which turn inward; these are succeeded by two long pointed seeds; the whole plant has an aromattick smell and taste.

The fourth sort is the Garden Chervil, which was formerly much more cultivated in the *English* gardens, than at present; it is an annual plant, which perishes soon after the seeds are ripe. The best time to sow the seeds is in autumn, soon after they are ripe, for those which are sown in the spring do rarely come up, and, if they do, the plants seldom thrive; for as soon as the warm weather sets in, these soon wither and decay; but the plants which rise in autumn, continue green all the winter, and in *April* they flower, soon after which the seeds ripen, and the whole plants decay.

The leaves of this plant are frequently used in soups in the winter and spring, but especially by the *Dutch*, who are great lovers of this herb; but whoever makes use of it should be cautious not to take the leaves of the Annual Myrrhis, instead of this, as some of the *Dutch* soldiers who were in *England* in 1745, did, some of whom were poisoned with it.

It will thrive on any soil, or in any situation. The seeds may be either sown in drills, or broad-cast, and require no particular culture, so may be treated in the same way as Parsley.

CHAMÆCERASUS. See *Cerasus* and *Lonicera*.

CHAMÆCISTUS. See *Helianthemum*.

CHAMÆCLEMA. See *Glechoma*.

CHAMÆCYPARISSUS. See *Santolina*.

CHAMÆDAPHNE. See *Ruscus*.

CHAMÆDRYS. See *Teucrium*.

CHAMÆLÆA. See *Cneorum*.

CHAMÆMELUM. See *Anthemis*.

CHAMÆMESPILUS. See *Mespilus*.

CHAMÆMORUS. See *Rubus*.

CHAMÆNERION. See *Epilobium*.

CHAMÆPITYS. See *Teucrium*.

CHAMÆRHODODENDRON. See *Rhododendron*, *Azalea* and *Kalmia*.

CHAMÆRIPHES. See *Chamærops*.

CHAMÆROPS. *Lin. Gen. Plant.* 1084. Dwarf Palm, or Palmetto.

The Characters are,

It hath male and hermaphrodite flowers in distinct plants; the hermaphrodite flowers are all included in one common spathe; the spadix, or club, is branching; each flower hath a small three pointed empalement, and one thick upright petal, which is cut into three parts, with five compressed stamina which join at their base.

They have three roundish germen, which afterward become so many round berries, having one cell, each containing a single seed. The male flowers are like the hermaphrodite, but the stamina are not distinct, nor have they any germen.

The Species are,

1. CHAMÆROPS *frondibus palmatis, plicatis, stipitibus spinosis.* *Hort. Cliff.* 482. Dwarf Palm with folding palmated leaves, and prickly foot-stalks.

2. CHAMÆROPS *foliis flabelliformibus, maximis, stipitibus glabris.* Dwarf Palm with very large fan-shaped leaves, and smooth foot-stalks; commonly called small Palmetto Royal.

The first sort grows naturally in *Spain*, particularly in *Andalusia*, where, in the sandy land, the roots spread and propagate so fast, as to cover the ground in the same manner as the Fern in *England*. The leaves of these plants are tied together to make besoms for sweeping.

This never rises with a stem, but the foot-stalks of the leaves rise immediately from the head of the root, and are armed on each side with strong spines, they are flat on their upper surface, and convex on the under; to their ends the center of the leaves are fastened, which spread open like a fan, having many foldings, and at the top are deeply divided like the fingers of a hand. The bezlers of the leaves are finely sawed, and have white narrow edgings; these leaves spread out on every side of the plant, they are from nine to eighteen inches long, and near a foot broad in their widest part; as the lower leaves of the plants decay, so their vestiges remain, and form a short stump above ground, in the same manner as our common male Fern does; from between the leaves come out the spadix, or club, which sustains the flowers; this is covered with a thin spathe, or hood, which falls off when the bunches open and divide. As all the plants of this sort which I have seen flower were male, so I cannot give any particular description of their fructification.

These plants are best propagated by seeds, which should be sown in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark. If the seeds are fresh, the plants will come up in six weeks, or two months; these rise with a single long pointed leaf. If the plants are not too close to each other in the pots, they will not require to be transplanted the first year, therefore they should remain in the tan bed all the summer, but in warm weather they must have plenty of air admitted to them. In autumn the pots should be removed into the stove, and, if they are plunged into the bark bed the first winter, it will greatly forward the growth of the plants. The following spring the plants should be carefully turned out of the pots, so as to preserve their roots entire, for all the sorts of Palms have tender roots, which, if they are cut off, or broken, frequently kills the plants; then they should be each planted into a separate small pot, and plunged into a fresh hot-bed, to encourage their taking root; the following summer they should be gradually hardened, by raising the glasses pretty high, so as to admit a large share of air to them, but they should not yet be wholly exposed to the open air. The autumn following the plants may be placed in a dry stove, but as the plants advance and get strength, they may be treated more hardily, and in summer placed in the open air in a warm situation, and in winter may be preserved in a warm green-house without artificial heat.

As the plants advance in growth, so they should be put into larger pots; but when this is done, there must be great care taken, that their roots are not cut or broken, nor should they have pots too large. In winter they must have but little water, and if they are exposed to the open air in summer, they will not require much, unless the season proves very warm and dry, in which case they may be sparingly watered two or three times a week.

The second sort grows naturally in the *West-Indies*, where it never rises with a tall stem; the foot-stalks of the leaves are rounder than those of the former, and have no spines on their sides. When the plants are old their leaves are three or four feet long, and upward of two broad; these are folded in the same manner as those of the first, but the folds are broader, and the leaves are of a darker green; some of these plants have put out slender bunches of male flowers in *England*, which were too imperfect to form a description.

This sort rises freely from seeds, which may be easily procured from the islands in *America*; these must be sown in the same manner as the former, and the plants treated in the same way, but as they are natives of a warmer climate, so they should be constantly kept in the bark stove, where, if they are carefully managed, they will make good progress.

CHAMÆRUBUS. See Rubus.

CHAMÆSYCE. See Euphorbia.

CHEIRANTHUS. *Lin. Gen. Plant.* 730. Stock Gilliflower and Wall-flower.

The Characters are,

The flower hath four petals in form of a cross; it hath six parallel stamina, two of which are between the swelling leaves of the empalement, the other are a little shorter. It hath a four-cornered prismatic germen, which afterward becomes a long compressed pod with two cells, opening with two valves, filled with compressed seeds.

The Species are,

1. CHEIRANTHUS *foliis lineari lanceolatis serratis caule erecto, siliquis tetragonis*. Cheiranthus with narrow, indented, spear-shaped leaves, an upright stalk, and four-cornered pods.

2. CHEIRANTHUS *foliis lanceolatis integerrimis, caule erecto, siliquis tetragonis*. Cheiranthus with spear-shaped entire leaves, an upright stalk, and quadrangular pods.

3. CHEIRANTHUS *foliis lanceolatis, acutis, glabris*. *Hort. Cliff.* 334. Cheiranthus with spear-shaped, pointed, smooth leaves; or, Wall-flower.

4. CHEIRANTHUS *foliis linearibus, unguibus petalorum calyce longioribus*. Cheiranthus with narrow leaves, and the necks of the petals longer than the empalement.

5. CHEIRANTHUS *foliis lanceolatis, subdentatis, obtusis, incanis, siliquis cylindricis apice acutis, caule herbaceo*. *Lin. Sp. Plant.* 662. Cheiranthus with spear-shaped leaves, somewhat indented, obtuse, and hoary; cylindrical pods with acute points, and an herbaceous stalk; commonly called the Ten Weeks Stock.

6. CHEIRANTHUS *foliis lanceolatis, integerrimis, obtusis, incanis, siliquis apice truncatis, compressis, caule suffruticoso*. *Hort. Upsal.* 187. Cheiranthus with very entire spear-shaped leaves, which are obtuse and hoary, compressed pods with truncated points, and a shrubby stalk; commonly called the Queen's Stock Gilliflower.

7. CHEIRANTHUS *foliis lanceolatis undatis, caule erecto indiviso*. Cheiranthus with waved spear-shaped leaves, and an upright undivided stalk; commonly called the Brumpton Stock Gilliflower.

8. CHEIRANTHUS *foliis lanceolatis, integerrimis, obtusis, incanis, ramis floriferis axillaribus, caule suffruticoso*. Cheiranthus with hoary, entire, spear-shaped, obtuse leaves, flower branches proceeding from the sides, and a shrubby stalk. The Purple, or Violet Stock Gilliflower.

9. CHEIRANTHUS *foliis lanceolatis, acutis, petiolatis, viridibus, caule suffruticoso*. Cheiranthus with spear-shaped acute leaves, which are green, and have foot-stalks, and a shrubby stalk; commonly called white Wall-flower.

10. CHEIRANTHUS *foliis conferto-capitatis, recurvatis, undatis*. *Lin. Sp. Pl. App.* 1198. Cheiranthus with leaves growing close together in heads, which are turned backward, and are waved.

11. CHEIRANTHUS *foliis linearibus, obtusis, incanis, integerrimis, siliquis acuminatis, caule suffruticoso*. Cheiranthus with narrow obtuse leaves, which are hoary, and very entire sharp pointed pods, and a shrubby stalk; or, Narrow-leaved Sea Stock Gilliflower.

12. CHEIRANTHUS *caule diffuso, foliis lanceolatis, sessilibus, floribus alternis*. Cheiranthus with a diffused stalk, spear-shaped leaves fitting close to the stalks, and flowers placed alternate; commonly called Dwarf, or *Virginia* Stock Gilliflower.

13. CHEIRANTHUS *foliis lanceolatis, subdentatis, retusis; siliquis apice subulatis*. *Hort. Upsal.* 187. Cheiranthus with spear-shaped leaves indented at bottom, and pods with awl shaped points.

14. CHEIRANTHUS *siliquarum apicibus tridentatis*. *Hort. Cliff.* 335. Cheiranthus with pods indented in three parts at the point.

The first sort grows naturally in the south of *France*, in *Spain*, and *Italy*; this is an annual plant, which rises a foot high, with an angular channelled stalk, which branches upward, garnished with long, narrow, green leaves, resembling those of the common Wall-flower, but are sharply sawed on their edges, fitting close to the stalks; at the extremity of the branches the flowers are produced in loose spikes; these are yellow, having four petals situated in the form of a cross, greatly resembling those of the common yellow Wall-flower, but have no scent, and are succeeded by long four-cornered pods filled with brown seeds.

The second sort grows naturally in *Hungary* and *Istria*; this is also an annual plant, rising with an upright stalk, nearly the same height as the other, but doth not branch out as that doth. The leaves are broader, smoother, and not sawed as those of the other. The flowers come out in loose spikes at the top of the stalks; these are small, and of a pale yellow without scent, and are succeeded by four-cornered pods like those of the former.

The third sort grows naturally upon old walls and buildings, in many parts of *England*, but is also cultivated in gardens for the fragrancy of its flowers. When these plants grow upon walls, or buildings, they seldom rise more than six or eight inches high, having very tough roots, and firm stalks; the leaves are short, and sharp pointed, and the flowers are small, but in gardens the plants will grow two feet high, and branch out wide on every side; the leaves are broader, and the flowers much larger, but, in severe winters, when these plants are frequently killed in the gardens, those upon walls will receive no injury, though they are much more exposed to the winds and frosts; for as these plants are stunted, and of a firmer texture, having but little juice, so the cold never affects them.

There is a variety of this with very double flowers, which is propagated in the gardens from slips, planted in the spring, which readily take root. There is one sort of this with variegated leaves, which is preserved in the gardens, but this is not quite so hardy as the plain.

The large, yellow, and bloody Wall-flower, are also supposed to be varieties of this, which have been improved by culture; and this I am inclinable to believe, because I have frequently observed many of them degenerate to the common sort; but although I have many years sowed the seeds of the common sort from the walls, yet I could never find them alter, except in being larger, but not any of them approached toward the other varieties. The large bloody Wall-flower will frequently rise with double flowers from seeds, if they are carefully saved from such plants as have five petals; and these double flowers may be propagated by slips, as the common sort, but the plants so raised will not produce such large spikes of flowers as those which are propagated by seeds.

There:

There is also another variety with double blood coloured flowers, whose petals are shorter and more numerous, approaching nearer to the common double Wall flower, but much larger. This is called the Old Bloody Wall-flower. It is propagated from slips in the same manner as the other double sorts.

The fourth sort grows naturally upon the *Alps*, and the mountains in *Italy*, where it rarely rises above six inches high; the leaves are very narrow, and the flowers grow in close spikes, at the end of the branches; they are of a pale yellow, or brimstone colour, and the necks of the petals are much longer than the empalement; they have but little scent. It was titled the Straw-coloured Wall-flower by the gardeners.

The sorts with single flowers produce seeds in plenty, from which the plants are raised, but the largest and deepest coloured flowers should always be selected for seeds, because from seeds carefully saved, there will be fewer of the plants degenerate. The seeds should be sown upon poor, or undunged soil, and when the plants are fit to remove, they should be transplanted into nursery beds, at about six inches distance each way. In the autumn they may be transplanted into the borders of the flower garden, where they are designed to remain, that the plants may get good roots before the frost comes on. This is the method which is commonly practised with these flowers; but if the seeds are sown upon poor land, where they are designed to remain, and not transplanted, they will thrive, and endure the frost in winter, much better than those which are removed; so that upon ruins or rubbish the seeds of these plants may be sown, where they will thrive and continue much longer than in good land; and in such places, if they are properly disposed, they will be very ornamental, and their flowers having a strong odour, will perfume the air to a considerable distance.

The fifth sort is now generally known by the appellation of Ten Weeks Stock, but it is what was formerly titled Annual Stock Gilliflower, which of late has been applied to another species, which is biennial. This rises with a round smooth stalk, about a foot high, dividing into several branches upward, garnished with spear-shaped hoary leaves, which are rounded at their ends, and placed without order, of unequal sizes; at the end of the branches the flowers are produced in loose spikes, which are placed alternate; the empalement of the flower is large, erect, and slightly cut into several acute parts at the top; the petals are large and heart-shaped, spreading open in form of a cross; the pods are long, cylindrical, and have a longitudinal furrow on one side, which opens into two cells, which are filled with flat roundish seeds, having a thin border.

Of this sort there are the red, the purple, the white, and striped, with single flowers, and the same colours with double flowers; these are very great ornaments in the borders of the flower garden, in the autumn, when there is a scarcity of other flowers; and if the seeds are sown at two or three different times, the flowers may be continued in succession near three months.

The first sowing should be about the middle of *February*, upon a very slender hot-bed, just to bring up the plants, which must be guarded against frost, and when they are fit to remove, they should be transplanted into nursery beds, at about three or four inches distance. In these beds they may remain six or seven weeks to get strength, and may then be planted into the borders of the flower garden, where they are to remain: if these are transplanted when there is rain, they will soon take root, after which they will require no farther care. From these early plants good seeds may be expected, therefore some of the finest plants of each colour should be preserved, and marked for seeds, which, when

ripe, should be carefully cut before the frost pinches it, and the stalks tied up in small bundles, and hung up in a dry room, till the pods are well dried, when the seeds may be rubbed out, and preserved for use.

The sixth sort is a biennial plant, though when the seeds are sown early in the spring, the plants often flower the following autumn; but these plants which are so forward, are often killed in winter; therefore it is much better to sow them in *May*, that the plants may not grow too rank the first season, so will live through the winter, and these will produce large spikes of flowers the second year.

This is commonly called the Queen's Stock Gilliflower, by the gardeners, and differs greatly from the other sorts by its branching stalk.

It rises with a strong stalk, which is almost shrubby, a foot high or more, having oblong, spear-shaped, hoary leaves, which are frequently waved on their edges; from the stalk is sent out many lateral branches, which are garnished with the same shaped leaves, but are smaller; these side branches are each terminated by a loose spike of flowers, each having an oblong woolly empalement, and consist of four large roundish petals, which are indented at the end. When these plants grow in dry rubbish, they will last two or three years, and become shrubby; but those with single flowers, are not worth preserving after they have perfected their seeds.

The flowers of this sort vary in their colour, some are of a pale red, others are of a bright red, and some are curiously variegated, but those of the bright red are generally most esteemed. There are always a great number of double flowers produced, if the seeds are well chosen, frequently three parts in four of the plants will be double; and as the plants divide into many branches, so they make a fine appearance during their continuance in flower.

The seventh sort is known by the title of *Brumpton* Stock Gilliflower, I suppose from its having been there first cultivated in *England*. This rises with an upright, strong, undivided stalk, to the height of two feet or more, garnished with long hoary leaves, which are reflexed, and waved on their edges; and at the top form a large head, out of the center of which arise the flower stalk; when the plant is strong, it is frequently a foot and an half long, putting out two or three short branches toward the bottom; the flowers of this kind have longer petals than any of the other sorts, and are formed into a pyramidal spike, but those with single flowers are loosely disposed, because the flowers having but few petals, do not fill the spike, as those do which are double; for these often have so many petals, as to render each flower as large and full as small *Roses*; and when they are of a bright red, make a noble appearance, being excelled by none of the flowery tribe; but the plants of this sort produce but one spike, in which it differs from all the other kinds, and being constant in this particular, I think is sufficient to establish a distinct species. This sort is generally biennial, though many times the plants are preserved longer, but they are always stronger the first year of their flowering, than they will be after; so that the seeds are sown every spring, to continue a succession of flowering plants.

The eighth sort is the white Stock Gilliflower, which is of longer duration than either of the other sorts; I have frequently had these plants live three or four years, which have become shrubby; their stalks have been three feet high, and branched out on every side, so as to appear like shrubs; these seldom send out flower-stalks from the center of the plant, but it is the side branches which produce the flowers, and these side branches divide into several other, which is not common to the other sorts. There are always many double flowers rise from seeds of this sort, when they are well chosen; some years I have scarce had enough single flowers to preserve their kind.

The ninth sort is known by the title of white Wall-flower, among the gardeners and florists. This rises with a greenish stalk a foot or little more high, dividing into many branches, garnished with narrow, smooth, spear-shaped leaves, of a lucid green, of thicker consistence than those of any of the other sorts, and come out without any order; they are near three inches long, and about half an inch broad in the middle; the flowers are produced in loose spikes at the end of the branches, which are of a pure white, and have a great fragancy, especially in an evening, or in cloudy weather; the flowers are succeeded by oblong compressed pods, like those of the other species. There is a variety of this with double flowers, which is propagated by cuttings or slips, in the same manner as the double Wall-flowers; but these plants require protection from great rains, and frost in winter; so if they are planted in pots, and placed under a common frame in winter, where in mild weather they may enjoy the open free air, and covered from hard rains and frost, they may be preserved several years.

Sometimes many of the double flowers will come up from seeds, but not so frequent as some of the other sorts. I have frequently raised more than one hundred plants in a season, without obtaining one double flower, and from the seeds of these, have the following year had more than half the plants with double flowers: but this is not to be expected often.

The seeds of the tenth sort were sent me by Dr. *Linnaeus*, from *Upsal* in *Sweden*. This plant rises about nine inches high, with an herbaceous swelling stalk; the leaves are produced in clusters at the top, which are very hoary, waved on their edges, have obtuse points, and set very close to the stalk; the flowers are produced in slender spikes, from the side of the stalk; these are purple, but not so fragrant as many of the other sorts; the pods are woolly, and recurve backward at the end. This is an accidental variety, which has sprung up with me from seeds of the Queen's Stock Gilliflower.

All these sorts flower in *May* and *June*, at which time they are the greatest ornament to the flower garden, therefore deserve our care to cultivate them as much as any of the flowery tribe; but in order to have many double flowers, there must be great care taken in the choice of plants for seeds, without which there can be little hopes of having these flowers in perfection. The only sure way of getting many double flowers, is to make choice of those single flowers which grow near many double ones; for I have always found those seeds which have been saved from plants growing in beds close to each other, where there happened to be many double flowers among them, have produced a much greater number of plants with double flowers, than those which have been saved from plants of the same kinds, which grew single in the borders of the flower garden; so that there should be a small bed of each kind planted on purpose to save seeds in the flower nursery; or if they are sown there, and the plants thinned properly when they are young, they need not be transplanted; for I have always observed the plants which have come up from scattered seeds, that have not been transplanted, endure the frost much better than those which have been removed; for as these plants send out horizontal roots, which spread near the surface of the ground, so when they are transplanted, the roots are forced downward, out of their natural direction; and if their stalks were grown tall before removal, they are generally planted low in the ground, whereby they are apt to rot, if the ground is moist, or the winter should prove wet; therefore where they can be left unremoved, there will be a better chance of their living through the winter; and as these beds need not be of great extent, so when the winter proves very severe, it will not be much trouble or expence to arch the beds over with hoops, and cover them with mats in frosty weather, by which method they may be always preserved.

The time for sowing of the seeds before mentioned, must be understood to be for the sorts which are biennial; for the annual, or Ten Weeks Stock Gilliflower, should be for the first season, sown in *February*, as was before directed; and to succeed these, there should be another parcel sown in *March*; and those who are curious to continue these flowers late in the autumn, should sow a parcel of the seed the latter end of *May*; and if these last sown plants are upon a warm border, where they may be covered, by placing glasses before them in winter, or covering them with mats, they may be continued in flower till *Christmas*; and if some of the plants are potted, and put under a hot-bed frame in autumn, where they may enjoy the open air in mild weather, and screened from hard rains and frost, these plants may be kept flowering all the winter, when the winters are not very severe.

There are some who propagate the double Stock Gilliflower by slips and cuttings, which will take root when properly managed; but the plants so raised are never so strong as those which come from seeds, and their spikes of flowers are always very short, so have not half the beauty; therefore it is not worth while to practise this method, unless for those sorts which cannot be obtained with any certainty from seed.

The eleventh sort grows naturally in the south of *France*, in *Spain* and *Italy*, near the sea coast. This rises near a foot high, with a ligneous stalk, dividing into many small branches, garnished with narrow hoary leaves, which are entire, and rounded at their extremity; the flowers are produced in loose spikes at the end of the branches, which are smaller than either sort before mentioned, of a bright red at their first appearing, but fade to a purple before they fall off. The stalks, leaves, and the whole plant is very white, and by its woody stalks hath the appearance of a perennial plant, but it constantly perishes in autumn. The seeds of this sort should be sown in autumn, upon a warm border, where the plants are designed to remain; when the plants come up, they will require no farther care but to keep them clean from weeds, and thin them where they come up too close. These autumnal plants will flower early in *June*, so will produce good seeds; but those which are sown in the spring will flower in *July* and *August*, so that from these there cannot be any certainty of having ripe seeds; however, by sowing the seeds at two or three different seasons, there may be a succession of flowers continued for three or four months.

The twelfth sort is commonly sown in gardens, sometimes as an edging for borders, but more generally in patches between taller growing flowers: it is titled sometimes Dwarf Annual Stock Gilliflower, and by others it hath the appellation of *Virginia* Stock Gilliflower. This seldom rises more than six inches high, sending out many branches from the root, which spread near the ground, and grow irregular; these are garnished with spear-shaped leaves, rounded at their ends, and sit close to the branches at their base; the flowers come out in loose spikes at the end of the branches, which are of a purple colour, composed of four petals in form of a cross, and are succeeded by slender pods, like those of the other sorts.

The thirteenth sort rises near two feet high, sending out many upright branches from the bottom, which are thinly garnished with spear-shaped leaves, the lower ones being a little indented; the flowers come out single, at great distances from each other, toward the upper part of the branches; these are small, of a purplish red colour, and soon fall away, being succeeded by long taper pods, with awl-shaped points. This is an annual plant, which may be treated in the same manner as the last mentioned sort; but as it hath little beauty, it is not often cultivated in gardens.

The fourteenth sort grows naturally on the sea coasts in *Italy, Spain and Portugal*. This is also an annual plant, which branches out from the root, into many declining stalks; the lower leaves are about two inches long, and three quarters of an inch broad, very deeply sinuated on their edges, and hoary, those upon the stalks are of the same form, but much smaller; the flowers are produced from the side of the stalks singly, and at the top in loose spikes; the empalements of the flowers are covered with a white down, as are also the ends of the branches; the flowers are purple, composed of four leaves placed in form of a cross; the pods are about three inches long, taper, woolly, and at their ends are divided into three parts, which spread into a triangle. If the seeds are sown in autumn, on a warm border, the plants will live through the winter, and these will flower early in *June*, so from these good seeds may be obtained.

CHELIDONIUM. *Tourn. Inst. R. H. 231. tab. 116. Celandine and Horned Poppy.*

The Characters are,

The flower hath four large roundish petals; in the center is situated a cylindrical germen, attended by a great number of stamina. The germen afterward becomes a cylindrical pod, with one or two cells, opening with two valves, and filled with many small seeds.

The Species are,

1. CHELIDONIUM *pedunculis umbellatis. Lin. Gen. Plant. 505.* Celandine with an umbellated foot-stalk; or the common Celandine.

2. CHELIDONIUM *foliis quinque lobatis, lobis angustis acutè laciniatis.* Celandine whose leaves are composed of five narrow lobes, which are cut into many acute segments.

3. CHELIDONIUM *pedunculis unifloris, foliis amplexicaulibus sinuatis, caule glabro. Lin. Sp. Plant. 506.* Celandine with single flowers on the foot-stalks, sinuated leaves which embrace the stalks, and a smooth stalk; or, Yellow horned Poppy.

4. CHELIDONIUM *pedunculis unifloris, foliis sessilibus pinnatifidis, caule hispido. Lin. Sp. Plant. 506.* Celandine with single flowers upon the foot-stalks, leaves set close to the stalks which have winged points, and a rough stalk. Hairy Glaucium, or horned Poppy, with a scarlet flower.

5. CHELIDONIUM *pedunculis unifloris, foliis semiamplexicaulibus, dentatis, glabris.* Celandine with foot-stalks having a single flower, and smooth indented leaves, which half embrace the stalks. Smooth horned Poppy with a scarlet flower.

6. CHELIDONIUM *pedunculis unifloris, foliis pinnatifidis, linearibus, caule lævi. Lin. Sp. Plant. 506.* Celandine with single flowers upon the foot-stalk, many pointed narrow leaves, and a smooth stalk. Horned Poppy with a Violet-coloured flower.

The first sort is the common Celandine which is used in medicine, and is esteemed aperitive and cleansing, opening obstructions of the spleen and liver; and is of great use in curing the jaundice and scurvy. This grows naturally on the side of banks, and in shady lanes in many parts of *England*, so is seldom cultivated in gardens; for if the seeds are permitted to scatter, the ground will be plentifully stored with plants to a considerable distance. It flowers in *May*, at which time the herb is in the greatest perfection for use.

The second sort is found growing in a few particular places, where the seeds have been formerly sown, or the plants cast out of gardens. This is by some supposed to be only a variety of the first, but I have propagated this by seeds above thirty years, and have constantly found the plants the same, without variation. The leaves of this are divided into narrow long divisions, which are deeply jagged on their edges in acute segments, and the petals of the flower are cut into many parts, in which it differs from the

first. If the seeds of this sort are permitted to scatter, they will fill the ground with plants. They both delight in shade.

The third sort is known by the title of Horned Poppy; it was so called from the resemblance which the flower bears to the Poppy, and the long seed vessels which is like a horn. It grows naturally upon the sandy and gravelly shores by the sea, in many parts of *England*, from whence the seeds have been brought into gardens, where it is sometimes allowed to have place for the sake of variety. This plant abounds with a yellow juice which flows out from every part, when broken. It sends out many thick gray leaves, which are deeply jagged; the stalks are strong, smooth, and jointed, which rise near two feet high, and divide into many branches. These are garnished with leaves at each joint; those on the lower part of the stalks are long, broad, and deeply jagged, but the upper leaves are entire and almost heart-shaped: they closely embrace the stalks with their base, from the bosom of the leaves come out the short foot-stalks of the flowers, each supporting one large yellow flower, composed of four broad petals, which spread open like the Garden Poppy, in the center of which are a great number of yellow stamina, surrounding a long cylindrical germen, crowned by a narrow pointed stigma, which is permanent, remaining upon the top of the horned seed vessel, which grows nine or ten inches long, having a longitudinal furrow on one side, where it opens when ripe, and lets out the seeds. This is a biennial plant, which flowers the second year, and perishes soon after the seeds are ripe.

If the seeds of this plant are permitted to scatter, they will fill the ground near them with plants, so that it is not a proper plant for a flower garden; but if a few of the seeds are scattered about in rock work, the plants will rise without trouble, and in such places will have a pretty effect.

The fourth sort grows naturally in *Spain, Italy*, and some parts of *Germany*. The leaves of it are deeply jagged and hairy, of a pale green, growing close to the stalks: those at the bottom lie on the ground, and are broader than those above. The stalks are a foot and an half high, having a single jagged leaf placed at each joint; these have many divisions, from their origin to the point, which is extended longer than the lower leaves. The flowers come out from the bosom of the leaves; these are composed of five broad obtuse petals, which are of a dark scarlet colour, and soon fall off. In the center of each is situated an oblong germen, having no style, but supports a bifid stigma; this is attended by a great number of short stamina, terminated by obtuse summits. The germen afterward becomes a long taper pod, on the apex of which the bifid stigma remains, sitting on the middle partition, which divides the pod into two cells, which are filled with small seeds. It flowers in *June* and *July*, and the seeds ripen in autumn. As the flowers of this plant are of but short duration, so they do not make any considerable figure; but the foliage of the plant is very elegant, and might be introduced by way of ornament to furniture to great advantage, being very picturesque; it may also be wrought into patterns for silks, and painted upon porcelaine, where it would have a very good effect. If the seeds of this plant are sown in the autumn, they will more certainly grow, than those which are sown in the spring, which frequently in dry seasons do not come up the same year, or at least not before autumn; whereas those sown in autumn come up in the spring, and these plants come early to flower, so that good seeds may always be obtained from them. They should be sown where the plants are to remain, and will require no other care but to thin them where they are too close, and keep them clean from weeds.

The fifth sort differs from the fourth, in having broader leaves, which are not so deeply divided; the whole plant

is smooth, and the flowers are larger, but are of the same colour: this is also an annual plant, and requires the same treatment as the last.

The sixth sort grows naturally among the corn, in some parts of *England*. This is also an annual plant, whose seeds should be sown in autumn, for those which are sown in the spring seldom succeed. The leaves of this sort are finely jagged, and divided into narrow segments, somewhat like those of Buckhorn Plantain; they are smooth, of a lucid green, and are commonly opposite. The stalks rise little more than a foot high, dividing into two or three branches upward, which are garnished with small leaves of the same form as those below. The flowers are sustained by slender foot-stalks, which come out from the wings of the leaves; these are composed of four obtuse petals, of a Violet colour, in the center of which is situated a cylindrical germen, attended by a great number of stamina; the germen afterward becomes a long cylindrical pod, like those of the other species. The flowers of this plant are very fugacious, seldom lasting above three or four hours before the petals drop off, especially in clear weather. If the seeds are permitted to scatter, the plants will come up without care as the others.

CHELONE. *Tourn. Art. R. S.* 1706. *tab.* 7. *fol.* 2.

The Characters are,

The flower is of the ringent kind, having a short cylindrical tube, which is swollen at the chaps, where it is oblong, convex above, and plain below; the mouth is almost closed. It hath four stamina, the two side ones being a little longer than the other. It hath an oval germen, which afterward becomes an oval capsule having two cells, which are filled with flat roundish seeds having a border.

The Species are,

1. CHELONE *foliis lanceolatis, acuminatis, sessilibus obsolete serratis, radice reptatrice*. Chelone with pointed, spear-shaped leaves, set close to the stalks, with small serratures on their edges, and a creeping root; or, Chelone of *Acadia*, with a white flower.

2. CHELONE *foliis lanceolatis, obliquis, petiolatis, oppositis, marginibus acutè serratis*. Chelone with oblique, spear-shaped leaves, growing opposite on foot-stalks, and their borders sharply sawed. Chelone with a purple flower.

3. CHELONE *caule foliisque hirsutis*. *Lin. Sp. Plant.* 611. Chelone with hairy stalks and leaves.

The first sort grows naturally in most parts of *North America*. This is called by *Joscelin*, in his *New England Rarities*, the Humming Bird tree. It hath a pretty thick jointed root, which creeps under ground to a considerable distance, sending up smooth channelled stalks, which rise about three or four feet high, garnished with two leaves at each joint, standing opposite without foot-stalks; they have small serratures on their edges, which scarcely appear. The flowers grow in a close spike at the end of the stalks, they are white, and have but one petal, which is tubular, and narrow at the bottom, but swells upward, almost like the Foxglove flower; the upper side is bent over and convex, but the under is flat, and slightly indented in three parts at the end. It flowers in *August*, and when the autumn proves favourable, the seeds will ripen in *England*; but as the plants propagate so fast by their creeping roots, the seeds are seldom regarded. The best time to transplant the roots is in autumn, that they may be well established in the ground before the spring, otherwise they will not flower so strong, especially if the season proves dry. They will thrive in almost any soil or situation, but their roots are apt to creep too far, if they are not confined, and then their stalks stand so far distant from each other, as to make but little appearance; therefore they should be planted in pots, which will confine their roots, so that in each pot there will be eight

or ten stalks growing near each other, when they will make a tolerable good appearance. This plant is very hardy, so is not injured by cold, but it must have plenty of water in hot weather.

The second sort grows naturally in *Virginia*. The roots of this do not creep so far as those of the first, the stalks are stronger, and the leaves much broader, and are oblique; they are deeply sawed on their edges, and stand upon short foot-stalks: the flowers are of a bright purple colour, so make a finer appearance. This flowers at the same time with the first, and is propagated by parting of the roots in the same manner.

The third sort I received from *New England*, where it grows naturally: this is near to the first sort, but the stalks and leaves are very hairy, and the flower is of a pure white. It flowers at the same time with the former, and requires the same treatment.

As these plants flower in the autumn, when there is a scarcity of other flowers, so it renders them more valuable, especially the second sort, whose flowers make a very pretty appearance when they are strong; and if some of them have a shady situation in the summer, they will flower later in the autumn.

CHENOPODIA-MORUS. See Blitum.

CHENOPODIUM. *Tourn. Inst. R. H.* 506. *tab.* 288. Goose-foot, or Wild Orach.

The Characters are,

The flower hath no petal, but in the center it hath five stamina placed opposite to the leaves of the empalement. It hath a round germen, which afterward becomes a five-cornered fruit inclosed in the empalement, containing one roundish depressed seed.

The Species are,

1. CHENOPODIUM *foliis triangulari-sagittatis, integerrimis*. *Hort. Cliff.* 84. Goose-foot, with arrow-shaped triangular leaves which are entire; called *English Mercury*, All Good, or Good Henry.

2. CHENOPODIUM *foliis integerrimis rhombeo-ovatis, floribus conglomeratis*. *Flor. Suec.* 216. Goose-foot with entire oval rhomboidal leaves, and flowers growing in clusters. Stinking Orach.

3. CHENOPODIUM *foliis lineari-lanceolatis, planis, integerrimis*. *Hort. Cliff.* 86. Goose-foot with narrow spear-shaped leaves, which are plain and entire; commonly called *Belvedere*, or Summer Cypress.

4. CHENOPODIUM *foliis oblongis, sinuatis, racemis nudis multifidis*. *Hort. Cliff.* 84. Goose-foot with oblong sinuated leaves, and naked multifid spikes of flowers; commonly called *Oak of Jerusalem*.

5. CHENOPODIUM *foliis lanceolatis, dentatis, racemis foliatis simplicibus*. *Hort. Cliff.* 84. Goose-foot with spear-shaped indented leaves, and single leafy spikes of flowers; commonly called *Oak of Cappadocia*.

6. CHENOPODIUM *foliis lanceolatis, dentatis, caule fruticoso*. Goose-foot with spear-shaped indented leaves, and a shrubby stalk; called *Shrubby Mexican Orach*.

7. CHENOPODIUM *foliis linearibus, teretibus, carnosis, caule fruticoso*. *Hort. Cliff.* 86. Goose-foot with narrow, taper, fleshy leaves, and a shrubby stalk; called *Stone Crop tree*, or *shrubby Glasswort*.

There are many other species of this genus, some of which grow naturally on dunghills, and the side of ditches, in most parts of *England*, where they often become very troublesome weeds; for which reason, I have not enumerated them here.

The first sort is found growing naturally in shady lanes in many parts of *England*, but it is very doubtful if the seeds have not been cast out of gardens originally, because this plant was formerly cultivated in kitchen gardens for use; and in some of the northern counties, the people still pre-

serve it in their gardens as an esculent herb; which in the spring season, they dress in the same manner as Spinage, for which it is a substitute. But, as the latter is a much better herb, so it has obtained the preference very justly, in all the countries where the culture of the kitchen garden is understood and practised.

The second sort is very common upon dunghills and in gardens, in most parts of *England*: it is seldom cultivated, except in some physick gardens; for the markets in *London* are supplied with it by the herbwomen, who gather it in the places where it grows wild.

The third sort is sometimes cultivated in gardens; it is a beautiful plant, which is naturally disposed to grow very close and thick, and in as regular a pyramid as if cut by art. The leaves are of a pleasant green; and were it not for that, it hath so much of the appearance of a Cypress tree, that at some distance it might be taken for the same, by good judges: the seeds should be sown in autumn, and in the spring, when the plants are come up, they may be planted into pots of good earth, and kept supplied with water in dry weather: these pots may be intermixed with other plants to adorn court yards, &c. where they will appear handsome, until their seeds begin to swell and grow heavy, which weigh down and displace the branches; at which time the pots should be removed to some abject part of the garden, to perfect their seeds; which, if permitted to fall upon the ground, will come up the next spring; so that you need be at no more trouble in propagating these plants, but only to transplant them where you intend they should grow.

The fifth sort was formerly used in medicine; but although it still continues in the catalogue of simples annexed to the *London Dispensatory*, yet is very seldom used at present. This plant may be propagated by sowing the seeds in an open border of good earth in the spring, where it will perfect its seeds in autumn; which, if permitted to shed upon the ground, will arise as the former.

The fourth sort was brought from *America*, where the seeds are called worm seed; I suppose from some quality contained in it, which destroys worms in the body.

This is propagated by sowing the seeds in the spring, as the before-mentioned sorts, and will perfect its seed in autumn; after which, the plant decays to the ground: but if the root be preserved in shelter under a common frame in winter, the stalks will rise again the following spring.

The leaves of this plant emit a very strong odour when bruised, somewhat like those of the Ambrosia, for which the plants are preserved in gardens, for the flower hath no beauty. This plant grows naturally in most parts of *North America*, where it is generally much used to destroy worms in children. It sends up several stalks from the root, which rise about two feet high, garnished with oblong leaves a little indented on their edges, of a light green, and placed alternately on the stalks; the flowers come out from the wings of the leaves, on the upper part of the branches, in loose spikes: these appear in *July*, and the seeds ripen in *September*; which, if permitted to scatter, the plants will come up in plenty the following spring.

The seeds of all the species of this genus will succeed best, if they are sown in autumn; for when they are sown in the spring, they frequently lie a whole year before the plants come up: therefore where the seeds of any of them scatter, the plants will come up much better than those which are sown by hand.

The fifth sort is annual: this also grows naturally in *North America*, from whence I have frequently received the seeds. It is also a native of many of the warm countries in *Europe*. It hath many oblong leaves at the bottom, which are deeply sinuated on both sides, somewhat like those of the

Oak tree, from whence it received the title of Oak of *Jerusalem*. These are purple on their under side, and when bruised, emit a strong odour. The stalks rise about eight or nine inches high, dividing into several smaller branches. The lower part of these is garnished with leaves of the same shape with those below, but are smaller. The flowers grow in naked loose spikes, divided into many parts: they are small, herbaceous, and are succeeded by small round seeds. This sort flowers in *June* and *July*, and the seeds ripen in autumn.

The sixth sort hath leaves very like those of the fourth, and have the same scent; but it hath a shrubby stalk, which rises five or six feet high, and divides into many branches. It is a native of *America*, and must be housed in the winter, for it will not live through the winter in *England* in the open air. It is easily propagated by cuttings during any of the summer months, which, if planted in a shady border and duly watered, will soon take root; and then may be planted in pots, and placed in the shade till they have taken new root, after which they may be placed with other hardy exotick plants in a sheltered situation during summer; and when the frosts come on, they must be removed into the green-house, but they only require protection from hard frosts, so should have plenty of air in mild weather.

The seventh sort grows naturally on the sea coast in *Devonshire* and *Cornwall*, but is propagated in the nurseries for sale. This sends out from the root many slender shrubby stalks, which rise five or six feet high, and divide upward into smaller ligneous branches, which grow erect, and are closely garnished with small taper succulent leaves, like those of the lesser Houseleek; these remain all the year, for which the shrub is chiefly valued. The flowers are small, and have no beauty. This is propagated by suckers, which it sends out from the roots in plenty. It may be transplanted either in spring or autumn, and will thrive almost any where.

CHERRY-LAUREL. See *Padus*.

CHERRY-TREE. See *Cerasus*.

CHERVIL. See *Chærefolium*.

CHESTNUT. See *Castanea*.

CHESTNUT, the Horse. See *Esculus*.

CHIONANTHUS. *Lin. Gen. Plant.* 21. The Fringe or Snowdrop tree.

The Characters are,

The flower is of one petal, divided into four very long narrow segments, which are erect. It hath two short stamina inserted in the tube of the petal. In the center is placed the oval germen, which afterward becomes a round berry, with one cell inclosing one hard seed.

We have but one Species of this plant in the *English* gardens at present, viz.

CHIONANTHUS *pedunculis trifidis trifloris*. *Lin. Sp. Pl.* 3. Snowdrop tree, or Fringe tree, with trifid foot-stalks supporting three flowers.

This shrub is common in *South Carolina*, where it grows by the side of rivulets, and seldom is more than ten feet high: the leaves are as large as those of the Laurel, but are of a much thinner substance; the flowers come out in *May*, hanging in long bunches, and are of a pure white, from whence the inhabitants call it Snowdrop tree; and, from the flowers being cut into narrow segments, they give it the name of Fringe tree: after the flowers have fallen away, the fruit appears, which becomes a black berry, about the size of Sloes, having one hard seed in each.

This tree is now more common in the curious gardens in *England*, than it was a few years since; there having been many young plants raised from the seeds, which have been brought from *America* lately: there have also been some plants

plants propagated by layers, though there is great uncertainty of their taking root, which they seldom do in less than two years: nor will they ever take root, unless they are well supplied with water in dry weather.

The best way to obtain good plants, is from the seeds, which must be procured from *America*, for they never have produced any fruit in this country: the seeds should be sown in small pots filled with fresh loamy earth soon after they arrive, and should be placed under a hot bed frame, where they may remain till the beginning of *May*, when they must be removed to a situation exposed to the morning sun, and screened from the sun in the middle of the day; for as these seeds lie in the ground a whole year before the plants will come up, so they should not be exposed to the sun the first summer, but the following autumn they should be removed, and placed under a frame, to protect the seeds from being injured by the frost. And if the pots are plunged into a moderate hot-bed the beginning of *March*, it will bring up the plants much sooner than they will otherwise rise; by which means they will get more strength the first summer, and be better able to resist the cold of the next winter: while these plants are very young, they will be in danger of suffering by severe frost; but, when they have obtained strength, they will resist the greatest cold of our climate in the open air; therefore for the two or three first winters, it will be proper to keep them under shelter. In the spring, before they begin to shoot, they should be shaken out of the pots, and carefully separated so as not to break off their roots, and each planted in a small pot, filled with light loamy soil, and plunged into a very moderate hot-bed, just to forward the taking fresh root; then they should be gradually inured to the open air, and during the following summer, the pots should be plunged into the ground, to prevent the earth from drying, in a situation where they may enjoy the morning sun, but screened from the great heat at noon. The autumn following, they should be again placed under a hot-bed frame to screen them from frost, but they should enjoy the free air at all times, when the weather is mild. The *April* following, the plants may be shaken out of the pots, with the ball of earth to their roots, and planted where they are designed to remain.

This shrub delights in a moist, soft, loamy soil, and if it is planted in a sheltered situation, will endure the cold of our winters very well in the open air; but in dry land, it is very subject to decay in warm seasons.

In the places where this shrub grows naturally, it produces great quantities of flowers, so that they seem covered with snow, which gave occasion to the inhabitants for titling it Snowdrop tree; but in *England* it flowers but sparingly, and the bunches of flowers are generally produced very thinly, so that they make but little appearance.

CHIRONIA. *Lin. Gen. Plant.* 227.

The Characters are,

The flower hath one petal, with a roundish tube the size of the empalement, which is divided into five equal parts above: it hath five short broad stamina, which are fastened to the top of the tube. It hath an oval germen, situated in the center, which after-ward becomes an oval capsule with two cells, filled with small seeds.

The Species are,

1. CHIRONIA frutescens, capsulifera. *Lin. Sp. Plant.* 190. Shrubby Chironia bearing capsules.

2. CHIRONIA frutescens baccifera. *Lin. Sp. Plant.* 190. Shrubby berry-bearing Chironia.

These plants grow naturally at the *Cape of Good Hope*.

The first sort has a fibrous root, which spreads near the surface of the ground. The stalks are round, and inclining to be ligneous, but are of a very soft texture; these grow from two to three feet high, sending out several branches which grow erect; these are garnished with succulent leaves,

which are an inch or more in length, and an eighth part of an inch broad, ending in an obtuse point. At the ends of each shoot the flowers are produced, which are tubulous, and spread open at the top like those of Periwinkle; these are of a bright red colour, and when there are a large number of the flowers open on the same plant, they make a very fine appearance. In the center of the flower is placed an oval germen, upon which there is fixed a recurved style, terminated by a blunt stigma; this is surrounded by five incurved stamina, each supporting a large summit. When the flowers fall away, the germen becomes an inflated capsule, which is filled with small seeds. The flowers are produced from *June* to autumn, and the seeds ripen in *October*. This plant should be placed in an airy glass case in winter, where it may enjoy a dry air and much sun, but will not thrive in a warm stove, nor can it be well preserved in a common green-house, because a damp moist air will soon cause it to rot.

The seeds of this plant should be sown in small pots filled with light sandy earth, and plunged into a moderate hot-bed; sometimes the seeds will lie a long time in the ground, so that if the plants do not appear the same season, the pots should not be disturbed, but preserved in shelter till the following spring, and then plunged into a fresh hot-bed, which will bring up the plants in a short time if the seeds are good. When the plants are fit to remove, they should be transplanted into small halfpenny pots, four or five in each pot, then plunge the pots into a moderate hot-bed, where they must have a large share of air in warm weather, to prevent their drawing up weak; when the plants have obtained some strength, they must be gradually inured to bear the open air; but when they are exposed abroad, if there should happen much rain, the plants must be screened from it, otherwise it will cause them to rot; they must be placed in a warm sheltered situation in summer, and mixed with such other plants as require but little water; where they may remain till autumn, when they must be placed in a dry airy glass case, and in the winter should have very little wet, but must enjoy the sun as much as possible, and in mild weather should have fresh air admitted to them, but must be protected from frost; with this management, the plants will thrive and produce flowers the second year from seed; the cuttings of this sort will take root, if properly managed.

The second sort rises with a firmer stalk than the first, which is round, jointed, and divides upward into a greater number of branches, which are garnished with short, narrow, pretty thick succulent leaves. The flowers are produced at the end of the branches, in the same manner as the first, which are of a fine red colour, but not half so large as those of the first; when these fall away, they are succeeded by oval pulpy berries, in which are included many small seeds. This sort continues flowering great part of summer and autumn, and in warm seasons the seeds will ripen in *England*.

It is propagated by seeds in the same manner as the former sort, and the plants require the same treatment.

CHONDRILLA. *Lin. Gen. Pl.* 815. Gum Succory.

The Characters are,

The flower is composed of many hermaphrodite florets, which are uniform, included in a cylindrical scaly empalement; these have one petal, which is stretched out on one side like a tongue; they have each five short hairy stamina. The germen is situated under the floret, which after-ward becomes a single, oval, compressed seed, crowned with a single down, and inclosed in the empalement.

We have but one Species of this genus, viz.,

CHONDRILLA. *Lin. Hort. Cliff.* 383. Gum Succory.

This plant grows naturally in *Germany*, *Helvetia*, and *France*, on the borders of the fields, and is seldom preserved in gardens, because the roots are very apt to spread, and become troublesome weeds; and the seeds having down on

their tops, are carried by the wind to a great distance, so that the neighbouring ground is filled with the plants; the roots of this strike deep into the ground, and spread out with thick fibres on every side, each of which, when cut, or broken into many parts will shoot up a plant, so that when this plant hath obtained possession of the ground, it is very difficult to root out. The root sends out a great number of slender stalks, which at the bottom are garnished with oblong sinuated leaves, but those above are very narrow and entire. The flowers are produced from the side and top of the branches, which are like those of Lettuce, and are succeeded by seeds of the same form, crowned with down. It flowers in July, and the seeds ripen in September.

CHRISTMAS FLOWER, or Black Hellebore. See Helleborus.

CHRISTOPHORIANA. See Aſtea.

CHRISANTHEMOIDES OSTEOSPERMON. See Osteospermum.

CHRYSANTHEMUM. *Tourn. Inst. R. H. 491. tab. 280.* Corn Marigold.

The Characters are,

It hath a compound flower; the rays are composed of female florets, which are extended on one side like a tongue; these have an oval germen. The hermaphrodite flowers which compose the disk, are funnel-shaped, divided into five parts at the top; these have five short hairy stamina and an oval germen, which afterward becomes a single, oblong, naked seed.

The Species are,

1. CHRYSANTHEMUM *foliis amplexicaulibus, supernè laciniatis, infernè dentato-ferratis. Hort. Cliff. 416.* Corn Marigold with leaves embracing the stalks, the upper being jagged, and the lower indented like a saw.

2. CHRYSANTHEMUM *foliis amplexicaulibus, oblongis, supernè ferratis, infernè dentatis. Hort. Cliff. 416.* Corn Marigold with oblong leaves embracing the stalks, the upper ones being sawed, and the lower indented; or, Greater wild or Ox-eye Daisy.

3. CHRYSANTHEMUM *foliis lanceolatis, supernè ferratis, utrinque acuminatis. Hort. Cliff. 416.* Corn Marigold with spear-shaped leaves, those above being sawed, and pointed at both ends.

4. CHRYSANTHEMUM *foliis imis spatulato-lanceolatis, serratis, summis linearibus. Sawv. Monsp. 87.* Corn Marigold, with lower leaves pointed like a spear-shaped spatula, and sawed, and the upper ones linear.

5. CHRYSANTHEMUM *foliis linearibus, subintegerrimis. Sawv. Monsp. 87.* Corn Marigold with narrow leaves, which are entire.

6. CHRYSANTHEMUM *foliis pinnatifidis, laciniis parallelis, integris, caule unifloris. Lin. Sp. Plant. 389.* Corn Marigold with many pointed leaves, whose segments are parallel and entire, and one flower on each stalk.

7. CHRYSANTHEMUM *foliis pinnatis, inciso-ferratis, caule multifloro. Prod. Leyd. 174.* Corn Marigold with winged leaves with sawed segments, and many flowers upon a stalk.

8. CHRYSANTHEMUM *foliis pinnatifidis, incis, extrorsum latioribus. Hort. Cliff. 416.* Corn Marigold with wing-pointed cut leaves, whose exterior parts are broadest.

9. CHRYSANTHEMUM *foliis imis palmatis, foliolis linearibus, pinnatifidis. Sawv. Monsp. 304.* Corn Marigold, whose lower leaves are palmated, and the smaller ones linear, and ending in many points.

10. CHRYSANTHEMUM *fruticosum, foliis linearibus dentato-trifidis. Hort. Cliff. 417.* Shrubby Corn Marigold with narrow leaves, having three points, and indented.

11. CHRYSANTHEMUM *flesculis omnibus uniformibus, hermaphroditis. Hort. Cliff. 417.* Corn Marigold, whose florets are all uniform and hermaphrodite.

The first sort is the common Corn Marigold, which grows

naturally amongst the Corn, and in the borders of the Corn fields in divers parts of *England*, so is rarely admitted into gardens, but we have inserted this and the next to introduce the other species.

The second sort is the greater Daisy, which stands in the list of the medicinal plants in the *College Dispensatory*; this grows naturally in moist pastures, almost every where in this country. It rises with stalks near three feet high, which are garnished with oblong indented leaves, that embrace the stalks with their base. The stalks are each terminated by one white flower, shaped like those of the Daisy, but four times as large. It flowers in June.

The third sort grows naturally in *North America*; the roots of this plant creep far under the surface, and send up strong stalks more than four feet high, garnished with long sawed leaves, ending in points; these stalks divide upward into many smaller, each being terminated by a large, white, radiated flower; these appear the end of *August* and *September*; it multiplies very fast by its creeping roots, and will thrive in any soil or situation.

The fourth sort grows naturally upon the *Alps*, and other mountainous places; this sends up a single stalk a foot high, garnished with entire leaves above, but the under leaves are sawed on their edges. The stalk is terminated by one large white flower, shaped like those of the third sort. This sort may be propagated by seeds, which, if sown in a shady border, will come up in about six weeks, and the plants when fit to remove, may be transplanted into a shady border where they are to remain, and will require no other care but to keep them clean from weeds.

The fifth sort grows naturally about *Montpelier*; it hath a perennial root, from which spring up many narrow grass-like leaves, and between them, stalks which rise a foot and an half high, garnished with leaves of the same sort as those below. The stalks are each terminated by one large white flower, with a yellow disk, or middle. It is propagated by parting of the roots; the best time for this is in autumn, that the plants may get good root before winter.

The seventh sort grows naturally on the *Alps*, or other mountainous places in *Germany*; this sends out upright stalks, which are garnished with leaves cut into many parallel segments, somewhat like those of Buckshorn Plantain. The stalks rise a foot and an half high, and are each terminated by a single flower of the same form with those of the last; it hath a perennial root, and may be propagated in the same manner as the other.

The eighth sort hath been many years cultivated in the gardens for the beauty of its flowers; of this there are single and double with white flowers, and the same with yellow. As these do not differ from each other in any respect except in the colour of their flowers, therefore they are generally esteemed but one species; but this is constant, for I have never found the seeds saved from the white, produce plants with yellow flowers, nor those of the yellow produce white.

There is also a variety of these colours with fistular florets, which has accidentally risen from seeds of the other; these are generally titled Quilled-leaved Chrysanthemums, but as the seeds saved from these degenerate to the common sorts, so they do not merit a particular denomination.

These plants are always esteemed as annual, so the seeds are usually sown upon a slender hot bed in the spring, and the plants treated in the same manner as the *African* Marigold, for the culture of which we shall refer the reader to that article; but as the plants which rise from seeds, do many of them produce single flowers, although the seeds are saved from the best double flowers, therefore many persons now propagate these plants from cuttings, whereby they continue the double sorts only; these cuttings, taken from the plants the beginning of *September*, and planted in

pots, will readily take root; and if they are placed under a hot bed frame to screen them from the frost in winter, letting them have free air in mild weather, they will live through the winter, and in the spring these plants may be transplanted into the border of the flower garden, where they will flower in *June*, and continue in succession till the frost puts a stop to them; by this method all the varieties may be continued without variation, but the plants which are propagated this way by cuttings will become barren soon, so will not produce seeds.

The ninth sort is a perennial plant, which sends out many stalks from the root, which divide into branches on every side, and are garnished with pretty thick leaves, deeply cut into many segments, like those of the last sort; these are of a pale green, the flowers are produced at the end of the branches, standing upon pretty long naked foot-stalks; these are very like those of the common Greater Daisy in size and colour. It flowers in *June*, and continues till the end of *September*. This sort ripens seeds every year in *England*, by which the plant is easily propagated. As these plants extend their branches pretty far on every side, so they should be allowed at least two feet room; therefore they are not very proper furniture for small gardens, where there is not room for these large growing plants, but in large gardens these may have a place for the sake of variety.

If these plants are planted in good dry land, or upon lime rubbish, they will not grow so vigorous as in good ground, so they will endure the cold better, and continue longer; for when their leaves and branches are replete with moisture, they are very apt to rot in the winter, so are seldom of long duration; but where the plants have grown from the joints of old walls, I have known them continue in vigour several years.

The tenth sort grows naturally in the *Canary* islands, from whence it was first brought to *England*, where it has been long an inhabitant in some curious gardens. It has been frequently called by the gardeners Pellitory of *Spain*, from the very warm taste which it hath, much resembling the taste of that plant.

This rises with a shrubby stalk near two feet high, dividing into many branches, which are garnished with pretty thick succulent leaves, of a grayish colour, cut into many narrow segments, that are divided into three parts at their extremity. The flowers come out from the wings of the leaves, standing upon naked foot stalks, singly, which greatly resemble those of the common Chamomile; there is a succession of flowers upon the same plants great part of the year, for which it is chiefly esteemed. This plant will perfect seeds in *England*, when the seasons are favourable; but as the cuttings of it do take root so easily, if planted during any of the summer months, so the seeds are rarely sown.

As this plant is a native of warm countries, so it will not live in the open air in *England* during the winter season; therefore when the cuttings have made good roots, they should be each planted into a separate pot, and placed in the shade till they have taken fresh root; then they may be removed to a sheltered situation, where they may remain till autumn, at which time they must be removed into the greenhouse to protect them from frost, but in mild weather they should have plenty of free air, and, during the winter, they should be frequently refreshed with water, but it must not be given them in too great plenty; in summer they will require more moisture, and should be treated in the same manner as other hardier kinds of exotick plants.

The eleventh sort grows naturally at the *Cape of Good Hope*. It rises with a shrubby stalk about two feet high, which divides into many slender branches upward, garnished with oblong leaves, much indented on their edges, each indenture terminating in a soft spine; these are of a pale green,

set close to the branches. The flowers are produced on short foot-stalks from the wings of the leaves, toward the upper part of the branches; these are globular, and formed of a great number of hermaphrodite florets, which are tubular and even, having no rays, so are naked, and of a deep yellow colour. The flowers appear in *June*, and continue in succession till the frost stops them; this may be propagated by cuttings in the same manner as the last, and the plants should be treated in the same way.

CHRYSOBALANUS. *Lin. Gen. Pl.* 585. Cocoa Plum.

The Characters are,

The flower hath five petals and ten stamina, five of which are longer than the petals, the other are shorter. In the center is situated an oval germen, which afterward becomes an oval fleshy berry, inclosing a nut, with five longitudinal furrows.

The Species are,

1. CHRYSOBALANUS *foliis ovatis, emarginatis, scrobis racemosis, caule fruticoso*. Chryso-balanus with oval indented leaves, flowers growing in bunches, and a shrubby stalk; commonly called the Cocoa Plum.

2. CHRYSOBALANUS *foliis decompositis, foliolis ovatis integerrimis*. Chryso-balanus with decomposed leaves, whose lobes are oval and entire,

The first sort grows naturally in the *Babana* islands, and in many other parts of *America*, but commonly near the sea. It rises with a shrubby stalk about eight or ten feet high, sending out several side branches, which are covered with a dark brown bark, spotted with white; these are garnished with oval stiff leaves, which are indented at their ends, in form of a heart, and are placed alternately on the branches; from the wings of the leaves, and also at the division of the branches, the flowers are produced, which grow in loose bunches; these are small and white, having ten stamina in each, five of which stand out beyond the petals of the flowers, the other five are shorter, and are terminated by yellow summits. The flowers are succeeded by oval Plums about the size of Damsons; some of these are blue, some red, and others yellow, they have a sweet luscious taste. The stone of the Plum is shaped like a Pear, and hath five longitudinal ridges on it.

The seeds of the second sort were sent me from *Jamaica*; the stones were exactly the same shape of those of the former, but the plants have winged leaves, which are branched, each having six or seven pair of pinnæ (or lobes). This sort hath not flowered in *England*, so I can give no farther account of it.

As these trees are natives of the warm parts of *America*, so they will not thrive in *England*, unless they are kept in a warm stove. They are propagated by seeds, which must be obtained from the countries where the plants naturally grow; which must be sown in the spring in small pots, and plunged into a hot-bed of tanners bark. In six weeks the plants will come up, and, if properly managed, will be fit to remove in a month's time after, when they should be carefully separated, and each planted into a separate small pot, and then plunged into the hot-bed again, observing to shade them from the sun till they have taken fresh root, after which they must have air every day in proportion to the warmth of the season, and their waterings during the summer should be frequent, but sparing. In the autumn the plants must be removed into the bark stove, and plunged into the tan-bed, and in winter the plants must not have too much water. In summer they must have a good share of air, but the plants should be constantly treated in the same manner as other tender plants from the same countries.

CHRYSOCOMA. *Lin. Gen. Pl.* 845. Goldylocks.

The Characters are,

The flower is composed of many hermaphrodite florets, contained in an imbricated empalement, which are tubular, and funnel-shaped,

shaped, cut into five parts at the brim; these have five short slender stamina. They have an oblong germen, which afterward becomes a single oblong compressed seed, crowned with hairy down.

The Species are,

1. CHRYSOCOMA herbacea, foliis linearibus, glabris, calycibus laxis. *Lin. Sp. Pl.* 841. Herbaceous Goldylocks with narrow smooth leaves, and loose empalements; or, German Goldylocks.

2. CHRYSOCOMA herbacea paniculata, foliis lanceolatis trinerviis, punctatis, nudis. *Lin. Sp. Pl.* 841. Herbaceous Goldylocks with flowers growing in panicles, and spear-shaped leaves, having three nerves.

3. CHRYSOCOMA fruticosa foliis linearibus dorso decurrentibus. *Hort. Cliff.* 397. Shrubby Goldylocks with very narrow leaves, whose back parts run along the stalks.

4. CHRYSOCOMA subfruticosa, foliis linearibus subtus pilosis, floribus ante florescentiam cernuis. *Hort. Cliff.* 397. Shrubby Goldylocks with very narrow leaves, which are hairy on their under side, and flowers nodding before they are blown.

5. CHRYSOCOMA suffruticosa, foliis linearibus recurvis, scabris, ciliatis, floribus erectis. *Lin. Sp. Plant.* 841. Shrubby Goldylocks with narrow rough leaves which are recurved and hairy, and erect flowers.

The first sort grows naturally in Germany, and also in France and Italy; it hath a perennial root and an annual stalk, which rises about a foot and an half high, is round, stiff, and closely garnished with long, narrow, smooth leaves, which come out without any order; the upper part of the stalk divides into many slender foot-stalks, each sustaining a single head of flowers, which are composed of many hermaphrodite florets, contained in one common empalement, having very narrow scales. The flowers are of a bright yellow, and stand disposed on the top of the stalk, in form of an umbel.

This plant is generally propagated by parting of the roots, that being the most expeditious method; for the seedling plants do not flower till the second or third year. The best time to remove the plants and part their roots, is soon after the stalks decay in autumn, that the plants may get fresh roots before winter. It delights in a dry loose soil, in which it will live in the open air, and propagate by its roots very fast, but in strong wet land, the roots often rot in winter.

The second sort grows naturally in Siberia. This plant hath a perennial creeping root, which spreads on every side to a considerable distance, sending up many erect stalks, which are garnished with flat spear-shaped leaves, ending in points; these are rough, and have three longitudinal veins; the upper part of the stalks branch out, and form loose panicles of yellow flowers, which are larger than those of the former sort.

It propagates too fast by its creeping roots to be admitted into the flower garden, for the roots will often extend two or three feet every way, in the compass of one year, so that they will interfere with the neighbouring flowers; but as the plants will grow in any soil or situation, so a few roots may be planted on the side of extensive rural walks round the borders of fields, where they will require no care, and their flowers will make a good appearance, and continue long in beauty.

The third sort grows naturally at the Cape of Good Hope. This rises with a ligneous stalk about a foot high, dividing into many small branches, which are garnished with narrow leaves, of a deep green, coming out on every side without order; the back part of each leaf hath a small short appendix, which runs along the stalks. The flowers are produced at the end of the branches, on slender naked foot-stalks; these are of a pale yellow, and shaped like those of the former sorts, but are larger.

The most expeditious method of propagating this plant is

by cuttings, which, if planted in a common border, in any of the summer months, and covered with hand glasses, will easily take root, provided they are shaded from the sun. When these have gotten good roots they should be carefully taken up, and each planted in a separate pot, placing them in the shade till they have taken new root; then they may be exposed with other hardy exotick plants till autumn, when they must be removed into the green-house during the winter season; they should enjoy a large share of free air in mild weather, for they only require protection from frost, so must not be too tenderly treated.

The fourth sort is a native of the Cape of Good Hope; this is a much less plant than the former, seldom rising above a foot high; it hath a shrubby stalk, branching out in the same manner; the leaves are shorter, and a little hairy; the flowers are not half so large, of a pale sulphur colour, and nod on one side before they are blown. It is generally propagated in the same manner as the former, and the plants require the same treatment.

The fifth sort is also a native of the same country as the two former; this hath a low shrubby stalk, which seldom rises above six inches high, branching out on every side; the leaves come out on every side the branches, which are very narrow, short, rough, and reflexed; the flowers stand single on the top of the foot-stalks, which arise from the upper part of the branches; these flowers are larger than those of the last, and stand erect. This plant requires the same treatment as the two former, and is propagated by cuttings in the same manner.

CHRYSOPHYLLUM. *Lin. Gen. Pl.* 233. Star Apple.

The Characters are,

It hath a bell shaped flower cut at the brim into ten segments, which are alternately spread open; and five short stamina, with a roundish germen, which afterward becomes a pulpy fruit with ten cells, in four or five of which is lodged a single seed.

The Species are,

1. CHRYSOPHYLLUM floribus racemosis terminalibus. *Lin. Syst.* 937. The Star Apple.

2. CHRYSOPHYLLUM floribus lateralibus. *Lin. Syst.* 937. The Damson tree.

Both these trees grow naturally in the West-Indies, where the first sort is often cultivated for its fruit; but the other grows wild in those parts of the islands, which are not cleared of trees.

The first rises thirty or forty feet high, with a large trunk, covered with a brown bark, and divides into many flexible slender branches, which generally hang downward, garnished with spear-shaped leaves, whose under side are of a bright russet colour. The flowers come out at the extremity of the branches, disposed in oblong bunches, which are succeeded by fruit of the size of a Golden Pippin, that are very rough to the palate, and astringent; but if kept some time mellow, as is here practised with Medlars, they have an agreeable flavour.

The second sort never rises to the height of the first, nor do the trunks grow to half the size of those; but the branches are slender, and garnished with leaves like those of the first. The flowers come out in clusters from the side of the branches, which are succeeded by oval smooth fruit about the size of Olives, inclosing three or four hard compressed seeds.

The plants of both these sorts are frequently preserved in those English gardens, where there are large stoves for keeping of exotick plants; for although there is little hopes of having fruit from them in England, yet the colour of their leaves, being so different from those of most other plants, makes a pleasing variety in the stove; and as they retain their leaves all the year, so the plants are as deserving of care as many other which are here cultivated.

They

They are both propagated by seeds, which are frequently brought from the *West-Indies*. They should be sown in small pots, four or five seeds in each, and the pots plunged into a hot-bed of tanners bark: if the seeds are fresh, the plants will come up in five or six weeks after, and in a few weeks more will be fit to remove; then they should be shaken out of the pots, and their roots carefully separated, and each planted in a small pot; then they should be plunged again into a hot-bed of tanners bark, shading them every day until they have got fresh roots, and afterward the plants should be treated in the same way, as has been directed for the tender sorts of *Annona*.

CHRYSOSPLENIUM. *Lin. Gen. Plant.* 493. Golden Saxifrage.

The Characters are,

The flower hath no petals, but eight or ten stamina, which are short, erect, and stand opposite to the angles of the empalement. The germen is immersed in the empalement, which afterward becomes a capsule with two beaks, opening with two valves, and filled with small seeds.

The Species are,

1. **CHRYSOSPLENIUM foliis alternis.** *Flor. Suec.* 317. Golden Saxifrage with alternate leaves.

2. **CHRYSOSPLENIUM foliis oppositis.** *Sauv. Monsp.* 128. Golden Saxifrage with opposite leaves.

These two plants are found growing wild in many parts of *England*, upon marshy soils and bogs, as also in moist shady woods, and are seldom propagated in gardens; where, if any person have curiosity to cultivate them, they must be planted in very moist shady places, otherwise they will not thrive. They flower in *March* and *April*.

CIBOULS, or CHIBOULS. See *Cepa*.

CICER. *Lin. Gen. Pl.* 783. Cicer, or Chich Pease.

The Characters are,

The flower is of the butterfly kind; the standard is large, roundish, and plain; the wings are much shorter and obtuse, the keel is shorter than the wings, and is sharp pointed. It hath ten stamina, nine of them being joined, and the tenth is separate. It hath an oval germen, which afterward becomes a turgid swelling pod of a rhomboidal figure, inclosing two roundish seeds, with a protuberance on their side.

There is but one Species of this genus, viz.

CICER foliolis ferratis. *Hort. Cliff.* 370. Chich Pease with fawed leaves. This is the *Cicer sativum*, *G. B. P.* 347. Garden Chich Pease.

There is a variety of this with a red seed, which differs from it in nothing but the colour.

It is much cultivated in *Spain*, being one of the ingredients in their olios, and is there called *Garavance*; it is also cultivated in *France*, but in *England* it is rarely sown.

The plant is annual, shooting out several stalks from the root, which are about two feet long; these are hairy, and garnished with long winged leaves of a grayish colour, composed of seven or nine pair of small roundish leaves (or lobes) terminated by an odd one, which are fawed on their edges. From the side of the branches come out the flowers, sometimes one, at other times two together. They are shaped like those of Pease, but are much smaller and white, standing on long foot-stalks, and are succeeded by short hairy pods, including two seeds in each, which are the size of common Pease, but have a little knob or protuberance on one side.

The seeds of this plant may be sown in the spring, in the same manner as Pease, making drills with a hoe, about an inch and an half deep, in which the seeds should be sown at about two inches asunder, then with a rake draw the earth into the drill to cover the seeds. The drills should be made at three feet distance from each other, that there may be room for their branches to spread, when the plants are fully grown, as also to hoe the ground between them, to

keep it clean from weeds, which is all the culture these plants require.

This plant flowers in *June*, and the seeds ripen in *August*; but unless the season proves warm and dry, the plants decay before the seeds are ripe.

CICHORIUM. *Lin. Gen. Plant.* 825. Succory.

The Characters are,

The flower hath a common scaly empalement, which at first is cylindrical, but is afterward expanded; the scales are narrow, spear-shaped, and equal. The flower is composed of many hermaphrodite florets, with one petal, which is tongue-shaped, and cut into five segments. These have five short hairy stamina. The germen is situated under the petal, which afterward becomes a single seed, inclosed with a down, and shut up in the empalement.

The Species are,

1. **CICHORIUM caule simplici, foliis dentato sinuatis.** *Flor. Suec.* 650. Succory, with a single stalk and indented sinuated leaves; or, Wild Succory.

2. **CICHORIUM caule dichotomo spinoso.** *Hort. Cliff.* 388. Succory with a prickly stalk divided by pairs.

3. **CICHORIUM caule simplici, foliis integris, crenatis.** *Hort. Cliff.* 389. Succory with a single stalk, and entire crenated leaves.

4. **CICHORIUM caule simplici, foliis fimbriatis, crispis.** Succory with a single stalk, and fringed, curled leaves.

The first sort grows naturally by the sides of roads and in shady lanes, in many parts of *England*: this has been supposed to be no other way differing from the Garden Succory, but by the latter being cultivated in gardens; indeed, most of the writers on botany, have confounded the two sorts together; for the Garden Succory which is described in most of the old books, I take to be the broad-leaved Endive, which is the third sort here enumerated, for I have many years cultivated both sorts in the garden, without finding either of them alter. There is an essential difference between these, for the wild Succory hath a perennial creeping root, whereas the other is at most but a biennial plant; and if the seeds of the latter are sown in the spring, the plants will flower and produce seeds the same year, and perish in autumn, so that it may rather be called annual. The wild Succory sends out from the roots long leaves, which are jagged to the midrib, each segment ending in a point; from between these arise the stalks, which grow from three to four feet high, garnished with leaves, shaped like those at the bottom, but smaller, and embrace the stalks at their base. These branch out above into several smaller stalks, which have the same leaves, but smaller and less jagged; the flowers are produced from the side of the stalks, which are of a fine blue colour, and are succeeded by oblong seeds, inclosed in a down.

The second sort grows naturally on the sea coasts in *Sicily* and the islands of the *Archipelago*. This sends out from the root many long leaves, which are indented on their edges, and spread flat on the ground; from between these arise the stalks, which have very few leaves, and those are small and entire: these stalks are divided in forks upward, from between these come out the flowers, which are of a pale blue, and are succeeded by seeds shaped like those of the common sort; the ends of the smaller branches are terminated by star-like spines, which are very sharp. This plant is biennial with us in *England*, and in cold winters is frequently killed. It flowers and seeds about the same time with the former sort, and may be treated in the same way as the Endive.

The broad-leaved Succory or Endive, differs from the wild sort in its duration, the root always perishing after it has ripened seeds: the leaves are broader, rounder at the top, and not lacinated on the sides as the leaves of the wild; the branches are more horizontal, and the stalks never rise so high.

There is also a variety with very long broad leaves, called in *Spain* *Escharole*, which is very tender and good, but

is often injured by frosts in the autumn, so is less esteemed on that account in *England*.

All the sorts of Succory are esteemed aperitive and diuretick, opening obstructions of the liver, and good for the jaundice; it provokes urine, and cleanses the urinary passages of slimy humours, which may stop their passage.

The curled Endive is now much cultivated in the *English* gardens, being one of the principal ingredients in the fallads of autumn and winter, for which purpose it is continued as long as the season will permit. I shall therefore give directions for the managing of this plant, so as to have it in perfection during the autumn and winter months.

The first season for sowing of these seeds is in *June*, for those which are sown earlier in the year, generally run up to seed, before they have arrived to a proper size for blanching; and it frequently happens, that the seeds sown in *June* in the rich grounds near *London*, will run to seeds the same autumn; but in situations that are colder, they are not so apt to run up, therefore there should be some seeds sown about the middle or latter end of that month. The second sowing should be about the beginning of *July*, and the last time in the middle of *July*. From these three different crops, there will be a supply for the table during the whole season; for there will be plants of each sowing, very different in their growth, so that there will be three different crops from the same beds.

When the plants come up they must be kept clean from weeds, and in dry weather duly watered, to keep them growing till they are fit to transplant, when there should be an open spot of rich ground prepared to receive the plants, in size proportionable to the quantity intended. When the ground is well dug and levelled, if it should be very dry, it must be well watered to prepare it to receive the plants; then the plants should be drawn up from the seed bed carefully, so as not to break their roots, drawing out all the largest plants, leaving the small ones to get more strength; which, when they have room to grow, by taking away the large ones, they will soon do. As the plants are drawn up, they should be placed with their roots even, all the same way, and every handful as they are drawn, should have the tops of their leaves shortened, to make them of equal length: this will render the planting of them much easier, than when the plants are promiscuously mixed, heads and tails: then the ground should be marked out in rows at one foot asunder, and the plants set ten inches distant in the rows, closing the earth well to their roots; let them be well watered, and repeat this every other evening, till the plants have taken good root, after which they must be kept clean from weeds.

When the plants of the seed bed have been thus thinned, they should be well cleaned from weeds, and watered, which will encourage the growth of the remaining plants, so that in ten days or a fortnight after, there may be another thinning made of the plants, which should be transplanted in the same manner. And at about the same distance of time, the third and last drawing of plants may be transplanted.

Those plants which were the first transplanted, will be fit to blanch by the latter end of *August* at farthest; and if they are properly managed, in three weeks or a month, they will be sufficiently blanched for use, which will be as soon as these fallads are commonly required; for during the continuance of good Cos Lettuce, few persons care for Endive in their fallads; nor, indeed, is it so proper for warm weather. If any of the plants should put out flower stems, they should be immediately pulled up and carried away, being good for nothing, so should not be left to incommode the neighbouring plants. As the quantity of roots necessary for the supply of a middling family is not very great, so there should not be too many plants tied up to blanch at the same time; therefore the largest should be first tied, and in a week after those

of the next size; so that there may be three different times of blanching the plants, on the same spot of ground. But as in some large families there is a great consumption of this herb for soups, so the quantities of plants should be proportionably greater, at each time of planting and blanching. The manner of blanching is the next thing to be treated of, therefore in order to this you should provide a parcel of small Osier twigs (or bafs mat) to tie up some of the largest heads to blanch; which should be done in a dry afternoon, when there is neither dew nor rain to moisten the leaves in the middle of the plants, which would occasion their rotting soon after their being tied up. The manner of doing it is as follows, *viz.* You must first gather up all the inner leaves of the plant in a regular order, into one hand, and then take up those on the outside that are sound, pulling off and throwing away all the rotten and decayed leaves which lie next the ground; observing to place the outside leaves all round the middle ones, as near as possible to the natural order of their growth, so as not to cross each other: then having got the whole plant close up in your hand, tie it up with the twig, bafs, &c. at about two inches below the top, very close; and about a week after go over the plants again, and give them another tie about the middle of the plant, to prevent the heart leaves from bursting out on one side; which they are subject to do, as the plants grow, if not prevented this way.

In doing of this you need only tie up the largest plants first, and so go over the piece once a week, as the plants increase in their growth; by which means you will continue the crop longer, than if they were all tied up at one time: for when they are quite blanched, which will be in three weeks or a month after tying, they will not hold sound and good above ten days or a fortnight, especially if the season proves wet: therefore it is that I would advise you to sow and plant at three or four different seasons, that you may have a supply as long as the weather will permit. But in order to this, you must transplant all the plants of the last sowing under warm walls, pales, or hedges, to screen the plants from frost; and if the winter should prove very sharp, you should cover them with some Pease haulm, or such other light covering, which should be constantly taken off in mild weather: these borders should also be as dry as possible, for these plants are very subject to rot, if planted in a moist soil in winter.

Although I before directed the tying up of the plants to blanch them, yet this is only to be understood for the two first sowings; for after *October*, when the nights begin to be frosty, those plants which are so far above ground will be liable to be much prejudiced thereby, especially if they are not covered in frosty weather; therefore the best method for the late crops is, to take up your plants in a very dry day, and with a large flat pointed dibble, plant them into the sides of trenches of earth, which should be laid very upright, sideways, towards the sun, with the tops of the plants only out of the ground, so that the hasty rains may run off, and the plants be kept dry, and secured from frosts.

The plants thus planted, will be blanched fit for use in about three weeks or a month's time, after which it will not keep good long; you should therefore keep planting some fresh ones into trenches every week or fortnight at farthest, that you may have a supply for the table; and those which were last transplanted out of the seed beds, should be preserved till *February* or *March*, before they are planted to blanch, so that from this you may be supplied until the beginning of *April*, or later: for at this last planting into the trenches, it will keep longer than in winter, the days growing longer; and the sun, advancing with more strength, dries up the moisture much sooner than in winter, which will prevent the rotting of these plants.

When your Endive is blanched enough for use, you must dig it up with a spade; and after having cleared it from all the outside green and decayed leaves, you should wash it well in two or three different waters to clear it the better from slugs, and other vermin, which commonly shelter themselves amongst the leaves thereof, and then you may serve it up to the table with other fallading.

But in order to have a supply of good seeds for the next season, you must look over those borders where the last crop was transplanted, before you put them into the trenches to blanch; and make choice of some of the largest, soundest, and most curled plants, in number according to the quantity of seeds required: for a small family, a dozen of good plants will produce seeds enough; and for a large, two dozen or thirty plants.

These should be taken up and transplanted under a hedge or pale, at about eighteen inches distance, in one row, about ten inches from the hedge, &c. This work should be done in the beginning of *March*, if the season is mild, otherwise it may be deferred a fortnight longer. When the flower stems begin to advance, they should be supported with a packthread, which should be fastened to nails driven into the pale, or to the stakes of the hedge, and run along before the stems, to draw them upright close to the hedge or pale, otherwise they will be liable to break with the strong winds. Observe also to keep them clear from weeds, and about the beginning of *July* your seeds will begin to ripen; therefore, as soon as you find the seeds quite ripe, you must cut off the stalks, and expose them to the sun upon a coarse cloth to dry; and then beat out the seeds, which must be dried, and put up in bags or paper, and preserved for use in some dry place. But I would here caution you, not to wait for all the seeds ripening upon the same plant; for if so, all the first ripe and best of the seeds will scatter and be lost before the other are near ripe; so great a difference is there in the seeds of the same plant being ripe.

The wild Succory (of which there are some varieties in the colour of the flowers) is seldom propagated in gardens; it growing wild in unfrequented lanes and dunghills in divers parts of *England*, where the herbwomen gather it, and supply the markets for medicinal use.

CICUTA. *Lin. Gen. Pl.* 316. Water Hemlock.

The Characters are,

It is a plant with an umbellated flower; the principal umbel is composed of several smaller. The great umbel hath no involucre, but the smaller have, which are composed of many short leaves. The flowers have each five oval petals; they have five hairy stamina. The germen is situated below the flower, which afterward becomes a roundish channelled fruit dividing in two parts, containing two oval seeds, plain on one side and convex on the other.

The Species are,

1. CICUTA *umbellis folio oppositis, petiolis marginatis obtusis.* *Lin. Sp. Plant.* 255. Hemlock with umbels opposite to the leaves, and obtuse marginated foot-stalks. Water Hemlock.

2. CICUTA *foliorum serraturis mucronatis, petiolis membranaceis, apice bilobis.* *Lin. Sp. Pl.* 256. Hemlock with pointed serratures to the leaves, and membranaceous foot-stalks ending in two lobes.

The first sort grows naturally in standing waters in many parts of *England*, so is never propagated; for unless there is a considerable depth of standing water for the plants to root in, they will not grow.

It rises four or five feet high, with a branching hollow stalk, garnished with winged leaves: the stalks are terminated by umbels of yellowish flowers, which are succeeded by small channelled seeds like those of Parsley. It flowers in *June* and *July*, and the seeds ripen in autumn.

The second sort grows naturally in *North America*. This is

propagated by seeds, which should be sown in autumn, in a shady border, where the plants will come up in the spring, and require no other care but to keep them clean.

CICUTARIA. See Ligusticum.

CINARA. See Cynara.

CINERARIA. See Othonna.

CIRCEA. *Lin. Gen. Pl.* 24. Enchanter's Nightshade.

The Characters are,

The flower hath two heart-shaped petals; it hath two erect hairy stamina. The germen is situated under the flower; the empalement afterward becomes an oval capsule with two cells opening lengthways, each containing a single oblong seed.

The Species are,

1. CIRCEA *caule erecto, racemis pluribus.* *Lin. Sp. Plant.* 9. Common Enchanter's Nightshade.

2. CIRCEA *caule adscendente, racemo unico.* *Lin. Sp. Pl.* 9. Least Enchanter's Nightshade.

The first sort grows naturally in shady woods, and under hedges, in many parts of *England*. It hath a creeping root, by which it multiplies greatly. The stalks are upright, and rise a foot and half high, garnished with heart-shaped leaves placed opposite, upon pretty long foot-stalks: they are of a dark green on their upper side, but are pale on their under. The stalks are terminated by loose spikes of flowers, which are branched out into three or four small divisions. The flowers are small and white, having but two petals, opposite to which are situated the two stamina. After the flowers fall away, the empalement of the flower becomes a rough capsule, inclosing two oblong seeds.

The second sort grows at the foot of mountains in many parts of *Germany*; it also grows naturally in a wood near the *Hague*, from whence I brought it to *England*. This sort seldom rises more than six inches high, with a slender stalk, garnished with leaves shaped like those of the former sort, but smaller, and are indented on their edges. The flowers are produced on single loose spikes at the top of the stalks, which are smaller than those of the former sort, but of the same form and colour. They both multiply exceedingly by their creeping roots, so are seldom kept in gardens, unless for the sake of variety.

CIRSIUM. See Carduus.

CISSAMPELOS. *Lin. Gen. Pl.* 993.

The Characters are,

It is male and female in different plants; the male flowers have no petals, but a single style rises in the center, which extends beyond the empalement, terminated by a large summit having four lobes. The female flowers have four nectariums standing round the oval germen, which is hairy, and afterward becomes a succulent berry inclosing a single seed.

The Species are,

1. CISSAMPELOS *foliis peltatis cordatis subtus villosis, floribus racemosis alaribus.* Cissampelos with target heart-shaped leaves which are hairy, and flowers growing in bunches rising from the side of the stalks.

2. CISSAMPELOS *foliis cordatis, tomentosiss, floribus racemosis, alaribus.* Cissampelos with woolly heart-shaped leaves, and flowers growing in bunches from the sides of the stalks; called Velvet Leaf in *America*.

These plants grow naturally in the warmest parts of *America*, where they twist themselves about the neighbouring shrubs, and rise to the height of five or six feet. The first sort hath round heart-shaped leaves, whose foot-stalks are set within the base of the leaf, resembling an ancient target; these are hairy on the under side, and have pretty long slender foot-stalks. Toward the upper part of the stalks, the flowers come out from the wings of the leaves; those of the male plants grow in short spikes or clusters, and are of a pale herbaceous colour; but the female flowers are produced in long loose racemi from the side of the stalks,

and are succeeded by a single pulpy berry inclosing a single seed.

The second sort hath round heart-shaped leaves, which are extremely woolly and soft to the touch; these have their foot-stalks placed at the base, between the two ears; the flowers of this come out in bunches from the side of the stalks, in the same manner as the first. The stalks and every part of the plant, is covered with a soft woolly down.

These plants are propagated by seeds, which should be sown upon a hot-bed in the spring; and the plants must afterward be treated in the same way as other tender exoticks, keeping them constantly in the bark stove, otherwise they will not live in this country.

The first sort is supposed to be the Pareira, whose root has been so much esteemed as a diuretick.

CISTUS. *Lin. Gen. Plant.* 598. Rock-rose.

The Characters are,

The flower hath five large roundish petals which spread open; it hath a great number of hairy stamina, which are shorter than the petals. In the center is situated a roundish germen, which afterward becomes an oval close capsule, having in some five, and others ten cells, filled with small roundish seeds.

The Species are,

1. CISTUS *arborescens foliis ovatis, sessilibus, utrinque villosis, rugosis, floribus terminalibus.* Tree Rock-rose with oval leaves growing close to the branches, which are hairy and rough, and flowers growing at the end of the branches.

2. CISTUS *arborescens foliis sessilibus, utrinque villosis, rugosis: inferioribus ovatis basi connatis, summis lanceolatis.* *Hort. Cliff.* 205. Tree Rock-rose with leaves set close to the branches, which are hairy and rough on each side, the under being oval and joined at their base, but the upper spear-shaped.

3. CISTUS *arborescens, foliis ovato-lanceolatis, basi connatis, hirsutis, rugosis, pedunculis florum longioribus.* Tree Rock-rose with oval spear-shaped leaves, joined at their base, which are hairy and rough, and longer foot-stalks to the flowers.

4. CISTUS *arborescens, foliis ovatis, obtusis, villosis, subtus nervosis rugosis, floribus amplioribus.* Tree Rock-rose, with oval, obtuse, hairy leaves, which are nervous and rough on their under side, and larger flowers.

5. CISTUS *arborescens villosus, foliis lanceolatis, viridibus, basi connatis, floribus alaribus & terminalibus sessilibus, calycibus acutis.* Hairy Tree Rock-rose with green spear-shaped leaves joined at their base, flowers proceeding from the sides and ends of the branches, fitting close to the stalks, and sharp pointed empalements.

6. CISTUS *arborescens foliis lanceolatis, supra lævibus, petiolis basi coalitis vaginantibus.* *Hort. Cliff.* 205. Tree Rock-rose with spear shaped leaves, smooth on their upper side, and their foot-stalks joining like sheaths.

7. CISTUS *arborescens foliis oblongis, tomentosis, incanis, basi connatis, supra lævibus infernè nervosis.* Tree Rock-rose, with oblong, hoary, woolly leaves, joined at their base, smooth above, but nervous on their under side.

8. CISTUS *frutescens, ramis patulis, foliis ovatis, petiolatis, hirsutis, pedunculis nudis.* Shrubby Rock-rose, with spreading branches, oval, hairy leaves having foot-stalks, and the foot-stalks of the flowers naked.

9. CISTUS *arborescens, foliis ovato-lanceolatis, hirsutis, marginibus undulatis, floribus terminalibus.* Tree Rock-rose with oval, spear-shaped, hairy leaves, waved on their borders, and flowers terminating the branches.

10. CISTUS *fruticosus, foliis lineari-lanceolatis, hirsutis, sessilibus, floribus terminalibus.* Shrubby Rock-rose with narrow, spear-shaped, hairy leaves, fitting close to the branches, and flowers terminating the stalks.

11. CISTUS *arborescens, foliis lanceolatis, supra lævibus, pe-*

tiolis basi, coalitis vaginantibus. *Lin. Sp. Pl.* 523. Tree Rock-rose, with spear-shaped leaves, smooth on their upper side, with foot-stalks joined at their base.

12. CISTUS *foliis oblongo-cordatis, glabris, petiolis, longioribus, caule fruticoso.* Rock-rose with oblong, heart-shaped, smooth leaves, longer foot-stalks, and a shrubby stalk.

13. CISTUS *arborescens, foliis lanceolatis, sessilibus, utrinque villosis, trinerviis, alis nudis.* *Hort. Cliff.* 205. Tree Rock-rose with spear-shaped leaves fitting close to the branches, hairy on both sides, having three nerves.

14. CISTUS *arborescens, foliis lineari-lanceolatis, subtus incanis, trinerviis, petalis subrotundis.* Tree Rock-rose with narrow spear-shaped leaves, hoary on their under side, having three nerves, with roundish petals.

15. CISTUS *foliis lanceolatis, supernè glabris, infernè incanis, trinerviis, margine undulatis, caule fruticoso.* Rock-rose with spear-shaped leaves, which are smooth on their upper side, and hoary on their under, having three nerves, waved edges, and a shrubby stalk.

16. CISTUS *arborescens foliis cordatis lævibus acuminatis petiolatis.* *Lin. Sp. Pl.* 523. Tree Rock-rose with heart-shaped, pointed leaves.

17. CISTUS *foliis ovatis, incanis, infernè petiolatis, supernè coalitis, caule fruticoso.* Rock-rose with oval, hoary leaves, those beneath having foot-stalks, the upper ones joined at their base, and a shrubby stalk.

18. CISTUS *foliis lineari-lanceolatis, incanis, sessilibus, floribus racemosis caule fruticoso.* Rock-rose with narrow spear-shaped leaves, which are hoary, and fit close to the branches, flowers growing in clusters, and a shrubby stalk.

These plants grow naturally in the south of France, Spain, and Portugal.

The first sort hath a strong woody stem, covered with a rough bark, which rises three or four feet high, dividing into many branches, so as to form a large bushy head; these are garnished with oval hairy leaves, placed opposite, and fit close to the branches, having several smaller leaves of the same form rising from the same joint. The flowers are produced at the end of the branches, four or five standing together, almost in the form of an umbel, but rarely more than one is open at the same time: these are composed of five large roundish petals of a purple colour, which spread open like a Rose, having a great number of stamina. These flowers are of but short duration, generally falling off the same day they expand, but there is a succession of fresh flowers every day for a considerable time. After the flowers are past, the germen swells to an oval seed vessel, sitting in the empalement, which is hairy; these capsules have ten cells, which are full of small roundish seeds.

The second sort differs from the first in the shape of the leaves, which are longer and whiter; those on the lower part of the branches are oval, and join at their base, surrounding the stalks, but the upper leaves are spear shaped and distinct; the flowers are larger, and of a paler purple colour.

The third sort differs from both the former, in having shorter and greener leaves, which are joined at their base, and are hairy. The foot-stalks of the flowers are much longer, and the flowers are smaller, but of a deeper purple.

The fourth sort hath much larger and rounder leaves than either of the former, which are hairy, and smooth on their upper side, but rough and full of veins on their under: the branches are white and hairy, and the flowers are very large, and of a light purple colour.

The fifth sort doth not rise so high as either of the former, but sends out branches near the root, which are hairy and erect; these are garnished with spear-shaped leaves, which are of a dark green colour, and join at their base, surrounding the stalk. At each joint comes out a very slender branch,

branch, having three pair of small leaves of the same shape with the other, terminated by a single flower, and the ends of the branches have three or four flowers sitting close without foot-stalks. The flowers are of a deep purple colour, and like those of the first.

The sixth sort rises to the height of five or six feet, with a strong woody stalk, sending out many hairy branches, which are garnished with spear-shaped leaves, smooth on their upper side, but veined on their under, having short foot-stalks, which join at their base, where they form a sort of sheath to the branch. The flowers come out at the end of the branches, which are large, of a light purple colour, resembling those of the fourth sort.

The seventh sort hath erect branches, which come out from the lower part of the stalk, and are woolly; these are garnished with oblong hoary leaves, covered with a white down, which are smooth above, but veined on the under side, joining at their base, where they surround the stalk; the flowers are produced at the end of the branches, which are of a bright purple colour, and large.

The eighth sort hath a slender smooth stalk, covered with a brown bark, which never rises more than two feet high, sending out many horizontal weak branches, which spread very wide, and are garnished with small oval leaves, which are hairy, standing upon short foot-stalks. The flowers come out at the wings of the leaves, upon long naked foot-stalks; these are white, and somewhat smaller than those of the other sorts.

The ninth sort grows naturally in the islands of the *Archipelago*, and is the plant which produces the *Ladanum*, as is hereafter mentioned; it rises three or four feet high, with a woody stalk, sending out many lateral branches covered with a brown bark, garnished with oval, spear shaped, hairy leaves, waved and curled on their borders; these in warm seasons sweat a glutinous liquid, which spreads on the surface of the leaves, is very clammy and sweet-scented. The flowers come out at the end of the branches, on short hairy foot-stalks; they are of a deep purple colour, and about the size of a single Rose.

The tenth sort rises with a shrubby stalk about four feet high; the branches are very hairy, glutinous, and grow erect, and are garnished with long narrow leaves, ending in points, which are hairy, and of a deep green on both sides, having a deep longitudinal furrow on their upper side, made by the midrib, which is prominent on the under side; the flowers stand upon long foot-stalks at the end of the branches, which are of a pale sulphur colour, having a bordered empalement, which is cut into five acute parts at the top.

The eleventh sort rises with a strong woody stem, to the height of five or six feet, sending out many erect branches, which are garnished with spear-shaped leaves ending in points; these are thick, white on their under side, of a dark green above, and very glutinous in warm weather. The flowers are produced at the end of the branches, upon long naked foot-stalks, which branch on their sides into small foot-stalks, each sustaining one large white flower, having a hairy empalement.

The twelfth sort rises with a smooth shrubby stalk, four or five feet high, sending out many slender ligneous branches, covered with a smooth brown bark, garnished with oblong heart-shaped leaves, which are smooth, and have long foot-stalks. The flowers are white, and are produced at the end of the branches, standing upon pretty long foot-stalks.

The thirteenth sort rises with a slender shrubby stalk, from three to four feet high; sending out many branches from the bottom upward, which are hairy, garnished with spear-shaped leaves, of a very dark green colour, having

three longitudinal veins in each; in warm weather they are covered with a glutinous sweet-scented substance, which exudes from their pores. The flower-stalks which come out at the end of the branches, are long, naked, and sustain many white flowers, rising above each other; their empalements are bordered, and end in sharp points.

The fourteenth sort rises with a woody stem to the height of five or six feet, sending out many side branches from the bottom; these are smooth, covered with a reddish brown bark, garnished with narrow spear-shaped leaves, whitish on their under side, of a dark green above, having three longitudinal veins. The flowers are produced at the end of the branches, on short foot-stalks, and are composed of five very large roundish petals, each having a large purple spot at their base. The whole plant exudes a sweet glutinous substance in warm weather, which hath a very strong balsamick scent, so as to perfume the circumambient air to a great distance.

There is a variety of this with white flowers, having no purple spots, which is in all other respects the same as this.

The fifteenth sort rises with a shrubby stalk to the same height as the last, sending out many branches on every side, which are garnished with spear-shaped leaves, of a thick consistence, which are smooth on their upper side, of a very dark green colour, and white on their under side; these are very clammy, especially in warm weather; the flowers are produced at the end of the branches, on short foot-stalks; they are very large, white, and have a broad, dark, purple spot at the base of each petal; this differs from the former sort in the shape and size of their leaves; those of this sort being much shorter and broader, and are very white on their under side. The side branches are shorter, and the leaves stand much closer on them; the flowers are larger, and the whole plant is much more glutinous.

The sixteenth sort hath a stiff, slender, woody stalk, which sends out many branches, it rises to the height of six or seven feet; the leaves are large, heart-shaped, thin, and of a light green colour; these sit close to the branches, and have many nerves; the flowers are produced at the end of the branches, upon naked foot-stalks; they are white, and fade to a pale sulphur colour when they fall off.

The seventeenth sort hath an upright shrubby stalk, which rises four or five feet high, sending out many branches from the ground upward, so as to form a large bush. The branches are channelled, and hoary. The leaves are oval, standing opposite; those on the lower part of the branches have foot-stalks, but upward they coalesce at their base, and surround the stalk; these are very white. The foot-stalks of the flowers which rise at the end of the branches, are a foot in length, naked, hairy, and put out two or four shorter foot-stalks on the side, each supporting three or four flowers, each standing on a short foot-stalk. The flowers are large, of a bright yellow colour, but of short duration, seldom continuing longer than three or four hours.

The eighteenth sort rises with a slender woody stalk, three or four feet high, sending out many slender branches, garnished with narrow, spear-shaped, hoary leaves, which sit close to them; from the wings of the leaves come out slender branches, which have two or three pair of small leaves, terminated by loose bunches of flowers, each standing on a slender foot-stalk. The flowers are of a dirty sulphur colour.

This sort will not live abroad in the winter, so is always placed in a green-house.

These plants are all of them, except the last, hardy enough to live in the open air in *England*, unless in very severe winters, which sometimes destroy them, so that a plant or two of each sort may be kept in pots, and sheltered in winter, to preserve the kinds; the rest may be intermixed with

other

other shrubs, for where they are sheltered by other plants, they will endure the cold much better than where they are scattered singly in the borders. Many of these plants will grow to the height of five or six feet, and will have large spreading heads, provided they are permitted to grow uncut; but if they are ever trimmed, it should be only so much as to prevent their heads from growing too large for their stems; for whenever this happens, they are apt to fall on the ground, and appear unsightly.

These shrubs are propagated by seeds, and also from cuttings; but the latter method is seldom practised, unless for those sorts which do not produce seeds in *England*; these are the twelfth, seventeenth, and eighteenth sorts; all the others generally produce plenty of seeds, especially those plants which came from seeds, for those which are propagated by cuttings, are very subject to become barren, which is also common to many other plants.

The seeds of these plants may be sown in the spring upon a common border of light earth, where the plants will come up in five or six weeks, and, if they are kept clear from weeds, and thinned where they are too close, they will grow eight or ten inches high the same year; but as these plants, when young, are liable to injury from hard frost, therefore they should be transplanted when they are about two inches high, some into small pots filled with light earth, that they may be removed into shelter in winter, and the others into a warm border, at about six inches distance each way; those which are potted must be set in a shady situation till they have taken new root, and those planted in the border must be shaded every day with mats till they are rooted, after which the latter will require no other care but to keep them clean from weeds till autumn, when they should have hoops placed over them, that they may be covered in frosty weather; those in the pots may be removed into an open situation, so soon as they have taken new root, where they may remain till the end of *October*; then they should be placed under a hot-bed frame to screen them from the cold in winter, but, at all times, when the weather is mild, they should be fully exposed to the open air, and only covered in frosts; with this management the plants will thrive much better than when they are more tenderly treated.

In the spring following, these plants may be turned out of the pots, with all the earth preserved to their roots, and planted in the places where they are to remain (for they are bad plants to remove when grown old), observing to give them now and then a little water, until they have taken fresh root; after which time they will require no farther care, than to train them upright in the manner you would have them grow. The plants which were planted in the border also may be transplanted abroad the succeeding spring. In removing of these you should be careful to preserve as much earth about the roots as you can; and if the season should prove hot and dry, you must water and shade them, until they have taken fresh root, after which they will require no other culture than was before directed.

The fourteenth and fifteenth sorts are by much the most beautiful of all these *Cistus*; the flowers, which are as big as a large Rose, are of a fine white, with a deep purple spot on the bottom of each leaf. These plants also abound with a sweet glutinous liquor, which exudes through the pores of the leaves in so plentiful a manner, in hot weather, that the surface of the leaves are covered therewith; from this plant *Clusius* thinks might be gathered great quantities of the *Ladanum* which is used in medicine, in the woods in *Spain*, where he saw vast quantities of this shrub growing.

But it is from the ninth sort, which *Monf. Tournefort* says, the *Greeks*, in the *Archipelago*, gather this sweet gum; in the doing of which (*Bellonius* says) they make use of an instrument like a rake without teeth, which they call *Ergastiri*;

to this are tied many thongs of raw and untanned leather, which they rub gently on the bushes that produce the *Ladanum*, that so that liquid moisture may stick upon the thongs; after which they scrape it off with knives; this is done in the hottest time of the day, for which reason the labour of gathering this *Ladanum* is excessive, and almost intolerable, since they are obliged to remain on the mountains for whole days together, in the very heat of summer, or the dog days, nor is there any person almost that will undertake this labour, except the *Greek* monks.

CITHAREXYLON. *Lin. Gen. Pl.* 678. Fiddle Wood.

The Characters are,

The flower is of one leaf, funnel-shaped, and divided at the top into five equal parts. It hath four stamina which adhere to the tube, two of them being longer than the other. In the center is situated the roundish germen, which after-ward becomes a capsule with two cells, each having a single seed.

The Species are,

1. CITHAREXYLON *foliis ovato-lanceolatis venosis, dentatis, ramis angulatis, floribus racemosis, sparsis.* This is the common Fiddle Wood of *America*.

2. CITHAREXYLON *foliis oblongo-ovatis, integris, oppositis, ramis angulatis, floribus spicatis.* Fiddle Wood with oblong, oval, entire leaves growing opposite, angular branches, and flowers growing in spikes.

The first sort grows common in most of the islands in the *West-Indies*, where it rises to a great height, and becomes a very large timber tree, the wood of which is greatly esteemed for buildings, being very durable.

This rises with an upright trunk to the height of fifty or sixty feet, sending out many branches, which have several angles or ribs, running longitudinally, garnished by oval, spear-shaped leaves at every joint, standing in a triangle, upon short foot-stalks. The leaves are about four inches long, and one and an half broad, of a lively green colour, pretty much notched on their edges, having several deep Orange-coloured veins running from the midrib to the edges. The flowers come out from the sides, and also at the end of the branches, in loose bunches, which are succeeded by small pulpy berries, inclosing two seeds in each.

The second sort is a native of the same islands with the first. This is also a very large tree, whose timber is greatly valued in *America*, for buildings, being very durable, and from thence I have been informed the *French* gave it the name of *Fidelle Wood*, which the *English* have rendered *Fiddle Wood*.

This tree rises with a strong upright trunk, to the height of sixty feet, or more, sending out many angular branches, standing opposite, garnished with oval oblong leaves, standing opposite, on short foot-stalks; these are of a lucid green, and are rounded at their ends. The flowers come out in long loose spikes toward the end of the branches, which are white, and smell very sweet; these are followed by small, roundish, pulpy berries, each inclosing a single seed.

The seeds of both sorts should be sown in small pots early in the spring, and plunged into a fresh hot-bed of tanners bark, and treated in the same manner as other exotick seeds, which are brought from hot countries. If the seeds are fresh, the plants will appear in five or six weeks, and in about one month more will be fit to transplant; when each should be planted in a small pot, and plunged into the hot-bed again, observing to shade them till they have taken fresh root, after which they should have a large share of air in warm weather; in autumn the plants should be removed into the bark stove, where it will be proper to keep them the first winter, till they have obtained strength, but afterward they may be kept in a dry stove in winter, and in the middle of summer they may be exposed in the open air for two months, in a warm situation, with which management the plants

plants will make better progress than when they are more tenderly treated.

If the cuttings of this plant are planted in small pots during the summer months, and plunged into a moderate hot-bed, they will take root, and may afterward be treated in the same manner as the seedling plants.

CITRUS. *Lin. Gen. Pl.* 807. The Citron tree.

The Characters are,

The flower hath five oblong thick petals; it hath ten stamina, which are not equal, and join in three bodies at their base. The oval germen in the center afterward becomes an oblong fruit, with a thick fleshy skin filled with a succulent pulp, having many cells, each containing two oval hard seeds.

The Species are,

1. **CITRUS fructu oblongo, majori, mucronato, cortice crasso rugoso.** Citron with a larger, oblong, pointed fruit, having a thick rough rind; or, Sweet Citron.

2. **CITRUS fructu oblongo, cortice tuberoso rugoso.** The common Citron.

There are several other varieties of this fruit, with which the English gardens have been supplied from Genoa, where is the great nursery for the several parts of Europe for this sort, as also Orange and Lemon trees.

The several sorts of Citrons are cultivated in much the same manner as the Orange tree, to which I shall refer the reader, to avoid repetition; but shall only remark, that these are somewhat tenderer than the Orange, and should therefore have a warmer situation in winter, otherwise they are very subject to cast their fruit. They should also continue a little longer in the house in the spring, and be carried in again sooner in the autumn. And as their leaves are larger, and their shoots stronger, than those of the Orange, they require a little more water in the summer; but in the winter they should have little water at each time, which must be the oftener repeated.

The common Citron is much the best stock to bud any of the Orange or Lemon kinds upon, it being the straightest and freest growing tree; the rind is smoother, and the wood less knotty, than either the Orange or Lemon, and will take either sort full as well as its own kind, which is what none of the other sorts will do: and these stocks, if rightly managed, will be very strong the second year after sowing, capable to receive any buds, and will have strength to force them out vigorously; whereas it often happens, when these buds are inoculated into weak stocks, they frequently die, or remain till the second year before they put out; and those that shoot the next spring after budding, are oftentimes so weak as hardly to be fit to remain, being incapable to make a straight handsome stem, which is the great beauty of these trees.

CITRUL. See Pepo.

CLARY. See Sclarea.

CLAYTONIA. *Gron. Flor. Virg. Lin. Gen. Pl.* 253.

The Characters are,

The flower hath five oval petals which are indented at the top, and five recurved stamina, which are shorter than the petals. In the center is situated an oval germen, which afterward becomes a roundish capsule having three cells, opening with three elastic valves, and filled with round seeds.

We have but one sort of this genus in the English gardens, viz.

CLAYTONIA foliis linearibus. *Lin. Sp. Pl.* Claytonia with very narrow leaves.

This plant grows naturally in Virginia. It hath a small tuberous root, which sends out low slender stalks in the spring, about three inches high, which have two or three succulent narrow leaves about two inches long, of a deep green colour; at the top of the stalk are four or five flowers produced, standing in a loose bunch, composed of five

white petals which spread open, spotted with red on their inside; after these fall away, the germen becomes a roundish capsule divided into three cells, which are filled with roundish seeds.

It is propagated by seeds, and also from offsets sent out from the roots: the seeds should be sown on a border of light earth, soon after they are ripe; for if they are kept out of the ground till spring, the plants will not come up till the next year; whereas those which are sown early in the autumn, will grow the following spring, so that a whole year is gained. When the plants come up, they will require no other care but to keep them clean from weeds; and in the autumn, if some old tanners bark is spread over the surface of the ground, it will secure the roots from being injured by frost; which, if it should prove very severe, might be the case with young plants, but after the first winter they will not require protection.

The best time to transplant the roots is about Michaelmas, when they are inactive; but as they are small, so if great care is not taken in opening the ground, the roots may be buried and lost; for they are of a dark colour, so are not easily distinguished from the ground.

CLEMATIS. *Lin. Gen. Pl.* 626. Virgin's Bower.

The Characters are,

The flowers have each four loose oblong petals, with a great number of stamina; the summits adhere to their side. They have many compressed germina, which afterward become so many roundish compressed seeds, with the style sitting on their top.

The Species are,

1. **CLEMATIS foliis pinnatis, foliolis ovato-lanceolatis, integerrimis, caule erecto.** *Hort. Cliff.* 225. Upright white Climber.

2. **CLEMATIS foliis simplicibus, ovato-lanceolatis.** *Hort. Cliff.* 225. Upright blue Climber.

3. **CLEMATIS foliis pinnatis, foliolis cordatis, scandentibus.** *Hort. Cliff.* 225. Climber with broad entire leaves, commonly called Viorna, or Traveller's Joy.

4. **CLEMATIS foliis ternatis, foliolis cordatis, acutis, dentatis, scandentibus.** Broad-leaved Canada Climber, having three leaves.

5. **CLEMATIS foliis inferioribus, pinnatis, laciniatis, summis simplicibus, integerrimis, lanceolatis.** *Hort. Cliff.* 225. Creeping Climber.

6. **CLEMATIS cirrhis scandens.** *Hort. Cliff.* 226. Clematis with climbing tendrils.

7. **CLEMATIS foliis compositis decompositisque, foliolis ovatis, integerrimis.** *Hort. Cliff.* 225. Single blue Virgin's Bower.

8. **CLEMATIS foliis ternatis, ternatisque, foliolis ovatis, acutis serratis, scandentibus.** Clematis with trifoliate leaves, which have three oval lobes, sharply sawed, and climbing.

9. **CLEMATIS foliis compositis decompositisque, foliolis quibusdam trifidis.** *Flor. Virg.* 62. Creeping purple Climber, with coriaceous petals to the flower.

10. **CLEMATIS foliis compositis, foliolis incis, angulatis, lobatis, cuneiformibus.** *Lin. Sp. Plant.* 543. Eastern Climber with a Smallage leaf, and a reflexed greenish yellow flower.

11. **CLEMATIS foliis compositis & decompositis, foliolis ternatis, serratis.** *Gmel.* Climber with compound and decomposed leaves, whose small leaves are sawed and trifoliate.

12. **CLEMATIS foliis simplicibus, ternatisque: foliolis integris trilobisve.** *Lin. Sp. Plant.* 543. Climber with single and trifoliate leaves, whose small leaves are either entire, or have three lobes.

The first sort grows naturally in the south of France, in Italy, Austria, and several parts of Germany. This hath a perennial root and annual stalks, which grow upright, about five feet high, garnished with winged leaves standing opposite; these are composed of three or four pair of lobes, terminated by an odd one; the flowers are produced in large loose panicles, at the top of the stalks; these are composed

of four white petals, which spread open; and the middle is occupied by a great number of stamina, surrounding five or six germen, which afterward become so many compressed seeds, each having a long tail or beard sitting on the top.

The second sort grows naturally in *Hungary* and *Tartary*. This is perennial, sending up many slender upright stalks, from five to six feet high, garnished with single leaves at each joint, which stand opposite, on very short foot-stalks; they are near four inches long, and an inch and half broad in the middle, smooth, and entire, ending in a point: the flowers come out from the upper part of the stalks, standing upon very long naked foot stalks which nod down, each supporting a single blue flower, composed of four narrow thick petals which spread open, and many hairy stamina surrounding the germen in the center. After the flowers are past, the germen become so many compressed seeds, each having a tail or beard.

The third sort grows naturally in the hedges, in most parts of *England*. This hath a rough climbing stalk, sending out claspers, by which it fastens to the neighbouring bushes and trees, and sometimes rises more than twenty feet high, often covering all the trees and bushes of the hedge. This puts out many bunches of white flowers in *June*, which are succeeded by flat seeds joined in a head, each having a long twisted tail sitting on the top, covered with long white hairs; in autumn, when the seeds are near ripe, they appear like beards, from whence the country people call it Old Man's Beard. The branches of this being very tough and flexible, are often used for tying up faggots, from whence in some counties, it is called Bindwith.

The fourth sort grows naturally all over *North America*. This is in its first appearance very like the last sort, but the leaves are broader, and grow by threes on the same foot-stalk, whereas those of the former have five or seven lobes in each leaf: the flowers appear at the same time with the former.

The fifth sort hath a climbing stalk, like the third; the lower leaves of this are winged, and deeply cut on their edges, but the upper leaves are single, spear-shaped, and entire; the flowers of this sort are white. This grows naturally in the south of *France*, and in *Italy*.

The sixth sort grows naturally in *Spain* and *Portugal*. This hath a climbing stalk, which will rise to the height of ten or twelve feet, sending out branches from every joint, whereby it becomes a very thick bushy plant; the leaves are sometimes single, at other times double, and frequently trifoliate, being indented on their edges. These keep their verdure all the year; opposite to the leaves come out claspers, which fasten themselves to the neighbouring shrubs, by which the branches are supported, otherwise they would fall to the ground. The flowers are produced from the side of the branches; these are large, of an herbaceous colour, and appear always about the end of *December*, or beginning of *January*.

The seventh sort is cultivated in the nursery gardens for sale, and is known by the title of Virgin's Bower. There are four varieties of it which are preserved in the gardens of the curious, and have been by some treated as so many distinct species; but as their only differences consist either in the colour of their flowers, or the multiplicity of their petals, so they are now only esteemed as feminal variations; but as they are distinguished by the nursery gardeners, so I shall just mention them.

1. Single blue Virgin's Bower.
2. Single purple Virgin's Bower.
3. Single red Virgin's Bower.
4. Double purple Virgin's Bower.

The stalks of these plants are very slender and weak, having many joints from whence come out side branches, which

are again divided into smaller: if these are supported, they will rise to the height of ten or twelve feet, and are garnished with compound winged leaves placed opposite. These branch out into many divisions, each of which hath a slender foot-stalk, with three small leaves which are oval and entire; from the same joint, generally four foot-stalks arise, two on each side; the two lower have three of these divisions, so that they are each composed of nine small leaves; but the two upper have only two opposite leaves on each, and between these arise three slender foot-stalks, each supporting one flower. The flowers have each four petals, which are narrow at their base, but are broad at the top and rounded: in one they are of a dark worn-out purple, in another blue, and the third of a bright purple or red colour. The double sort, which is common in the *English* gardens, is of the worn-out purple colour. The double flowers have no stamina or germen, but in lieu of them, there is a multiplicity of petals, which are narrow, and turn inward at the top.

The eighth sort grows naturally on the *Alps*, and other mountains in *Italy*. This hath a slender climbing stalk, which rises three or four feet high, supporting itself by fastening to the neighbouring plants or shrubs. The leaves of this are composed of nine lobes or small leaves, three standing upon each foot-stalk. The flowers come out at the joints of the stalk in the same manner as the common Traveller's Joy, which are white, so make no great appearance.

The ninth sort grows naturally in *Virginia* and *Carolina*. This hath many slender stalks, garnished with compound winged leaves at each joint; these are generally composed of nine leaves, standing by threes, like those of the eighth sort, but the small leaves of this are nearly of a heart-shape. The flowers of this stand upon short foot-stalks, which come out from the wings of the leaves, one on each side the stalk. They are composed of four thick petals, which are purple on their outside, and blue within.

The tenth sort grows in the *Levant*. This hath weak climbing stalks, which fasten themselves by their claspers, to any plants or shrubs which stand near them, and thereby rise to the height of seven or eight feet; these are garnished with compound winged leaves, consisting of nine small leaves (or lobes) which are angular, and sharp pointed. The flowers come out from the wings of the leaves, which are of a yellowish green, and the petals are reflexed backward.

The eleventh sort grows naturally in *Tartary*. This plant hath weak climbing stalks which require support, they grow from four to eight feet high; the joints are far asunder, at each of these come two compound winged leaves, whose small leaves are placed by threes; these are deeply sawed on their edges and terminate in sharp points. The flowers come out from the wings of the leaves single, standing upon long naked foot-stalks, and are composed of four narrow spear-shaped petals, which spread open in form of a cross; they are of a yellowish white colour. After these are past, the germen become so many compressed seeds, each having a bearded tail.

The twelfth sort grows naturally in *Carolina*. This hath weak stalks which rise near four feet high, and by their claspers fasten themselves to the neighbouring plants, whereby they are supported. The leaves come out opposite at the joints: these are sometimes single, at others trifoliate, and some of the leaves are divided into three lobes. The flowers come out singly from the side of the branches upon short foot-stalks, with one or two pair of leaves below the flower, which are oblong, and sharp pointed. The flowers have four thick petals, like those of the ninth sort; of a purple colour, and their inner surface is curled, with many longitudinal furrows.

The two first sorts have perennial roots, which multiply pretty fast, but their stalks die down every autumn, and new ones arise in the spring, in which particular they differ from the other species, therefore require different management.

They are propagated either by seeds, or parting of their roots; but the former being a tedious method, the latter is generally practised. The best season for parting these roots is in *October*, just before their branches decay.

They will grow almost in any soil or situation; the roots may be cut through their crowns with a sharp knife, observing to preserve to every offset some good buds or eyes; and then it matters not how small you divide them, for their roots increase very fast; but if you part them very small, you should let them remain three or four years before they are again removed, that their flowers may be strong, and the roots multiplied in eyes.

The plants are extreme hardy, enduring the cold of our severest winters in the open air, and are very proper ornaments for large gardens, either to be planted in large borders, or intermixed with other hardy flower roots in quarters of flowering shrubs. They begin to flower about the beginning of *June*, and often continue to produce fresh flowers until *September*.

The third sort is found wild in most parts of *England*, growing upon the sides of banks, under hedges, and extends its trailing branches over the trees and shrubs that are near it. This plant in the autumn is generally covered with seeds, which are collected into little heads, each of which having, as it were, a rough plume fastened to it, hath occasioned the country people to give it the name of Old Man's Beard. It is titled by *Lobel* and *Gerard*, *Viorna*; and by *Dodonæus*, *Vitis alba*: in *English* it is commonly called Travellers Joy.

The fourth and fifth sorts have no more beauty than the third, so are seldom preserved in gardens, unless for the sake of variety. They are both as hardy as the common sort, and may be propagated either by seeds or laying down their branches.

The sixth sort retains its leaves all the year, which renders it valuable.

This sort doth not produce seeds in *England*, so it is propagated by layers, and also from cuttings. If they are propagated by layers, the shoots of the same year only should be chosen for this purpose, for the older branches do not put out roots in less than two years, whereas the tender shoots will make good roots in one: these must be pegged down into the ground in *October*, in the same manner as is usually practised for other layers, to prevent their rising. If the shoots have two inches of earth over them, it will be better than a greater depth. These layers will have strong roots by the following autumn, when they may be taken from the old plant, and transplanted where they are designed to remain.

All the varieties of Virgin's Bower, are easily propagated by laying down their branches; for although the single flowers do sometimes produce seeds in *England*, yet as these seeds, when sown, remain a whole year in the ground before they vegetate, so the other being the more expeditious method of increasing these plants, is generally practised: but in order to succeed, these layers should be put down at a different season from the former sort; for when they are layed in the autumn, their shoots are become tough, so do rarely put out roots under two years; and after lying so long in the ground, not one in three of them will have made good roots, so that many have supposed these plants were difficult to propagate; but since they have altered the season of doing it, they have found these layers have succeeded as well as those of other plants.

The best time for laying down of the branches is in *July*, soon after they have made their first shoots, for it is the young branches of the same year, which do freely take root; but as these are very tender, and apt to break, so there should be great care taken in the operation: therefore those branches from which these shoots are produced, should be first brought down to the ground, and fastened to prevent their rising; then the young shoots should be laid into the earth, with their tops raised upright, three or four inches above ground, and after the layers are placed down, if the surface of the ground be covered with Moss, rotten tanners bark, or other mulch, it will prevent the ground from drying, so that the layers will not require watering above three or four times, which should not be at less than five or six days interval; for when these layers have too much wet, the tender shoots frequently rot, or when the young fibres are newly put out, they are so tender, as to perish by having much wet: therefore where the method here directed is practised, the layers will more certainly take root, than by any other yet practised.

As these plants have all of them climbing branches, so they should be always planted where they may be supported, otherwise the branches will fall to the ground and appear unsightly; so that unless they are properly disposed, instead of being ornaments to a garden, they will become the reverse. Where there are arbours or seats with trellis work round them, these plants are very proper to train up against it; or where any walls or other fences require to be covered from the sight, these plants are very proper for the purpose; but they are by no means proper for open borders, nor do they answer the expectation when they are intermixed with shrubs; for unless their branches have room to extend, they will not be productive of many flowers.

The sort with double flowers is the most beautiful, so that should be preferred to those with single flowers, of which a few only should be planted for variety. They are all equally hardy, so are seldom injured by frost, excepting in very severe winters, when sometimes the very tender shoots are killed; but if these are cut off in the spring, the stems will put out new shoots.

The twelfth sort is also a very hardy plant, with climbing branches, so may be disposed in the same manner as the other. It is also propagated by layers, which will succeed, if performed at the same time, and in the same manner as is directed for the former.

CLEOME. *Lin. Gen. Plant.* 740.

The Characters are,

The flower hath four petals which are inclined upward, the lower being less than the other; in the bottom there are three mellous glands, which are separated by the empalement. It hath six or more incurved stamina fixed to their side: and a single style supporting an oblong germen, which afterward becomes a long cylindrical pod, having one cell opening with two valves, and filled with roundish seeds.

The Species are,

1. CLEOME *floribus gynandris, foliis digitatis.* *Hort. Cliff.* 341. Smooth five-leaved smaller Indian Bastard Mustard, with a flesh-coloured flower.
2. CLEOME *floribus hexandris, foliis ternatis; foliolis lanceolatis.* *Lin. Sp. Pl.* 672. Cleome with flowers having six stamina, trifoliate leaves, and spear-shaped lobes.
3. CLEOME *floribus hexandris, foliis ternatis, foliolis linearilanceolatis, siliquis bisvalvibus.* Cleome with flowers having six stamina, trifoliate leaves, narrow spear-shaped lobes, and pods having two valves.
4. CLEOME *floribus dodecandris, foliis quinatis ternatisque.* *Flor. Zeyl.* 241. Cleome with flowers having twelve stamina, and trifoliate and quinquefoliate leaves.

5. *CLEOME floribus hexandris, foliis ternatis, foliolo intermedio majori.* Cleome with flowers having six stamina, and trifoliate leaves, whose middle lobe is the largest.

6. *CLEOME floribus hexandris, foliis septenis, caule spinoso, siliquis pendulis.* Cleome with flowers having six stamina, leaves with seven lobes, a prickly stalk, and hanging pods.

7. *CLEOME floribus hexandris, foliis quinatis ternatisque, caule spinoso.* Cleome with flowers having six stamina, leaves composed of five and three lobes, and a prickly stalk.

8. *CLEOME floribus hexandris, foliis simplicibus, ovato lanceolatis.* *Flor. Zeyl.* 243. Cleome with six stamina to the flowers, and single leaves, which are ovally spear-shaped.

The first sort grows naturally in *Asia, Africa, and America.* It rises with an herbaceous stalk about a foot high, garnished with smooth leaves, composed of five small leaves or lobes, joining at their base to one center, and spread out like the fingers of a hand. The leaves on the lower part of the stalk stand upon long foot-stalks, which are gradually shortened to the top of the stalk, where they almost join it: the flowers terminate the stalks in loose spikes. These have four petals of a flesh colour, which stand erect, spreading from each other, and below these are placed the stamina and style which coalesce at the bottom, and are stretched out beyond the petals. After the flower is past, the germen which sits upon the style, becomes a taper pod, about two inches long, filled with round seeds.

The second sort grows naturally in the *Levant.* This rises with an upright stalk about a foot high, garnished with leaves composed of three spear-shaped lobes, standing upon short foot-stalks; the flowers come out singly from the side of the stalks, and have four red petals, which stand in the same form as those of the former sort: these are succeeded by slender pods two inches long, which swell in every division, where each seed is lodged, so as to appear like joints, as those do of the Bird's-foot Trefoil; when the seeds are ripe, the whole plant decays. If the seeds of this sort are permitted to scatter, the plants will come up without care, and require only to be thinned and kept clean from weeds, for they will not bear transplanting.

The third sort grows naturally in *Portugal and Spain.* This rises with an herbaceous stalk about a foot high, sending out a few short side branches, garnished with leaves composed of three narrow lobes, standing upon short foot-stalks. The flowers come out singly from the side of the stalks, of a deep red colour, and are succeeded by thick taper pods, filled with round seeds. This is an annual plant, which will thrive in the open air, and requires the same treatment as the former.

The fourth sort grows naturally in the island of *Ceylon.* This rises a foot and an half high, sending out several side branches, garnished with leaves, some of which have five, and others three roundish lobes, standing upon short hairy foot-stalks. The flowers come out singly at the foot-stalks of the leaves, they are of a pale yellow, and are succeeded by taper pods between two and three inches long, ending in a point, which are full of round seeds. The whole plant sweats out a viscous clammy juice.

The fifth sort is an annual plant which rises two feet high, sending out many side branches, garnished with leaves, having one large spear-shaped lobe in the middle, and two very small ones on the side; these sit close to the branches. The flowers come out singly from the side of the branches, upon long foot-stalks: they have four large flesh-coloured petals, and six long stamina, which stand out beyond the petals; when the flowers fade, the germen which sits upon the style becomes a taper pod four inches long, filled with round seeds.

The sixth sort grows naturally in *Egypt and America.* This rises with a strong thick herbaceous stalk two feet and

an half high, dividing into many branches, which are garnished with leaves composed of seven long spear-shaped lobes, joining in a center at their base, where they sit upon a long slender foot-stalk: just below the foot-stalk, comes out one or two short thick yellow spines which are very sharp. The flowers come out singly from the side of the branches, forming a long loose spike at their extremities; this spike hath single broad leaves, which half surround the stalks at their base, from the bosom of which, come out the foot-stalks of the flowers, which are two inches long, each sustaining a large flesh-coloured flower, whose style and stamina are extended two inches beyond the petals. After the flower is past, the germen which sits upon the style, becomes a thick taper pod five inches long, which hangs downward, and is filled with round seeds.

The seventh sort grows naturally in the *Havannah.* This is also an annual plant, which rises near two feet high, branching out on every side: the lower leaves are composed of five oblong lobes standing upon long foot-stalks, but those on the stalks and branches have but three lobes, and have short foot-stalks: the main stalk and also the branches, are terminated by loose spikes of purple flowers, each sitting upon a slender foot-stalk, at the base of which is placed a single oval leaf. The stalks are armed with slender stiff spines, which are situated just under the foot-stalks of the leaves; when the flowers fade, the germen becomes a taper pod two inches long, filled with round seeds.

The eighth sort grows naturally in *Ceylon;* this is an annual plant which rises with an herbaceous stalk a foot high, garnished with long narrow single leaves, standing alternately on the stalks; from the wings of the leaves come out the foot-stalks of the flower, each sustaining a single yellow flower, which is succeeded by a very slender taper pod. All these plants except the second and third sorts, are natives of very warm countries, so will not thrive in *England,* without artificial heat; therefore their seeds must be sown upon a good hot-bed in the spring, and when the plants are fit to remove, they should be planted in separate small pots, and plunged into a fresh hot-bed, observing to shade them until they have taken root; after which, they should have plenty of air in warm weather. The plants when they are too tall to remain longer in the hot-bed, should be removed into an airy glass case, where they may be screened from cold and wet, but in warm weather may enjoy the free air. With this management the plants will flower soon after, and perfect their seeds in autumn. The second and third sorts may be sown in the open borders of the garden, where they are designed to remain, for they do not require any artificial warmth.

CLETHRA. Gron. Fl. Virg. 43.

The Characters are,

The flower hath five oblong petals; it hath ten stamina which are as long as the petals. In the center is situated a roundish germen, which afterward becomes a roundish capsule inclosed by the empalement, having three cells, which are full of angular seeds.

We know but one Species of this genus at present, viz.

CLETHRA. Gron. Fl. Virg. 43. There is no English title to this plant.

This shrub is a native of *Virginia and Carolina,* where it grows in moist places, and near the sides of rivulets, rising to the height of eight or ten feet. The leaves are in shape like those of the Alder tree, but are longer; these are placed alternately upon the branches: the flowers are produced at the extremity of the branches, in close spikes: they are composed of five leaves, are white, and have ten stamina in each, which are nearly of the same length with the petals.

This is hardy enough to bear the open air of *England,* and is one of the most beautiful shrubs at the season of its flowering; which is very little later than in its native country, being.

being commonly in flower here by the beginning of *July*; and if the season is not very hot, there will be part of the spikes in beauty till the beginning of *September*; and as most of the branches are terminated with these spikes of flowers, so when the shrubs are strong, they make a fine appearance at that season.

This shrub will thrive best in moist land, and requires a sheltered situation, where it may be defended from strong winds, which frequently break off the branches, where they are too much exposed to its violence. It is propagated by layers, but they are generally two years before they get root. They may also be propagated by suckers, which are sent out from their roots; if these are carefully taken off with fibres in the autumn, and planted into a nursery bed, they will be strong enough in two years to transplant where they are to remain.

CLIFFORTIA. *Lin. Gen. Plant.* 1004.

The Characters are,

It hath male and female flowers in different plants: the male flowers have a spreading empalement, composed of three small oval concave leaves, but no petals, with a great number of hairy stamina. The female flowers have a permanent empalement composed of three leaves, sitting upon the germen; these have no petals, but the oblong germen which is situated below the empalement, supports two long slender feathered styles; the germen afterward becomes an oblong taper capsule, with two cells crowned by the empalement, including one narrow taper seed.

The Species are,

1. CLIFFORTIA *foliis subcordatis, dentatis.* *Lin. Sp. Plant.* 1308. Cliffortia with heart-shaped, indented leaves.

2. CLIFFORTIA *foliis ternatis, intermedio tridentato.* *Prod. Leyd.* 253. Three-leaved Cliffortia, whose middle leaf is cut in three parts.

3. CLIFFORTIA *foliis lanceolatis, integerrimis.* *Hort. Cliff.* 463. Cliffortia with spear-shaped leaves which are entire.

The first sort grows naturally at the *Cape of Good Hope*. It rises with a weak shrubby stalk four or five feet high, sending out many diffused branches, which spread on every side, requiring some support: these are garnished with leaves, which are heart-shaped at their base, but are broad at their ends, where they are sharply indented. They are very stiff, of a grayish colour, and closely embrace the stalks with their base, and are placed alternate on the branches; and from the bosom of these arise a single flower, sitting close to the branch, having no foot-stalk. Before the empalement is spread open, it forms a bud, in shape and size of those of the *Caper*; this empalement is composed of three green leaves, which afterwards spread open, and then the numerous stamina appear standing erect.

This plant is easily propagated by cuttings, which may be planted in any of the summer months, which will soon take root, provided they are screened from the sun, and duly watered; when they have taken root, they may be each transplanted into a separate small pot, and placed in the shade until they have taken fresh root, after which they may be placed with other of the hardy kinds of exotick plants, in a sheltered situation till *October*, when they should be removed into the green-house, or placed under a common hot-bed frame, where they may be screened from the hard frost, but enjoy the free air at all times when the weather is mild. This plant has endured the cold of our ordinary winters, planted near a south-west wall without covering; but in severe winters they are always destroyed.

The second sort is a native of the same country as the first, this hath very slender ligneous stalks, which must be supported, otherwise they will fall to the ground. The branches are garnished with trifoliate leaves standing close to them; the middle lobes of these are much larger than the two side, and are indented in three parts. The

flowers of this come out from the bosom of the leaves, having very short foot-stalks, and are shaped like those of the first, but are smaller. This sort requires the same management as the first, and is equally hardy, but must not be over watered in winter. The leaves of this sort continue green all the year.

The third sort rises with a weak shrubby stalk about four feet high, sending out lateral branches, which are covered with a whitish bark, and garnished with leaves, placed in clusters without order; these are stiff, of the consistence and colour of the *Butchers Broom*, but are narrower, and run out to a longer point. Between these clusters of leaves the flowers come out in loose bunches; these have a great number of yellowish stamina, included in a three-leaved empalement.

This plant is tenderer than either of the former sorts, so should be placed in a good warm green-house in winter, and during that season, they must have but little water. In the summer they may be exposed to the open air in a sheltered situation, but they should not remain too late abroad in the autumn; for if there should be much rain at that season, it would endanger these plants, if they are exposed to it.

CLINOPodium. *Lin. Gen. Pl.* 644. Field Basil.

The Characters are,

The flower is of the lip kind, with a short tube enlarging to the mouth; the upper lip is erect, and indented at the top; the under lip is trifid, the middle segment being broad and indented. It hath four stamina under the upper lip, two of which are shorter than the other. In the center is situated the quadripartite germen, which afterward become four oval seeds skut up in the empalement.

The Species are,

1. CLINOPodium *capitulis subrotundis, hispidis, bracteis setaceis.* *Lin. Sp. Plant.* 587. Field Basil with roundish prickly heads, and bristly bractea.

2. CLINOPodium *foliis subtus tomentosis, verticillis explanatis, bracteis lanceolatis.* *Lin. Sp. Pl.* 588. Field Basil with leaves which are woolly on the under side, broad plain whorls, and spear-shaped bractea.

3. CLINOPodium *foliis rugosis, capitulis axillaribus, pedunculatis, explanatis, radiatis.* *Lin. Sp. Plant.* 588. Field Basil with rough leaves, plain heads growing on the sides of the stalks, which have foot-stalks, and are radiated.

4. CLINOPodium *humile ramosum, foliis rugosioribus, capitulis explanatis.* Low branching Field Basil with rougher leaves, and plain heads.

5. CLINOPodium *caule erecto, non ramoso, foliis subtus villosis, verticillis paucioribus, bracteis calyce longioribus.* Field Basil with an upright, unbranching stalk, leaves hairy on their under side, fewer whorls, and bractea longer than the empalement.

6. CLINOPodium *foliis ovatis rugosis, verticillis distantibus, i. e.* Field Basil with oval rough leaves, and the whorls of flowers standing at a great distance.

The first sort grows naturally by the side of hedges, and in thickets, in most parts of *England*; this hath a perennial fibrous root, which sends up several stiff square stalks, a foot and an half high, which send out a few lateral branches toward the top, garnished with oval hairy leaves, placed by pairs; at the top of the stalks the flowers come out in round whorls, or heads; one of these terminate the stalk, and there is generally another which surrounds the stalk at the joint immediately below it. The flowers are sometimes purple, at others white. The whorls (or heads) grow very close, and each foot-stalk sustains several flowers. At the base of the empalement stand two bristly spines, which *Linnaeus* terms the bractea; these stand almost horizontal under the empalement. The flower is of the labiated, or lip kind. The upper lip is broad and trifid, but the under is cut into two narrow segments; each flower is suc-

ceeded by four naked seeds, sitting at the bottom of the empalement.

The second sort grows naturally in *Pensylvania* and *Carolina*; this hath a perennial root, which sends up many square stalks about two feet high, which put out a few short side branches toward the upper part, garnished with oblong oval leaves, about the size of those of Water Mint, standing by pairs close to the stalk; they are hoary, and soft to the touch, and have a strong odour, between that of Marjoram and Basil. The flowers grow in flat smooth whorls round the stalks; each stalk hath generally three of these whorls, the upper which terminates the stalk being smaller, the two other increasing, so that the lower is the greatest. The flowers are of a pale purple colour, and shaped like those of the first sort, but the stamina of this stands out beyond the petal, and the bractea at the base of the empalement are large, spear-shaped, and indented on their sides.

The third sort grows naturally in *Carolina*. This hath a perennial root, sending up several square stalks, which are closely covered with brownish hairs; these rise between two and three feet high; they are garnished with leaves, which are very unequal in their size, those at the bottom, and also toward the top being above three inches long, and one inch and a quarter broad, whereas those in other parts of the stalk are not half so large; they are rough on their upper side, hairy below, sawed on their edges, and stand opposite by pairs: all the lower part of the stalk, but immediately below the foot-stalks of the flower heads, there are three large leaves standing round the stalks; between these arise two slender hairy foot-stalks, about three inches long, one on each side the stalk; these sustain small heads of flowers, shaped like those of the Scabious; they are white, shaped like those of the other but smaller; the bractea immediately under the empalement, spread out like rays.

The fourth sort grows also in *Carolina*. This hath some appearance of our common sort, but the stalks do not grow more than half so high, and divide into many long side branches; the leaves are smaller and rougher, and the whorls of flowers are produced half the length of the branches, whereas the common sort hath rarely more than two; the bractea at the base of the empalement are also much longer.

The fifth sort grows in *Carolina*. This hath a perennial root, sending up strait hairy stalks, which are almost round; the joints of these are four or five inches asunder, at each of these come out two oblong leaves, hairy on their under side, standing upon short foot-stalks; at the bottom of these come out on each side, a slender branch, half an inch long, having two or four small leaves, shaped like the other. The flowers are produced in small whorls, standing thinly; these are white, and the bractea are longer than the empalement.

The sixth sort is a native of *Egypt*. It hath a perennial root, but annual stalks, which grow a foot and an half high, garnished with oval leaves, having many transverse deep furrows, and are of a dark green colour, placed opposite, at about five or six inches asunder. There are commonly two or four side branches from the main stems, produced toward the bottom; and the whorls of flowers are produced at every joint, toward the upper part of the stalks; these are pretty large and hairy. The flowers are somewhat larger than those of the common Field Basil, and are of a deeper colour, stretching a little more out of the empalement. The leaves of this have at first sight much the same appearance, but when they are observed with attention, the difference is soon perceived between the two sorts: but the greatest difference is in the leaves and whorls of flowers being placed at a greater distance, and the stalks

growing sparsedly in this species; nor do the plants continue so long as those of the common sort.

This plant approaches near to the *Clinopodium Orientale Origani folio, flore minimo*. Tour. Corol. 12. But by comparing this with a specimen of that sort from the *Paris* garden, I find the leaves of that are smoother, and placed much nearer together on the stalks than those of this sort, and the flowers are smaller.

These plants may be propagated by seeds, and also by parting of their roots; the latter is generally practised in *England*. The best time to transplant and part their roots is in autumn, that they may take root before winter; if these are planted in a dry soil, they are all of them, except the third sort, hardy enough to thrive in the open air in *England*, and require no other care but to keep them clean from weeds, and every other year they may be transplanted and parted.

The third sort must be planted in pots, and in winter sheltered under a frame, where the plants may enjoy the free air in mild weather, but screened from frost, otherwise it will not live in this country.

CLITORIA. *Lin. Gen. Plant.* 796.

The Characters are,

The flower is of the butterfly kind, having a large spreading standard, which is erect; the two wings are oblong, and shorter than the standard. The keel is shorter than the wings, and is hooked. It hath ten stamina, nine of which are joined, and one stands separate. In the center is situated an oblong germen, which afterward becomes a long narrow compressed pod, with one cell, opening with two valves, inclosing several kidney-shaped seeds.

The Species are,

1. CLITORIA *foliis pinnatis*. Hort. Cliff. 360. Clitoria with winged leaves.

2. CLITORIA *foliis ternatis, calycibus campanulatis solitariis*. Hort. Upsal. 215. Clitoria with trifoliate leaves, and a single flower with a bell-shaped empalement.

3. CLITORIA *foliis ternatis, calycibus campanulatis geminis*. Flor. Virg. 83. Three-leaved Clitoria with two flowers joined, whose empalements are bell-shaped.

4. CLITORIA *foliis ternatis, calycibus cylindricis*. *Lin. Sp. Plant.* 753. Clitoria with trifoliate leaves, and cylindrical empalements to the flowers.

The first sort grows naturally in *India*. There is a variety of this with white flowers, and another with large blue flowers, which make a fine appearance.

This rises with a twining herbaceous stalk, to the height of four or five feet, in the same manner as the Kidney-bean, and requires the like support, for in the places where it grows naturally, it twists itself about the neighbouring plants; the stalks are garnished with winged leaves, composed of two or three pair of lobes, terminated by an odd one; these are of a beautiful green, and are placed alternate on the stalks; from the appendages of the leaves, come out the foot-stalks of the flowers; each of these is encompassed by two very fine leaves about the middle, where they are bent, sustaining a very large gaping beautiful flower, whose bottom part seems as if growing to the top.

The second sort grows naturally in the *Brazils*, from whence the seeds were brought to *Europe*; this hath a twining stalk like the former, which rises five or six feet high, and is garnished at each joint with one trifoliate leaf, standing upon a long foot-stalk. The flowers come out singly from the foot-stalk of the leaves, standing upon pretty long foot-stalks, which are encompassed about the middle with two small oval leaves; the flowers are very large, the standard being much broader than that of the first sort, and the two wings are larger; the flowers are of a fine blue colour, so make a fine appearance.

There is one with a double flower of this, which I raised in the *Chelsea* garden some years past, from seeds sent me from *India*, but the plants did not produce seeds here, and being annual, the sort was lost. The flowers of this were very beautiful.

The seeds of the third sort were sent me from the *Babama* islands; this sends out from the root two or three slender twining stalks, which rise to the height of six or seven feet, and are garnished at each joint with one trifoliate leaf, whose lobes are oblong, and pointed. At the opposite side of the stalk, the foot-stalk of the flower arises, which is little more than an inch long, naked, and sustains a single flower, which is of a purple colour within, but of a greenish white on the outside, not half so large as either of the former. These flowers are each succeeded by long, slender, compressed pods, ending in a point, which contain one row of roundish kidney-shaped seeds.

The seeds of the fourth sort were sent me from *Carolina*, where the plants grow naturally. This rises with a twining weak stalk about five feet high, and is garnished with trifoliate leaves like the former, whose lobes are narrower, and of a grayish colour on their under side; the flowers come out by pairs on the foot-stalks, and their empalements are cylindrical: the flowers are small, and of a pale blue colour within, but of a dirty white on the outside.

All these sorts are annual with us in *England*, so that unless the seeds ripen, the species are lost; and as the two sorts with double flowers, have not formed any pods in this country, so far as I have been able to learn, therefore the seeds of these must be procured from the countries where they naturally grow.

The seeds of these plants must be sown upon a good hot-bed early in the spring, and when the plants are two inches high, they should be carefully taken up, and each planted in a small pot, and plunged into a hot-bed of tanners bark, observing to shade them till they have taken fresh root. After they are well rooted in the pots, they must have air every day in proportion to the warmth of the season, to prevent their drawing up weak; their waterings should be repeated two or three times a week, but they should not have too much at each time. As these plants have climbing stalks, so they will soon grow too tall to remain under common frames, therefore they must then be removed into the stove, and plunged into the bark bed, and afterward they must be treated in the same manner as other plants from the same countries.

CLUSIA. *Lin. Gen. Plant.* 577. *Plum. Nov. Gen.* 20. tab. 20. The Balsam tree.

The Characters are,

The flower hath five large roundish concave spreading petals. In the bottom is situated a globular nectarium, including the germen, which is pervious at the top. It hath a great number of single stamina; the oblong oval germen is terminated by a plain star-like stigma with six obtuse indentures, which afterward becomes an oval capsule with six furrows and six cells, opening with six valves, which spread in form of a star, including many angular seeds fixed to a column, surrounded with pulp.

The Species are,

1. CLUSIA foliis crassis subrotundis nitidis, caule arboreo. Clusia with thick shining roundish leaves, and a tree-like stalk; commonly called Balsam tree in *America*.

2. CLUSIA foliis venosis. *Lin. Sp. Pl.* 510. Clusia with veined leaves.

There are two or three varieties of the first sort, which differ in the size and colour of their flowers and fruit; one hath a white flower and scarlet fruit, another hath a Rose flower and a greenish fruit, and the third hath a yellow fruit: but these are only supposed to be feminal variations.

The first sort is pretty common in the *British* islands of

America, where the trees grow to the height of twenty feet, and shoot out many branches on every side, which are furnished with thick round succulent leaves placed opposite. The flowers are produced at the ends of the branches, each having a thick succulent cover. After the flowers are past, they are succeeded by oval fruit. From every part of these trees there exudes a sort of turpentine, which is called in the *West-Indies* hog-gum; because they say, that, when any of the wild hogs are wounded they repair to these trees, and rub their wounded parts against the stems of these trees, till they have anointed themselves with this turpentine, which heals their wounds.

As these plants are tender, so they must be constantly kept in the stove, otherwise they will not live through the winter in *England*; they must also be watered very sparingly, especially in winter; for they naturally grow in those parts of the islands, where it seldom rains, therefore they cannot bear much moisture.

They may be propagated by cuttings, which must be laid to dry when they are cut off from the plants for a fortnight or three weeks, that the wounded part may be healed over, otherwise they will rot: when the cuttings are planted, the pots should be plunged into a hot-bed of tanners bark, and now and then gently refreshed with water. The best time for planting these cuttings is in *July*, that they may be well rooted before the cold weather comes on in autumn. In winter these plants may be placed upon stands in the dry stove; but if in summer they are plunged into the tan bed, they will make great progress, and their leaves will be large, in which consists the great beauty of these plants.

The second sort was discovered by the late Dr. *Houfston* at *Campeachy*. This hath very large oval spear-shaped leaves ending in points, which are placed alternate on the branches, and have seven ribs, which go off from the midrib alternate; and also a great number of small veins running horizontally between these ribs. The borders of the leaves are sawed, and their under sides are of a shining brown colour. The branches are covered with a woolly down, and the flowers are produced in loose spikes at the end of the shoots; these are smaller than those of the former sort, and are of a Rose colour. This tree rises to the height of twenty feet; it is propagated by seeds. The plants are tender, so must be placed in the tan bed of the bark stove, otherwise they will not thrive in this country; and they must be treated in the same manner as is directed for other tender plants from the same countries.

CLUTIA. *Lin. Gen. Plant.* 1009.

The Characters are,

It is male and female in different plants. The male flowers have five heart-shaped petals which are shorter than the empalement, and spread open. They have five exterior nectariums, which are situated in a circle at the bottom of the petals; and five interior, which are situated within the other. They have five stamina situated in the middle of the style. The female flowers have petals like those of the male; these have five double exterior nectariums, but no interior; they have a roundish germen, which afterward becomes a globular capsule with six furrows and three cells, each containing a single seed.

The Species are,

1. CLUTIA foliis sessilibus lanceolatis. *Hort. Cliff.* 500. Clutia with spear-shaped leaves fitting close to the stalks.

2. CLUTIA foliis ovatis integerrimis, floribus lateralibus. *Lin. Sp. Plant.* 1042. Clutia with oval entire leaves, and flowers growing from the side of the branches.

3. CLUTIA foliis cordato lanceolatis. *Flor. Zeyl.* Clutia with heart-formed spear-shaped leaves.

4. CLUTIA foliis lanceolatis acutis integerrimis petiolatis. *Lin. Sp. Pl.* 1042. Clutia with entire spear-shaped pointed leaves, having foot-stalks.

The two first sorts are natives of *Africa*. The first sort with female flowers has been long an inhabitant of some curious gardens in *England*, but that with male flowers has been but few years here.

The second sort has also been some years in the *English* gardens, and was ranged in the genus of *Alaternoides*, but we have not the male of this sort in *England* at present.

The first sort rises with a shrubby stalk to the height of six or eight feet, putting out many side branches, garnished with small spear-shaped leaves, placed alternate, sitting close to the branches: they are of a grayish colour and entire. The flowers come out from the joints, at the sitting on of the leaves, toward the upper part of the branches: these are small and of a greenish white: they appear in *June*, *July*, and *August*, but being small make no great appearance.

The second sort rises about the same height with the first, but hath a stronger stem; the branches are garnished with oval leaves, which are much larger than those of the first sort, having foot-stalks which are an inch long; these are of a sea-green, and entire; the flowers are like those of the first sort in shape and colour, but those on the male plants are smaller, and grow closer together than those of the female, but both are sustained upon short foot-stalks; the seeds ripen in autumn.

These plants are easily propagated by cuttings during any of the summer months, when they will soon take root, and then may be each put into a separate small pot, and placed in a sheltered situation, where they may remain until the middle of *October*, or later, if the weather continues mild, when they should be removed into the green-house, and placed where they may have the free air in mild weather, for they only require to be protected from frost. In summer they must be placed abroad, in a sheltered situation, with other hardy exotick plants.

The third sort grows naturally in *India*, from whence the seeds were brought. This rises with an upright shrubby stalk, not more than three or four feet in *England*; but in the places where it grows naturally, it rises upward of twenty feet high, and sends out many branches at the top, so as to form a large spreading head: the branches are garnished with leaves, shaped like those of the black Poplar, which are of a lucid green, and are placed alternate, standing upon slender foot-stalks.

This plant will live through the winter in an airy glass case, without artificial heat, but in that situation they should have very little water in the winter; for the plants abound with a milky juice like the *Euphorbia*, so must at no season of the year have too much wet. This sort may be propagated by cuttings during the summer season; but the cuttings should be laid in a dry place for a few days, when they are taken from the old plants, that their wounded parts may dry and be healed over, before they are planted. These must be planted in small pots, and plunged into a moderate hot-bed of tanners bark; and if the season is very warm, the glasses should be shaded in the heat of the day; they must be very sparingly watered, for much wet will cause them to rot. When they have taken root, and begin to shoot, they must have a greater share of air, and by degrees inured to the open air, and each planted in a separate pot, and placed in the shade till they have gotten fresh root, after which they may be exposed gradually to the open air. In the summer they should have free air constantly in warm weather, but they must be screened from heavy rain, and in winter placed in an airy glass case, where they may enjoy the sun, and during that season have very little wet.

The fourth sort grows naturally in the *Bahama* islands, and also near the *Havannah*. This rises about twelve or fourteen feet high, with several shrubby stems, which divide into many branches, garnished with narrow pale green leaves, placed

alternate, standing upon pretty long foot-stalks; the flowers come out in long loose spikes from the side of the branches; these are white, with yellow summits, and are succeeded by small round capsules, having three cells, in each of which is lodged a single black seed. The bark of this tree, when burned, emits a fine perfume; and if infused in wine or water, gives either a fine aromattick bitter. This plant may be propagated in the same manner as the former, but requires a stove to preserve it through the winter, and is very impatient of moisture, so should have very little water.

CLYPEOLA. *Lin. Gen. Pl.* 723. Treacle Mustard.

The Characters are,

The flower hath four oblong entire petals, placed in form of a cross, and six stamina, two of which standing opposite are shorter than the other. In the center is situated a roundish compressed germen, which after-ward becomes an orbicular pod, which is compressed, erect, and indented at the top, with a longitudinal fissure, opening in two cells, containing round compressed seeds.

The Species are,

1. CLYPEOLA *siliculis unilocularibus monospermis*. *Hort. Cliff.* 329. Clypeola with pods having but one cell and a single seed.

2. CLYPEOLA *siliculis bilocularibus tetraspermis*. *Hort. Cliff.* 329. Clypeola with pods having two cells and four seeds.

3. CLYPEOLA *annua siliculis bilocularibus dispermis, calycibus persistentibus*. *Sauv. Monsp.* 71. Annual Clypeola with pods having two cells and two seeds, and a permanent empalement.

4. CLYPEOLA *perennis, siliculis bilocularibus ovatis dispermis*. *Sauv. Monsp.* 71. Perennial Clypeola with oval pods, having two cells and two seeds.

The first sort is a low annual plant, which seldom rises more than four inches high; the slender branches commonly lie prostrate on the ground; these are garnished with small leaves, narrow at their base, but are broader at their ends, where they are obtuse. The flowers are produced in short close spikes at the extremity of the branches, which are small, yellow, and composed of four leaves placed in form of a cross; these are succeeded by orbicular compressed seed vessels, each having one cell, containing a single seed.

The second sort rises with slender ligneous stalks, near six inches high; which grow erect, and are garnished with small, oblong, hairy leaves, placed alternate, standing close to the stalks. The flowers are produced in long spikes at the end of the branches, which are yellow, and shaped like those of the first sort, but larger; these are succeeded by roundish flat pods, having two cells, each containing two seeds.

The third sort hath several weak ligneous stalks, about four inches long, which are garnished with very narrow hoary leaves, and are terminated by short spikes of yellow flowers, which are smaller than those of the last sort; the pods are also much less, and have two cells, each containing a single seed.

The fourth sort is perennial; this branches out from the root into several slender branches, garnished with very narrow hoary leaves, sitting close to the branches. The flowers are produced in spikes at the end of the branches; these are small, white, and shaped like those of the other sorts, but the spikes terminate in a roundish bunch.

The three first sorts are low annual plants, which grow naturally in the south of *France*, in *Spain*, and *Italy*; they are all of a hoary white, both leaves and stalks, which is much lighter in the warm countries than in *England*; they are propagated by seeds, which should be sown where they are to remain, and will require no other culture, but to thin them, and keep them clean from weeds. The seeds may be sown either in the spring, or autumn; those which are

sown

sown in autumn will grow much larger, and flower earlier than those which are sown in the spring, and from them there will be a greater certainty of having ripe seeds.

The fourth sort is a perennial plant, so should be sown upon a warm border; this grows naturally on the borders of the sea, in the south of *France* and *Italy*, but when it is cultivated in a garden, if the soil is rich and moist, the plants generally grow luxuriant in summer, and are thereby too replete with moisture, so that they are frequently killed by the frost in winter; but when they grow on a poor dry gravelly soil, or on a wall, their stalks will be short, ligneous, and tough, so will endure the cold of this climate, and continue several years; this is propagated by seeds, which should be sown where the plants are designed to remain; or if any of them are removed, it should be done when the plants are young, for they do not bear transplanting well, when they are grown pretty large.

CNEORUM. *Lin. Gen. Pl.* 47. Widow-wail.

The Characters are,

The flower hath three narrow oblong petals, and three stamina, which are shorter than the petals. In the center is situated an obtuse three-cornered germen, which afterward becomes a globular dry berry, with three lobes, having three cells, each containing one round seed.

We have but one Species of this genus, viz.

CNEORUM. *Hort. Cliff.* 18. Widow-wail. This is the *Chamelæa tricoccus* of *Dodonæus* and *Cospar Baubin*.

It is an humble shrub, which seldom rises more than two feet and an half high in this country, but spreads out on every side with many lateral branches, so as to form a thick bush. The stems are almost as hard as those of the Box tree, and the wood is of a pale yellow colour under the bark. The branches are garnished with leaves, which are stiff, of an oval shape, about an inch and an half long, and a quarter of an inch broad, of a dark green colour, having a strong vein, or rib, through the middle. The flowers are produced single from the wings of the leaves, toward the extremity of the branches, which are of a pale yellow colour, composed of three petals, which spread open, and a round germen at the bottom, having a single style, which doth not rise above half the length of the stamina, which are three in number, standing erect, and are situated between the petals. After the flowers are fallen, the germen becomes a fruit, composed of three seeds joined together after the same manner as those of *Tithymalus*, or *Spurge*; these are first green, afterwards turn of a brown colour, and when ripe are black.

As this is a low ever-green shrub, so it may be very ornamental, if placed in the front of plantations of ever-green trees and shrubs; for as the branches grow pretty compact, and are well garnished with leaves, so it will hide the ground between the taller shrubs better than most other plants; and, being a durable shrub, will not want to be renewed; it rises better from scattered seeds, than if sown with care.

It is propagated by seeds, which should be sown in autumn soon after they are ripe, and then the plants will come up the following spring; whereas those which are not sown till the spring, will remain a year in the ground, and often miscarry; these seeds may be sown in a bed of common earth, covering them half an inch deep, and will require no other care but to keep the plants clear from weeds the following summer; and in the autumn following, the plants may be transplanted where they are to remain.

CNICUS. *Lin. Gen. Pl.* 833. Blessed Thistle.

The Characters are,

The empalement of the flower is scaly. The flower is composed of several hermaphrodite florets, which are uniform; these are funnel shaped, and cut at the top into five equal segments, having five short hairy stamina. In the center is situated a short

germen, crowned with down, which afterward becomes a single seed, crowned with down, and shut up in the empalement.

The Species are,

1. CNICUS caule diffuso, foliis dentato-sinuatis. *Hort. Cliff.* 395. Blessed Thistle with a diffused stalk, and leaves indented in sinuses; Hairy, or Blessed Thistle.

2. CNICUS caule erecto, foliis inferioribus laciniatis, superioribus integris concavis. *Hort. Cliff.* 394. Cnicus with an upright stalk, whose lower leaves are lacinated, the upper entire and concave.

3. CNICUS foliis amplexicaulibus, sinuato-pinnatis, spinosis, caule simplici, floribus sessilibus. *Lin. Sp. Pl.* 826. Cnicus with winged, sinuated, prickly leaves, embracing the stalk, which is single, and flowers sitting close on the top.

4. CNICUS foliis cordatis, petiolis crispis, spinosis, amplexicaulibus, floribus cernuis. *Hort. Upsal.* 251. Cnicus with heart-shaped leaves, having curled prickly foot-stalks, which embrace the stalks, and a nodding flower.

The first sort is the common *Carduus* which is used in medicine; this is an annual plant, which perishes soon after the seeds are ripe. It grows naturally in *Spain*, and the islands of the *Archipelago*, but is cultivated in gardens in *England* to supply the markets. This plant is so well known, as to require no description.

The seeds of this plant should be sown in autumn on a bed of common earth, and in the spring the plants should be transplanted, placing them in rows at two feet distant, and one foot asunder in the rows; if the season proves dry, it will be necessary to water the plants two or three times, till they have taken root, after which they will require no other culture but to keep them clean from weeds.

The best time to cut this plant for use, is when the flowers are fully blown, before the lower leaves decay; when it is cut, it should be spread in a dry shady place for three or four days, then tied up in bunches, and hung up in a dry room upon strings in rows, that the air may pass freely between them, which will prevent their growing mouldy, or rotting.

The second sort grows naturally in the northern parts of *Europe*. This hath a perennial root, which sends out many long jagged leaves spreading on every side near the ground, so as to form a thick bunch; these are jagged almost to the midrib, in form of a winged leaf. The stalks are striated, smooth, and rise about four feet high. The leaves, which grow upon the stalks, are entire and heart-shaped; they are sawed on the edges, each indenture ending in a weak spine. The stalks are terminated by large heads of flowers, growing in clusters; they are of a whitish yellow colour, and inclosed in a scaly empalement. These are succeeded by small oblong seeds, crowned with a bristly down.

This sort may be propagated by seeds, or parting of the roots; the latter is commonly practised where there are any of the plants, but the seeds are more easily conveyed to a distant place. The best time to part the roots is in autumn; it delights in shade, and requires no farther care but to keep it clean from weeds.

The third sort grows naturally on the *Alps*, and on the mountains of *Austria*; this rises with an upright single stalk near four feet high, garnished with sinuated leaves, which are very prickly, and embrace the stalks with their base; the flowers are produced at the top of the stalk, surrounded by a cluster of broad prickly leaves, sitting close to the stalk. This is a perennial plant, which may be propagated in the same manner as the former, and requires a moist soil and a shady situation.

The fourth sort grows naturally in *Siberia*. This hath a perennial root, composed of thick fleshy fibres. The leaves which rise immediately from the root, are near a foot long, and six inches broad in the middle, diminishing toward each

each end; these have scarce any foot-stalks; they are of a deep green on their upper side, but white on their under, and sharply sawed on their edges. The stalks rise more than six feet high, and are striated, of a reddish colour, garnished with heart-shaped leaves, which almost embrace the stalks with their base; each branch is terminated by one large globular head of yellowish flowers, included in a scaly empalement, each scale ending with a sharp spine. It may be propagated in the same manner as the two former sorts, but requires a moist soil and shady situation. The inhabitants of *Siberia* eat the tender stalks of this plant, when boiled, instead of other vegetables.

COA. See Hippocratea.

COAST-MARY. See Tanacetum.

COCCIGRIA. See Rhus.

COCCOLOBA. *Brown. Hist. Jam.* 209. The Sea-side Grape.

The Characters are,

The flower has one permanent petal which is cut into five segments; it has a fleshy umbilical nectarium which surrounds the germen, and six, seven, or more erect spreading stamina, and an oval germen, which afterwards turn to a fleshy berry including an oval nut, which is wrapped up in the petal of the flower.

The Species are,

1. COCCOLOBA *foliis crassis orbiculatis, sinu aperto. Hist. Jam.* 209. Sea-side Grape with round thick leaves which are open at the base.

2. COCCOLOBA *foliis cordato-oblongis, racemo terminatrice, caule arboreo. Burm.* The Sea-side Grape with oblong heart-shaped leaves, and a tree-like stalk, terminated by long bunches of fruit.

3. COCCOLOBA *foliis cordato-ovatis, racemo terminatrice.* Sea-side Grape with heart-shaped oval leaves, and the branches terminated by long bunches of fruit.

4. COCCOLOBA *foliis peltato-cordatis.* Sea-side Grape with target heart-shaped leaves.

5. COCCOLOBA *foliis lanceolatis venosis, uvis minoribus punctatis.* Sea-side Grape with spear-shaped veined leaves, and small spotted fruit; called Checquered Grape in *America*.

6. COCCOLOBA *foliis ovato-lanceolatis acuminatis, caule arboreo.* Mountain Grape with oval spear-shaped leaves ending in acute points, and a tree-like stalk.

The first sort grows naturally in most of the islands in the *West-Indies*, upon the sandy sea shores, from whence the inhabitants have given it the title of Sea-side or Mangrove Grape; this sends up several woody stalks from the root, which rise eight or ten feet high, with a light brown smooth bark, garnished with leaves which are placed alternately; they are very thick and stiff, almost round, from five to seven inches diameter, of a lucid green on their upper side, and veined on their under, standing upon short foot-stalks. The flowers come out from the wings of the stalks; they are disposed along the foot-stalk in long slender bunches, like those of the common Currant; these bunches are five or six inches long. The flowers are white, and the petal is cut into six parts; these are succeeded by berries about the size of a common Grape, of a purplish red colour, inclosing a nut of the same shape.

This plant is figured by *Lobel* under the title of *Populus novi orbis*, and has been copied by *Parkinson* in his *Herbal*, and several others.

The second sort grows naturally about *Carthagena*; this sends out many strong stalks from the root, which rise near twenty feet high, and are covered with a smooth gray bark. The leaves are from seven to nine inches long, and from three to four broad; they are indented at the foot-stalk like a heart, but end in a point, having several transverse veins running alternately from the midrib to the border, of a thick

stiff consistence, and of a lucid green on their upper side. The flowers are produced in long slender bunches at the end of the branches; they are composed of five white acute-pointed petals, which spread open in form of a star; these are succeeded by roundish purple fruit, smaller than those of the former sort, and not so well flavoured.

The third sort grows naturally at *La Vera Cruz* in *New Spain*; this sends up many shrubby stalks from the root, which rise five or six feet high, having a light gray bark. The leaves are oval and heart-shaped, three inches long, and two and an half broad, indented at their foot-stalks; these are not so stiff as those of the two former sorts. The fruit is disposed in a slender bunch at the end of the branches; they are small, and of a dark purple colour, and are never eaten by the inhabitants.

The fourth sort grows naturally at *Campeachy*; this sends up many slender ligneous stalks from the root, which rise to the height of seven or eight feet, covered with a gray bark, garnished with heart-shaped leaves about four inches long and three broad, whose foot-stalks are joined to the under part of the leaves, like the handle of a target. The leaves are of a lucid green, and smooth on their upper side; the flowers and fruit of this sort I have not seen.

The fifth sort grows naturally in *Jamaica*; this sends up many slender ligneous stalks from the root, which rise four or five feet high, covered with a brown bark. The leaves are six inches long and three broad, having many strong veins running from the midrib toward the border; they are of a light green colour, and are not so stiff at the former. The fruit is small, of a purple colour, growing in slender bunches from the end of the branches.

The sixth sort grows naturally on the north side of the island of *Jamaica* upon the mountains, so is generally there called the Mountain Grape; this sort grows to a large size, and is esteemed for its wood, which is ranked among their best sort of timber. The trunk of this tree grows to the size of a man's body; it rises to the height of thirty feet, sending out side branches, which are garnished with oval spear-shaped leaves, ending in acute points; they are six inches long, and two and a half broad toward their base; of a bright green on their upper side, but are pale on their under, of a thick consistence, and stand upon short foot-stalks. The fruit of this is produced on long slender foot-stalks; they are of a purplish colour, and are almost as large as those of the first sort.

These plants rise easily from seeds, if they are sown in pots, and plunged into a hot-bed of tan; but as they do not produce fruit in *England*, the seeds must be procured from the *West-Indies*. When the plants are come up about two or three inches high, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed of tan, where they must be shaded from the sun until they have taken new root; after which they must be treated in the same manner as the *Annona* and other tender plants from hot countries, giving them a proper share of air in warm weather, and gently refreshing them with water; but they should not have too much wet, for they do not perspire much, their leaves being of a very close contexture, especially those of the first and second sorts. In autumn these plants should be removed into the hot-house, and plunged into the bark bed, otherwise they will not make great progress; therefore they should always remain in the tan bed, giving them plenty of air in summer, when the weather is warm.

The leaves of these plants continue in verdure all the year, so make a fine appearance in the hot-house in winter; but I have never seen the flowers of either sort produced here.

COCHLEARIA. *Lin. Gen. Plant.* 720. Spoonwort, or Scurvy Grafs.

The Characters are,

The flower hath four petals, placed in form of a cross; it hath six stamina, four of which are longer than the other two. The germen is heart-shaped, which afterward becomes a gibbous, heart-shaped, compressed pod, fastened to the style, having two cells, in each of which are lodged four roundish seeds.

The Species are,

1. COCHLEARIA *foliis radicalibus subrotundis, caulinis oblongis subsinuatis. Flor. Lapp.* 256. Common or round-leaved Scurvy Grafs.

2. COCHLEARIA *foliis radicalibus lanceolatis, integerrimis, caulinis sinuatis.* Sea Scurvy Grafs.

3. COCHLEARIA *foliis reniformibus, integris. Hort. Cliff.* 498. Least Welch Scurvy Grafs.

4. COCHLEARIA *foliis hastatis, angulatis. Flor. Suec.* 196. Danish, or Ivy-leaved Scurvy Grafs.

5. COCHLEARIA *foliis radicalibus lanceolatis, crenatis, caulinis incis. Hort. Cliff.* 332. Horse Radish.

6. COCHLEARIA *foliis caulinis cordato-sagittatis, amplexicaulibus. Hort. Cliff.* 332. Tallest Scurvy Grafs with a Woad leaf.

The first sort grows naturally on the sea shore in the north of England, and in Holland, but is cultivated for use in the gardens near London: this is an annual plant, for the seeds are sown, and the plants decay within the compass of one year, but the seeds should be sown early in autumn; it hath a fibrous root, from which arise many round succulent leaves, which are hollowed like a spoon; the stalks rise from six inches to a foot high; these are brittle, and garnished with leaves which are oblong and sinuated. The flowers are produced in clusters at the end of the branches, consisting of four small white petals, which are placed in form of a cross; and are succeeded by short, roundish, swelling seed vessels, having two cells, divided by a thin partition; in each of these is lodged four or five roundish seeds.

This is propagated in gardens for medicinal uses; which is done by sowing the seeds in July, soon after they are ripe, in a moist shady spot of ground; and when the plants are come up, they should be thinned, so as to be left at about six inches distance each way. The plants that are taken out may be transplanted into other shady borders, if you have occasion for them; and at the same time all the weeds should be hoed down, so as to clear the plants entirely from them, that they may have room to grow strong. In the spring these plants will be fit for use; and those that are suffered to remain will run up to seed in May, and perfect their seeds in June. If this plant is sown in the spring, the seeds seldom grow well, therefore the best time is soon after they are ripe.

The Sea Scurvy Grafs is also used in medicine; but this grows in the salt marshes in Kent and Essex, where the salt water overflows it almost every tide; and can rarely be made to grow in a garden, or at least to last longer there than one year; but it being easily gathered in the places beforementioned, the markets are supplied from thence by the herb-women, who make it their business to gather herbs.

The little Welch Scurvy Grafs is a biennial plant, and may be preserved in a garden, if planted in a strong soil and a shady situation. This plant grows plentifully in Muscovy, as also in Davis's Streights.

The fourth sort is a low trailing plant, whose stalks grow six inches long, and lie prostrate on the ground; the leaves are angular, and in shape like those of Ivy. This is found growing naturally in some parts of England, and is annual.

The sixth sort is a biennial plant, which usually grows about a foot and an half high, with upright stalks, which are garnished with angular heart-shaped leaves, embracing

the stalks with their base; the flowers are produced in loose spikes at the end of the branches, they are very small, white, and are succeeded by short swelling pods filled with round seeds. This may be propagated by seeds, as the common sort: and if sown in autumn, will more certainly succeed than in the spring.

The Horse Radish is propagated by cuttings or buds from the sides of the old roots. The best season for this work is in October or February; the former for dry lands, the latter for moist; the ground should be trenched at least two spits deep, or more if it will allow of it. The manner of planting it is as follows: Provide yourself with a good quantity of offsets, which should have a bud upon their crowns, but it matters not how short they are; therefore the upper part of the roots which are taken up for use, should be cut off about two inches long with the bud to it, which is esteemed the best for planting. Then make a trench ten inches deep, in which you should place the offsets at about four or five inches distance, with the bud upward, covering them up with the mould that was taken out of the trench: then proceed to a second trench in like manner, and continue the same till the whole spot of ground is planted. After this, level the surface of the ground even, observing to keep it clear from weeds, until the plants are so far advanced, as to be strong enough to over-bear and keep them down. With this management, the roots of the Horse Radish will be long and strait, and free from small lateral roots; and the second year after planting will be fit for use.

CODLIN-TREE. See Malus.

COFFEA. *Lin. Gen. Pl.* 209. The Coffee-tree.

The Characters are,

The flower hath one petal, which is funnel-shaped, having a narrow cylindrical tube, and is plain at the top, where it is indented in five parts; it hath five stamina which are fastened to the tube. The roundish germen afterward becomes an oval berry, containing two hemispherical seeds, plain on one side, and convex on the other.

We have but one Species of this genus, viz.

COFFEA. *Hort. Cliff.* 59. The Coffee tree.

This tree is supposed to be a native of Arabia Felix, where it was first cultivated for use, and to this day, is the country from whence the best Coffee is brought to Europe, though the plant is now propagated in many parts of both Indies; but the produce of those countries being greatly inferior to that of Arabia, hath occasioned its present disrepute in England, so that it is scarce worth importing; but this might be remedied, if the Coffee planters in the West-Indies, could be prevailed on to try a few experiments, which I shall hereafter propose, being founded on those which have been made in England, upon the berries produced here. But I shall first treat of the plant, with its culture in England.

This is a low tree in the native country of its growth, where it seldom rises more than sixteen or eighteen feet high; the main stem grows upright, and is covered with a light brown bark; the branches are produced horizontally and opposite, which cross each other at every joint, so that every side of the tree is fully garnished with them, and form a sort of pyramid, the leaves also stand opposite; these when fully grown, are about four or five inches long, and two inches broad in the middle, decreasing toward each end; the borders are waved, and the surface is of a lucid green. The flowers are produced in clusters at the base of the leaves, fitting close to the branches; these are tubulous, and spread open at the top, where they are divided into five parts; they are of a pure white, and have a very grateful odour, but are of short duration. These are succeeded by oval berries, which are first green; when fully grown, they turn red, and afterward change to black when

fully ripe. These have a thin pulpy skin, under which are two seeds joined, which are flat on the joined sides, with a longitudinal furrow, and convex on their outer side.

As the Coffee tree is an ever-green, so it makes a beautiful appearance at every season in the stove, but particularly when it is in flower, and also when the berries are red, which is generally in the winter, so that they continue a long time in that state; therefore there is scarce any plant, that more deserves a place in the stove than this.

It is propagated by the berries, which must be sown soon after they are gathered from the trees, for if they are kept out of the ground any time they will not grow. I have frequently sent the berries abroad by the post, but when they have been a fortnight in their journey they have all failed, and this has constantly happened every where, for the berries that were sent from *Holland* to *Paris* did not grow; nor did those that were sent from *Paris* to *England* grow: so that wherever these trees are desired, the young plants must be sent, if it be at any distance from the place where they grow.

The berries should be planted in small pots, and plunged into a hot-bed of tanners bark. If the bed be of a proper temperature of warmth, the plants will appear in a month or five weeks time, and in about six weeks more will be fit to transplant. For as many of the berries will produce two plants, so the sooner they are parted, the better; for when they grow double till they have made large roots, they will be so intermixed and entangled, as to render it difficult to separate them, without tearing off their fibres, which will greatly prejudice the plants. When these are transplanted, they must each be put into a separate small pot, and plunged into the tan bed again; which should be stirred up to the bottom, and if required, some new tan should be mixed with it, to renew the heat. Then the plants should be gently watered, and the glasses of the hot-bed must be shaded every day till they have taken new root; after which the plants should have fresh air admitted to them every day, in proportion to the warmth of the season: during the summer they will require frequently to be refreshed with water, but they must not have it in too great plenty: for if the roots are kept too moist, they are very subject to rot, then the leaves will soon decay and drop off, and the plants become naked; when this happens, they are seldom recovered again. The first sign of these plants being disordered, is, their leaves sweating out a clammy juice, which attracts the small insects, which frequently infest those plants in stoves, which are not in health, and these cannot be destroyed, till the plants are recovered to vigour: for although the plants are ever so carefully washed and cleared from these insects, yet they will be soon attacked by them again, if they are not recovered to health, for these insects are never seen upon any of the plants while they are in perfect vigour; but when they are disordered, they soon spread over all the leaves and tender parts of the plants, and multiply exceedingly; so that upon the first attack, the plants should be shifted into fresh earth, and all possible care taken to recover them, without which all the washing and cleaning of the plants will be to little purpose. The disorders attending the Coffee trees, generally proceed from either being put into pots too large for them, nothing being of worse consequence than over potting them; or from the earth being too stiff, or over watered. If these errors are avoided, and the stove kept always in a proper temperature of heat, the plants will thrive, and produce plenty of fruit annually.

I have made trial of several compositions of earth, for these plants, but have found none of them equal to that of a kitchen garden, where the soil is naturally loose, and not subject to bind; especially if it has constantly been

well wrought and properly dunged, this without any mixture, is preferable to any other.

When the plants are transplanted, their roots should not be too much cut or trimmed; the decayed or rotten fibres should be pruned off, and those which are closely matted to the side of the pots should be trimmed, but not cut too near to the stem, for the old fibres do not put out new roots very kindly, especially those which are become tough, so that there should always be a sufficient number of young fibres left to support the plants, till new ones are produced.

The Coffee plants were first carried from *Arabia* to *Batavia* by the *Dutch*, and from thence they were afterward brought to *Holland*, where great number of the plants were raised from the berries which those plants produced, and from these most of the gardens in *Europe* have been furnished. A great number of these young plants, which were raised at *Amsterdam*, were sent to *Surinam* by the proprietors of that island; where the trees were soon propagated in great plenty, and from thence the plants have been dispersed to most of the islands in the *West-Indies*: for as the plants raised from the berries, produce fruit in eighteen months from planting, in the warm countries, so plantations of these trees may be soon made in any of those countries, where the temperature of the air is proper for their production; but the trees will not grow in the open air in any country where there is a winter, so that without the tropicks they cannot be expected to grow abroad.

The *French* have made great plantations of these trees in their settlements in the *West-Indies*, and also in the isle of *Bourbon*, from whence they import great quantities of Coffee annually to *France*; which, although greatly inferior in quality to the *Arabian*, yet it is consumed, otherwise they would not continue that branch of commerce. In the *British* colonies of *America*, there have been some large plantations made of Coffee trees; and it was proposed to the parliament, some years past, to give a proper encouragement for cultivating this commodity in *America*, so as to enable the planters to undersell the importers of Coffee from *Arabia*; accordingly there was an abatement of the duty payable on all the Coffee which should be of the growth of our colonies in *America*, which was at that time supposed would be a sufficient encouragement, for the planters to improve this branch of commerce: but the productions of those countries, being greatly inferior in quality to that of *Arabia*, hath almost ruined the project; and unless the planters can be prevailed on to try some experiments to improve its quality, there can be little hope of its becoming a valuable branch of trade; therefore I shall beg leave to offer my sentiments on this article, and sincerely wish what I have to propose may be found useful for the instruction of the Coffee planters; for as my opinion is founded upon experiments, so it is not mere theory or supposition.

The great fault of the Coffee which grows in *America*, is the want of flavour, or having a disagreeable one. The berries are much larger than those which are imported from *Arabia*, and consequently have not so much spirit or flavour. This may be owing to several causes; the first is that of its growing in a soil too moist, which is always known to increase the size of fruit and vegetables, but their quality is greatly diminished thereby. The second is from the gathering of the berries too soon; for I have been credibly informed, that it is the constant practice of the planters, to gather the fruit when it is red; at which time the berries are much larger, and of greater weight, than those which are permitted to ripen perfectly on the trees, which is not till they are turned black, and their outer pulp becomes dry, and the skins shrink; then the berries are much smaller than before, and the outer cover will easily separate from the berry; which I have always been informed has been

the complaint of the planters, that this was with great difficulty and trouble effected. A third cause I imagine may be in the drying of the berries when gathered; which must be constantly attended to, for they cannot be too much exposed to the sun and air in the day time, but they must be every evening removed under cover, and carefully screened from dews and rain; nor should they be placed near any sort of liquid or moisture, for these berries are very subject to imbibe moisture, and thereby acquire the flavour of the liquid, of whatever sort it be; and the berries will be enlarged, but the flavour diminished by it, as from many experiments I can affirm: for a bottle of rum being placed in a closet, in which a canister of Coffee berries closely stopped, was standing on a shelf at a considerable distance, in a few days had so impregnated the berries, as to render them very disagreeable; the same also hath happened by a bottle of spirits of wine standing in the same closet with Coffee and Tea, both which were in a few days spoiled by it. Therefore from many experiments of this nature, which I have made upon Coffee, it appears to me that it should never be brought over in ships freighted with rum, nor should the berries be laid to dry in the houses where the sugars are boiled, or the rum distilled. I have also been informed by a gentleman who has a very good estate in *Jamaica*, and who has lived many years in that island, that the planters frequently boil the Coffee berries before they are dried. As this information comes from a gentleman of great skill and veracity, I cannot doubt of the fact; and if so, this alone is sufficient to spoil the best Coffee in the world; so that I am at a loss to guess the reason for this practice, which, as it appears to me, can only be intended to increase the weight, therefore must be imputed to avarice, the bane of every publick good.

There was some time past an imperfect account printed in the papers, of the cause why the *American* Coffee was not so good as that which comes from *Arabia*, in which it was supposed that the goodness of the latter proceeded from the length of time which the berries had been kept: therefore the author proposes, that the *American* Coffee berries should be kept many years, which he says will render them equally good. This is contrary to all the experience I have had, or can learn, from those who have seen the whole progress of Coffee in *Arabia*, with their manner of drying and packing it to send abroad; for two gentlemen who had lived there some years assured me, that the berries, when first gathered, were much better than those which are kept any time. And a curious gentleman who resided in *Barbadoes* two years, also told me, that he never drank better Coffee in any part of the world, than what he made from the fresh berries, which he gathered himself, and roasted as he had occasion for them; which is also confirmed by the trials which have been made with the berries which grow in the stoves in *England*, which make a better flavoured liquor, than the best *Arabian* Coffee berries which can be procured in *England*; therefore I wish those who are inclinable to cultivate these trees in *America*, would make choice of a soil rather dry than moist, in which the trees will not make so great progress, as those which grow in a wet soil, nor will the produce be so great; but as the quality of the produce will be so much improved, so it will certainly be of greater advantage to them.

The next thing is, to permit the berries to remain so long upon the trees, till their skins are shrivelled, and will fall from the trees when they are shaken, which it is true will greatly diminish their weight, but then the commodity will be more than double the value of that which is gathered sooner: for in *Arabia*, they always shake the berries off the trees, spreading cloths under them to receive them, and only take such as readily fall at each time.

When the berries are full ripe, they should be shaken off when the trees are perfectly dry, and spread abroad upon cloths in the sun to dry, carrying them every evening under cover, to prevent the dews from falling on them, or the rain if any should happen: and when they are perfectly dry, they should have their outer skins beaten off; then carefully packed up in cloths or bags, three or four times double, and consequently kept in a dry situation. When they are shipped for *England*, it should be on board those vessels which have no rum, lest the Coffee should imbibe the flavour, which cannot be prevented when stowed in the same place. Some years past, a Coffee ship from *India*, had a few bags of pepper put on board, the flavour of which was imbibed by the Coffee, and the whole cargo spoiled thereby.

As the quantity of Coffee now consumed in *Britain* is very much increased of late years, so it will certainly be worthy of publick consideration, how far it may be necessary to encourage the growth of it in the *British* colonies: and certainly it deserves the attention of the inhabitants of those colonies, to improve this commodity to the utmost of their power; and not to have so much regard to the quantity, as to the quality of it; for although the former may appear to have the advantage of the latter in point of profit, yet the goodness of every commodity, must always claim the preference, and thereby will be found of more lasting advantage to the cultivator.

COIX. *Lin. Gen. Plant.* 927. Job's Tears.

The Characters are,

It hath male and female flowers on the same plant; the male flowers are disposed in a loose spike. The petal has two oval valves. These have each three hairy stamina, terminated by oblong four-cornered summits. There are a few female flowers situated at the base of the male spike in the same plant; the petal hath two oval valves. They have a small oval germen, which afterward becomes a hard roundish smooth seed.

The Species are,

1. COIX *feminibus ovatis*. *Hort. Cliff.* 434. Coix with oval seeds; or, Job's Tears.
2. COIX *feminibus angulatis*. *Hort. Cliff.* 438. Coix with angular seeds; or, *American* Job's Tears.

The first sort grows naturally in the islands of the *Archipelago*, and is frequently cultivated in *Spain* and *Portugal*, where the poor inhabitants grind the grain to flour in a scarcity of Corn, and make a coarse sort of bread of it.

It is an annual plant, which seldom ripens its seeds in *England*, unless the season proves very warm; from a thick fibrous root is sent out two or three jointed stalks, which rise two feet high, garnished with single, long, narrow leaves at each joint, resembling those of the Reed; at the base of the leaves come out the spikes of flowers, standing on short foot stalks; these spikes are composed of male flowers only, and below them is situated one or two female flowers; the male flowers decay soon after they have shed their farina; but the germen of the female flowers swell to a large oval seed, which is hard, smooth, and of a gray colour, greatly resembling the seeds of Gromwel, from whence this plant has been by several writers titled, *Lithospermum*.

Those who are desirous to cultivate this plant in *England*, may procure the seeds from *Portugal*; these should be sown on a moderate hot-bed in the spring, to bring the plants forward, and afterward transplant them on a warm border, allowing each two feet room at least; and when the plants have taken root, they will require no farther care, but to keep them clean from weeds. These will flower about *Midsummer*, and in warm seasons the seeds will ripen at *Michaelmas*.

The second sort will grow to the height of seven or eight feet; and the stems become hard, like the Reed, or *Indian*

Corn: these branch out, and produce several spikes of flowers; but this sort will not live in the open air in *England*, therefore should be planted in pots, and plunged in the bark stove, where it will live through the winter, and produce ripe seeds the second year; and may be continued longer, if desired.

COLCHICUM. *Lin. Gen. Plant.* 415. Meadow Saffron.

The Characters are,

The flower hath neither empalement or spatba; it hath one petal, rising with an angular tube from the root, and is divided at the top into six oval concave segments; it hath six stamina with four valves. The germen is situated near the root, which afterwards becomes a capsule with three lobes, having a seam on the inside, dividing it into three cells, which contain several roundish rough seeds.

The Species are,

1. COLCHICUM *foliis planis lanceolatis, erectis.* *Hort. Cliff.* 140. Colchicum with plain, erect, spear-shaped leaves; or, Common Meadow Saffron.
2. COLCHICUM *foliis linearibus patentissimis.* *Lin. Sp. Pl.* 342. Meadow Saffron with very narrow spreading leaves.
3. COLCHICUM *foliis undulatis patentibus.* *Hort. Cliff.* 140. Meadow Saffron with waved spreading leaves, and chequered flowers.

There are several varieties of these flowers, which differ in their colour, and other little accidents, which are not lasting, so must not be ranged as distinct species. But as they are cultivated in flower gardens, so I shall beg leave to mention those varieties, which I have seen cultivated. These are most of them feminal variations from the first sort.

The most common Meadow Saffron hath a purplish flower.

The Meadow Saffron with white flowers.

Meadow Saffron with striped flowers.

Broad-leaved Meadow Saffron.

Striped leaved Meadow Saffron.

Many flowered Meadow Saffron.

Meadow Saffron with double purplish flowers.

Meadow Saffron with double white flowers.

Meadow Saffron with many white flowers.

The first sort grows naturally both in the west and north of *England*. I have observed it in great plenty in the meadows in *Warwickshire* in the beginning of *September*. The country people call the flowers Naked Ladies, because they come up naked, without any leaves or cover. This hath a bulbous root, about the size and shape of the Tulip root, but not so sharp pointed at the top, the skin or cover is also of a darker colour. The flowers come out in autumn; these arise with long slender tubes from the root, about four inches high, shaped like those of the Saffron, but are larger; they are of a pale purple colour, and divided into six parts at the top; the number of flowers is generally in proportion to the size of the roots, from two to seven or eight: in *March* the green leaves appear, these are commonly four to a full grown root; they are folded over each other below, but spread open above ground, standing cross-ways: they are of a deep green, and when fully grown, are five or six inches long, and one broad. The seed vessel comes out from between the leaves, in *April*, and the seeds ripen in *May*, soon after which the leaves decay.

The other varieties are supposed to have accidentally risen from the seeds of this, so that those who are desirous to obtain a variety of these flowers, should propagate them from seeds, by which means there may be more obtained.

The second sort grows naturally on the mountains in *Spain* and *Portugal*. This hath a smaller root than the first, and a darker coat; the flowers appear in *August* or *September*; these are cut into six long narrow segments, of a reddish purple colour, having six yellow stamina. The leaves

of this sort come up soon after the flowers decay, and continue green all the winter, like the Saffron; these are long narrow, and spread on the ground; in *June* these decay like the first sort.

The third sort grows naturally in the *Levant*, but is commonly cultivated in the *English* gardens. It flowers at the same time as the first sort, and the green leaves come up in the spring. The root of this species is supposed to be the *Hermodactyl* of the shops.

These are all very pretty varieties for a flower garden, producing their flowers in autumn, when few other plants are in beauty; and are therefore, by some, called Naked Ladies. The green leaves come up in the spring, which are extended to a great length in *May*, then the green leaves begin to decay; soon after which time, is the proper season to transplant their roots; for if they are suffered to remain in the ground till *August*, they will send forth fresh fibres, after which time it will be too late to remove them. The roots may be kept above ground till the beginning of *August*, at which time, if they are not planted, they will produce their flowers as they lie out of the ground, but this will greatly weaken their roots. The manner of planting their roots being the same as for Tulips, &c. I shall forbear mentioning it here, referring the reader to that article: and also for sowing the seeds, by which means new varieties may be obtained, I shall refer to the article *XIPHION*, where will be proper directions for this work.

COLDENIA. *Lin. Gen. Plant.* 159.

The Characters are,

It hath a funnel-shaped flower of one petal, spreading at the top, and obtuse; it hath four stamina, which are inserted in the tube of the petal. In the center is situated four oval germen, each supporting a hairy style. The germen afterwards become so many oval compressed rough fruit, terminated by four beaks, inclosed by the empalement.

We know but one Species of this genus, viz.

COLDENIA. *Flor. Zeyl.* 69. This is by Dr. *Plukenet* titled, *Teucris facie bisnagarica tetracoccus rostrata.* *Alm.* 363.

This is a native of *India*. It is an annual plant, whose branches trail on the ground; they extend about six inches from the root, garnished with short leaves sitting close to the branches; these are deeply crenated on their edges, and have several deep veins; they are of a glaucous colour, and come out without order. The flowers are produced at the wings of the leaves, growing in small clusters; these have four stamina, and but one petal, which is funnel-shaped, and cut into four segments at the top; they are of a pale blue colour, and very small; when the flower decays, the germen becomes a fruit composed of four cells, wrapped up in the empalement, each containing a single seed.

This plant is propagated by seeds, which must be sown upon a hot-bed in the spring; when the plants are fit to remove, they should each be put into a separate small pot, and plunged into a hot-bed of tanners bark, observing to shade them till they have taken fresh root, after which they should have air admitted to them every day in proportion to the warmth of the season, and gently watered two or three times a week in warm weather; but they must not have too much moisture. These plants must remain in the hot-bed, where they will flower in *June*, and the seeds ripen in *September*.

COLEWORTS. See *Brassica*.

COLOCASIA. See *Arum*.

COLLINSONIA. *Lin. Gen. Plant.* 38.

The Characters are,

The flower is funnel-shaped, of one petal which is unequal, cut into five parts at the top, the upper part being short and obtuse, and two of them being reflexed; the lower lip or beard is longer, ending

ending in many points. It hath two long bristly stamina, which are erect. It hath a quadrifid obtuse germen, with a large gland, supporting a bristly style, which afterward becomes a single roundish seed, situated in the bottom of the empalement.

We have but one sort of this plant, viz.

COLLINSONIA foliis cordatis oppositis. Collinsonia with heart-shaped leaves growing opposite.

This plant was brought from Maryland, where it grows wild; as it doth also in most other parts of North America, by the sides of ditches, and in low moist grounds, where it usually rises to the height of four or five feet.

This hath a perennial root and an annual stalk, which decays in the autumn, and fresh shoots come out in the spring. The stalks are square, and garnished with heart-shaped leaves placed opposite, which are sawed on their edges. The flowers are produced at the extremity of the stalks, in loose spikes; these have long tubes, and are divided into five parts at the top; the flowers are of a purplish yellow, and the lower segment is terminated by long hairs. The flowers appear in July, and the seeds ripen in autumn.

This plant may be easily propagated by parting of the roots in October. These roots should be planted at three feet distance, for they require much nourishment, otherwise they will not thrive. This plant should be planted in a moist soil and a sheltered situation.

COLOCYNTHIS. See Cucurbita.

COLUMBINE. See Aquilegia.

COLUMNEA. Lin. Gen. Plant. 710.

The Characters are,

The flower hath one petal, of the ringent or grinning kind, with a swelling tube, divided above into two lips; the upper being erect and entire, the lower is divided into three parts which spread open: it hath four stamina, two being longer than the other; these are inclosed in the upper lip. In the center is situated the roundish germen, which afterward becomes a globular berry with two cells, sitting on the empalement, containing several oblong seeds.

There is but one Species of this genus at present known, viz.

COLUMNEA. Lin. Sp. Plant. 638. Climbing Columnea, with a scarlet flower and a white fruit.

Plumier mentions a variety of this, with a yellowish flower and white fruit. But this is only a feminal variation, supposed to have accidentally risen from the seeds of the first.

This hath a climbing stalk, which fastens itself to the neighbouring plants whereby it is supported. The leaves are oval, sawed on the edges, and stand upon short foot-stalks; these, and also the stalks, are very hairy; but the plants, which were raised at Chelsea, decayed the following year, before they produced any flowers, so that I can give no description of them.

These plants are natives of the warmest parts of America, so are too tender to live in England, unless they are preserved in the stove. They are propagated by seeds, which must be sown in a good hot-bed; and when the plants come up, they must be treated in the same way as other tender exotick plants, which are kept in the bark stove.

COLUTEA. Tourn. Inst. R. H. 649. tab. 417. Bladder Sena.

The Characters are,

The flower is of the butterfly kind. The standard, wings, and keel, vary in their figure in different species. It hath ten stamina, nine of which are joined, and the other stands separate. In the center is situated an oblong germen, which afterward becomes a broad swollen pod with one cell, including several kidney-shaped seeds.

The Species are,

1. *COLUTEA arborea, foliolis obcordatis.* Hort. Cliff. 365. Common Bladder Sena.

2. *COLUTEA foliolis ovatis, integerrimis, caule fruticoso.* Shrubby Bladder Sena with oval leaves, which are entire.

3. *COLUTEA foliolis cordatis minoribus, caule fruticoso.* Eastern Bladder Sena with a blood-coloured flower, spotted with yellow.

4. *COLUTEA foliolis ovato-oblongis.* Hort. Cliff. 366. Ethiopian Bladder Sena with a scarlet flower.

5. *COLUTEA foliolis ovatis, emarginatis, leguminibus oblongis compressis acuminatis, caule arborco.* Bladder Sena with oval leaves indented at the top, oblong, compressed, pointed pods, and a tree-like stalk.

6. *COLUTEA herbacea foliis linearibus.* Hort. Upsal. 266. African annual Bladder Sena with small pointed leaves, and compressed pods.

7. *COLUTEA caulibus procumbentibus, foliolis ovato-linearibus, tomentosis, floribus alaribus pedunculis longissimis.* Bladder Sena with trailing stalks, oval narrow leaves, which are woolly, and flowers growing from the sides of the stalks with very long foot-stalks.

The first sort is commonly cultivated in the nursery gardens, as a flowering shrub, to adorn plantations. This grows naturally in Austria, and in the south of France and Italy. It hath several woody stems, which grow to the height of twelve or fourteen feet, dividing into many woody branches garnished with winged leaves, composed of four or five pair of oval leaves placed opposite, terminated by an odd one; these are indented at the top, and are of a grayish colour. The flowers come out from the wings of the leaves upon slender foot-stalks, about two inches long, each sustaining two or three flowers of the butterfly kind, whose standard is reflexed and large. The flowers are yellow, with a dark coloured mark on each petal; these are succeeded by inflated pods, an inch and an half long, having a seam on the upper side, containing a single row of kidney-shaped seeds, fastened to a placenta. There is a variety of this with reddish pods, which is equally common in the gardens, and is supposed to be only an accidental variety, for the plants do not differ in any other respect.

The seeds of the second sort were brought from the Levant by the Rev. Dr. Pococke, now bishop of Ossory. This seldom grows more than six or seven feet high; the branches are very slender, and spread out on every side; they are garnished with winged leaves, composed of nine pair of small, oval, entire lobes, terminated by an odd one; the flowers stand upon slender foot-stalks, about the same length of the former. The flowers also are like those, but are of a brighter yellow. This sort begins to flower early in May, and continues flowering till the middle of October.

The third sort was discovered by Dr. Tournefort in the Levant. This hath a woody stem, which sends out many branches on every side, which do not rise above seven or eight feet high; these are not so strong as those of the first sort, and are garnished with winged leaves, composed of five or six pair of small heart-shaped lobes, terminated by an odd one. The flowers proceed from the side of the branches, standing upon foot-stalks, each sustaining two or three flowers, shaped like those of the first sort, but smaller; they are of a dark red colour, marked with yellow.

The fourth sort grows naturally in Ethiopia, from whence the seeds were brought to Europe. This hath a weak shrubby stalk, which sends out many side branches growing erect, garnished with equal winged leaves, composed of ten or twelve pair of small, oval, oblong, hoary lobes. The flowers are produced at the upper part of the branches from the wings of the leaves, each foot-stalk sustaining three or four scarlet flowers, which are longer than those of the other sorts, and are not reflexed; these are succeeded by inflated pods, containing one row of kidney-shaped seeds.

The fifth sort grows naturally at *La Vera Cruz*, in *New Spain*. This hath a shrubby stalk, which rises to the height of twelve or fourteen feet, sending out many branches, garnished with winged leaves, composed of three pair of oval lobes, terminated by an odd one; these are indented at the top, and are of a light green. The flowers are of a bright yellow, and stand two or three upon each foot-stalk, and are succeeded by compressed pods near four inches long, which end in long points.

The sixth sort grows naturally at the *Cape of Good Hope*. This is an annual plant of little beauty, so is rarely cultivated but in botanick gardens for the sake of variety. It rises with a slender herbaceous stalk about two feet high, dividing upward into three or four branches, which are garnished with winged leaves, composed of five or six pair of very narrow lobes, near an inch long, which are a little hoary. The flowers are small, of a purplish colour, standing three together on slender foot stalks, which are succeeded by flat oval pods, each containing two or three kidney-shaped seeds.

The seeds of the seventh sort were sent me from the *Cape of Good Hope*. This plant hath many slender herbaceous stalks, which frequently trail on the ground, and are garnished with winged leaves, composed of twelve or fourteen pair of small, narrow, oval lobes, terminated by an odd one; these, and also the stalks, are covered with a whitish down. The flowers are very small, of a purple colour, and stand upon very long slender foot-stalks, each sustaining three or four flowers, which are succeeded by compressed pods little more than half an inch long, which are a little bent like a sickle, each containing a single row of small kidney-shaped seeds. This is a perennial plant, which, if sheltered in the winter, will continue several years, but the branches do not extend more than a foot in length, and unless they are supported, always trail upon the ground.

The three first sorts are very hardy shrubs, which thrive in the open air extremely well, so they are generally propagated for sale in the nursery gardens, but the first sort hath been long in *England*, so is more generally known and propagated than either of the other.

These are propagated by sowing their seeds any time in the spring, in a bed of common earth; and when the plants are come up, they must be kept clear from weeds; and the *Michaëlnas* following, they should be transplanted either into nursery rows, or in the places where they are designed to remain; for if they are let grow in the seed bed too long, they are very subject to have tap roots, which renders them unfit for transplantation; nor should these trees be suffered to remain too long in the nursery before they are transplanted, for the same reason.

The first sort will grow to the height of twelve or fifteen feet, and are very proper to intermix with trees of a middling growth in wilderness quarters, or in clumps of flowering trees.

The third sort does not grow so tall as the common, but makes a more regular shrub than that. The flowers of this sort are of a dusky red colour, spotted with yellow, so it makes a very pretty variety, and is as hardy as the common sort, therefore may be propagated by seeds in the same manner.

The fourth sort is tender, so will not live through the winters (when they are severe) in the open air in *England*; but, in mild winters, if they are planted in a dry soil and a warm situation, they will thrive very well; and those plants which live abroad, will flower much stronger, and make a finer appearance, than those which are preserved in the green-house; for these plants require a large share of air, otherwise they are apt to draw up weak, so seldom produce their flowers in plenty; therefore when any of the

plants are sheltered in winter, they must be placed as near the windows as possible, that they may have all the advantages of air; and in the spring, they must be hardened to bear the open air as soon as possible.

This sort is propagated by seeds as the former; if the seeds are sown early in the spring, upon a warm border of light earth, the plants will flower in *August*; and, if the autumn proves favourable, they will ripen their seeds very well; but there are some persons who sow the seeds upon a moderate hot-bed in the spring, whereby they bring the plants so forward as to flower in *July*, so that the seeds are always perfected from these plants: when these plants are transplanted, it should always be done while they are young, for they do not bear removing well when they are large.

The fifth sort grows naturally in a warm country, so is too tender to thrive in the open air in this country; this is propagated by seeds, which must be sown on a hot-bed in the spring, and when the plants are two inches high, they should be each transplanted into a separate small pot, and plunged into a hot-bed of tanners bark, observing to shade them till they have taken fresh root; after which they must be treated in the same way as other plants from the same climate, always keeping them in a stove, which should be of a moderate temperature of heat.

The sixth sort is a low annual plant, which seldom grows more than a foot and a half in height; the flowers being small, and having little beauty, it is seldom preserved but in botanick gardens; the seeds of this sort must be sown upon a moderate hot-bed in the spring, and the plants must be planted into small pots, and brought forward in another hot-bed; in *July* they will flower, when they may be exposed to the open air, in a warm situation, where the seeds will ripen in *September*, and the plants will soon after decay.

The seventh sort may be raised on a moderate hot-bed in the spring, and afterward exposed to the open air in summer; but in winter they must be sheltered under a frame, otherwise the frost will destroy them.

COLUTEA SCORPIOIDES. See Emerus.

COMA AUREA. See Chrysocoma.

COMARUM. *Lin. Gen. Plant.* 563. Marsh Cinquefoil.

The Characters are,

The flower hath five oblong petals, which are inserted in the empalement, but are much smaller. It hath twenty permanent stamina, which are inserted into the empalement, and a great number of small roundish germen collected into a head. The common receptacle afterward becomes a large fleshy fruit, having many pointed seeds adhering to it.

We know but one Species of this genus, which is,

COMARUM. *Fl. Lapp.* 214. Red Marsh Cinquefoil.

This plant hath creeping woody roots, which send out many black fibres, penetrating deep into the ground, from which arise many reddish stalks, about two feet high, which generally incline to the ground; these are garnished at each joint with one winged leaf, composed of five, six, or seven lobes, which rise above each other, the middle being the largest, the lower diminishing, and with their base embrace the stalks. The flowers are produced at the top of the stalks, three or four together on short foot-stalks, which have a large spreading empalement, red on the upper side, and divided at the top into ten parts; in the center sits the five petals, which are red, and not more than a third part the size of the empalement; within these are situated many germen, attended by about twenty stamina, terminated by dark summits. After the flower is past, the receptacle, which sits in the bottom of the empalement, becomes a fleshy fruit, somewhat like a Strawberry, but flatter, including a great number of pointed seeds.

As this plant grows naturally on bogs, so it is with difficulty preserved in gardens, for it must be planted in a soil as near to that of its natural growth as possible; it is very apt to spread much at the root, when in a proper situation; so whoever is inclinable to preserve this plant, may remove it from the places of its growth in *October*, and plant it on a bog, where there will be no danger of the plants succeeding. There are a few of these plants now growing upon a bog at *Hampstead*, which were planted there some years ago; but the nearest place to *London*, where it grows wild in plenty, is in the meadows near *Guildford* in *Surry*.

COMMELINA. *Lin. Gen. Plant.* 58.

The Characters are,

It hath a permanent heart-shaped spatha; the flower hath six concave petals, three of which are small and oval, the other are large, roundish, and coloured. It hath three nectariums, (which have been supposed to be stamina); there are three awl-shaped stamina, which recline; in the center is situated a roundish germen, which afterward becomes a naked globular capsule, with three furrows, having three cells, each containing two angular seeds.

The Species are,

1. COMMELINA *corollis inæqualibus, foliis ovato-lanceolatis, acutis, caule procumbente, glabro. Hort. Upsal.* 18. Commelina with unequal petals, oval, spear-shaped, pointed leaves, and a smooth trailing stalk.

2. COMMELINA *corollis inæqualibus, foliis ovato-lanceolatis, caule erecto, scabro, simplicissimo. Hort. Upsal.* 18. Commelina with unequal petals, oval spear-shaped leaves, and a single, upright, rough stalk.

3. COMMELINA *corollis inæqualibus, foliis lanceolatis, glabris, obtusis, caule repente. Lin. Sp. Plant.* 41. Commelina with unequal petals, smooth, spear-shaped, obtuse leaves, and a creeping stalk.

4. COMMELINA *corollis æqualibus foliis ovato-lanceolatis, subciliatis. Hort. Upsal.* 18. Commelina with equal petals, and oval spear-shaped leaves, which are hairy on their under side.

5. COMMELINA *corollis æqualibus, pedunculis incrassatis, foliis lineari lanceolatis. Lin. Sp. Plant.* 41. Commelina with equal petals, thick foot-stalks to the flower, and narrow spear-shaped leaves.

The first sort grows naturally in the islands in the *West-Indies*, and also in *Africa*; this is an annual plant, which hath several trailing stalks, two or three feet long, which put out roots at the joints, and strike into the ground; at each joint is placed one oval, spear-shaped leaf, ending in a point, which embraces the stalk with its base, and hath several longitudinal veins: it is of a deep green, and smooth. The flowers come out from the bosom of the leaves, included in a spatha, which is compressed and shut up, each having two or three flowers, standing upon short foot-stalks, composed of two large blue petals, and four smaller green ones, which have generally been termed the empalement of the flower; within these are situated three nectariums, each having a slender stamina fixed on the side; these surround the germen, which afterward becomes a roundish capsule having three cells; in each of these is lodged two angular seeds.

The second sort grows naturally in *Pensylvania*; this hath a perennial root, composed of many white fibres; the stalks rise two feet high, are upright, rough, herbaceous, and about the size of quills; these have a single leaf at each joint, which is shaped like those of the first sort, and embrace the stalks with its base; the flowers come out from the bosom of the leaves at the upper part of the stalk, sitting upon short foot-stalks; these are of a pale bluish colour, and are succeeded by seeds as the first sort.

The third sort grows naturally in *Africa*; this hath a fi-

brous root, which sends out many trailing stalks three or four feet long, which put out roots at every joint, and from them many more shoots are produced; so that where they have room to spread, they will cover a large surface of ground. The leaves of this sort are very like those of the first, but the flowers are larger and of a deep yellow; the petals of this are heart-shaped, and the seed vessels are larger.

The fourth sort grows naturally near old *Vera Cruz* in *New Spain*; this hath a thick fleshy root composed of several tubers, somewhat like those of *Ranunculus*; from this arise one or two inclining stalks, which send out side branches from their lower parts, which are garnished with oval, spear-shaped leaves, part of which have long foot-stalks, the others embrace the stalks with their base; they have short hairs on their under side, and toward the stalk, but are smooth above, of a deep green colour, and close every evening, or in cold weather. The flowers are produced toward the upper part of the stalks, from the bosom of the leaves, standing upon slender foot-stalks, which are composed of three blue petals, pretty large and roundish, and three smaller which are green; the seeds are like those of the other sorts.

The fifth sort grows naturally in the *West-Indies*; this hath trailing stalks like the first, which are garnished with narrow grassy leaves, embracing the stalks with their base; the flowers are produced at the end of the stalks, upon thick foot-stalks, three flowers generally sitting on each; they have three equal large petals of a sky blue, and three smaller which are green.

All the sorts are propagated by seeds; the first will thrive in the full ground, but if the seeds are sown upon a warm border of light earth in autumn, the plants will rise early in the spring; so from these good seeds may be expected, if the season proves favourable; whereas those which are sown in the spring, often lie long in the ground, so that they rarely ripen their seed. These plants have but little beauty, so that two or three of each sort, is as many as most people choose to have; therefore if the seeds are sown in autumn, where the plants are designed to remain, or the seeds permitted to scatter, the plants will require no farther care, but to keep them clear from weeds.

The second sort hath a perennial root; this seldom ripens seeds in *England*, but the roots send out offsets, by which the plant is easily propagated; this sort will live in the full ground in winter, provided it is planted in a sheltered situation: the best time to transplant and part these roots is about the end of *March*.

The other sorts are tender, so their seeds must be sown on a moderate hot bed in the spring, and when the plants are two inches high, they should be transplanted to a fresh hot bed to bring them forward; when they have taken root, they should have a large share of fresh air admitted to them every day in warm weather, to prevent their growing weak; and in *June* they may be carefully taken up and transplanted on a warm border of light earth, observing to shade them till they have taken root, after which they will require no other care, but to keep them clean from weeds. With this management the plants will flower and produce good seeds.

The third and fourth sorts may be continued if they are planted in pots, and in autumn placed in the bark stove; or if the roots of the fourth sort are taken out of the ground in autumn, and kept in a warm place in winter, they may be planted again in the spring, placing them on a hot-bed, to forward their shooting, and these will produce stronger plants than those which rise from seeds.

CONIUM. *Lin. Gen. Plant.* 299. Hemlock.

The Characters are,

It is an umbelliferous plant; the petals of the greater umbel are uniform;

uniform; each flower is composed of five unequal heart-shaped petals which turn inward; they have five stamina; the germen, which is situated under the flower, supports two reflexed styles, and afterward becomes a roundish channelled fruit, divided into two parts, containing two seeds.

The Species are,

1. *CONIUM seminibus striatis.* Hort. Upp. 92. Greater Hemlock.

2. *CONIUM seminibus aculeatis.* Hort. Cliff. 92. Hemlock with prickly seeds.

The first sort grows naturally on the side of banks and roads, in many parts of *England*; this is a biennial plant, which perishes after it hath ripened seeds. It hath a long taper root like a Parsnep, but much smaller. The stalk is smooth, spotted with purple, and rises from four, to upwards of six feet high, branching out toward the top into several stalks, which are garnished with decomposed leaves, whose small leaves are cut at the top into three parts; these are of a lucid green, and have a disagreeable smell. The stalks are terminated by umbels of white flowers, each being composed of about ten rays (or small umbels) which have a great number of flowers, spread open, each sitting upon a slender foot-stalk; the seeds are small and channelled, and like those of Anise.

The second sort grows naturally near the *Cape of Good Hope*, in *Africa*. This plant rarely grows more than nine inches high; the lower leaves are divided somewhat like those of the small wild Rue, and are of a grayish colour; those upon the stalk are much narrower, but of the same colour; the stalks are terminated by umbels of white flowers, each of these large umbels being composed of three small ones; and the involucre hath three narrow leaves, situated under the umbel.

The first sort grows wild in most parts of *England*, so is seldom allowed room in gardens, because it is supposed to have a poisonous quality; some physicians have affirmed, that it is so to all animals, while others have assured us, that it is eaten by the inhabitants of some parts of *Italy* when it is young, and is by them esteemed a great dainty. Mr. Ray mentions, that he has found the gizzard of a thrush full of Hemlock seeds, with four or five grains of Corn intermixed with it, which, in the time of harvest, that bird had neglected for Hemlock, so very fond was it of that seed, which has been reckoned pernicious: however, it is very certain, that scarce any animal will eat the green herb; for it is very common to see the Grass, and most other weeds, eat close where cattle are allowed to feed, and all the plants of Hemlock which were growing left untouched.

This plant is esteemed, by many physicians, as an excellent remedy to dissolve scirrhus tumours; and some have greatly recommended it for cancers; and most of them agree, that it may be prescribed as a good narcotick.

The second sort is an humble plant, and, being tender, will never become troublesome: for, unless the winters are very favourable, this plant will not live in the open air in *England*. The seeds of this sort should be sown in pots in autumn, soon after they are ripe, and placed under a common frame in winter, where they may be exposed to the open air at all times when the weather is mild, and only covered in bad weather. The plants will come up very early in the spring, and must then be exposed to the open air constantly, when the weather will permit, otherwise they will draw up very weak. As these plants do not bear transplanting well, so they should be thinned, and not more than four or five left in each pot; and, as the plants have no great beauty, so a few of them will be sufficient to continue the sort, where a variety of plants are preserved. The other culture is only to keep them clean from weeds, and, in very dry weather, to water them.

CONOCARPODENDRON. See Protea.

CONOCARPOS. Lin. Gen. Plant. 213. Button Tree.

The Characters are,

The flowers are collected in a globular head, each standing in a scaly empalement. At the bottom is situated a large compressed germen, divided into five parts at the top. The flower hath one petal, which is cut into five equal parts, and five slender stamina, which extend beyond the petal. The germen afterward becomes a single seed, inclosed in the scale of the fruit, which is shaped like the cone of the Alder tree.

The Species are,

1. *CONOCARPOS erecta foliis oblongis.* Upright Conocarpos with oblong leaves, commonly called Button Tree in the *West-Indies*.

2. *CONOCARPOS frutescens, caulibus procumbentibus.* Shrubby, trailing Conocarpos.

The first sort grows plentifully in most of the sandy bays in all the islands of the *West-Indies*. It rises with a woody upright stem, about sixteen feet high, sending out many side branches, which also grow erect, garnished with spear-shaped leaves, having broad short foot-stalks, and are placed alternate on every side the branches. The flowers grow upon short branches, which arise from the wings of the leaves; these have three or four small leaves on their lower part, under the flowers; each of these branches are terminated by six or eight conical heads of flowers, which have some resemblance to those of Acacia, but each of these come out of a scaly covering; the flowers are small, of a reddish colour, having five slender stamina, and one style, which stand out farther than the petal. The flowers are succeeded by single seeds, which are included in the scales of the conical fruit.

The second sort hath short crooked branches, which divide and spread out on every side, upon the ground; these are covered with a grayish bark, and their upper parts are garnished with oval thick leaves, a little larger than those of the Dwarf Box; they have very short foot-stalks, and are placed on every side the branches without order. The flowers are collected in small round heads, which come out single from the side of the branches, and in loose spikes at the end; these are small, and of an herbaceous colour; the scales are rough, and the cones are of a looser texture than those of the former sort.

Both these sorts are preserved in some curious gardens for the sake of variety, but they are plants of no great beauty. They are propagated from seeds, which must be obtained from the places of their natural growth. These seeds, if they are fresh, will come up very soon, if they are sown upon a good hot-bed; and if the plants are potted, and preserved in the bark stove, they will make great progress; but they are too tender to live in this country, unless they are constantly kept in the stove, and treated in the same manner with other exotick plants of the same country; observing, as they are natives of swamps, to supply them often with water; but in winter they must have it sparingly.

CONSOLIDA MAJOR. See Symphytum.

CONSOLIDA MEDIA. See Bugula.

CONSOLIDA MINIMA. See Bellis.

CONSOLIDA REGALIS. See Delphinium.

CONVAL LILY. See Convallaria.

CONVALLARIA. Lin. Gen. Plant. 383. Lily of the Valley.

The Characters are,

The flower hath one petal, which is bell-shaped, spread open and reflexed. It hath no empalement. It hath six stamina, which are inserted into the petal. In the center is situated a globular germen, which afterward becomes a globular berry, with three cells, containing one roundish seed.

The *Species* are,

1. CONVALLARIA *scapo nudo*. *Flor. Lapp.* 113. White Lily of the valley. There is a variety of this with reddish flowers, which is preserved in gardens.

2. CONVALLARIA *scapo nudo, foliis lateralibus*. Broad-leaved Lily of the valley. There is also a variety of this with double variegated flowers which is preserved in gardens.

3. CONVALLARIA *foliis alternis, floribus axillaribus*. *Flor. Suec.* 274. Common broad-leaved Solomon's Seal.

4. CONVALLARIA *foliis alternis, semiamplexicaulibus, floribus majoribus axillaribus*. Broad-leaved Solomon's Seal with a larger sweet flower.

5. CONVALLARIA *foliis amplexicaulibus, caule tereti, pedunculis axillaribus multifloris*. *Lin. Phil. Bot.* 218. Greatest broad-leaved Solomon's Seal.

6. CONVALLARIA *foliis alternis petiolatis, pedunculis axillaribus trifloris*. Broad-leaved Solomon's Seal with a white Hellebore leaf.

7. CONVALLARIA *foliis verticillatis*. *Flor. Lapp.* 114. Convallaria with leaves growing in whorls.

8. CONVALLARIA *foliis sessilibus, racemo terminali composito*. *Lin. Sp. Plant.* 315. Convallaria with leaves sitting close to the stalks, which are terminated by compound spikes of flowers.

9. CONVALLARIA *foliis amplexicaulibus plurimis, racemo terminali simplici*. *Lin. Sp. Plant.* 316. Convallaria with many leaves embracing the stalks, which are terminated by single bunches of flowers.

10. CONVALLARIA *foliis cordatis*. *Flor. Lapp.* 113. Convallaria with heart-shaped leaves.

The first sort grows naturally in great plenty in the woods near *Woburn*, in *Bedfordshire*, from whence the markets in *London* are generally supplied with the flowers. It is also cultivated in gardens, for the sweetness of the flowers; formerly it grew in great plenty on *Hampstead Heath*, but of late years it has not been so common there; for since all the trees have been destroyed, the plants have not flowered there as formerly, nor have the roots increased.

This hath a slender fibrous root, which creeps under the surface of the ground, and thereby propagates in great plenty. The leaves come up by pairs; their foot-stalks, which are about three inches long, are wrapped together in one cover, and at the top divide into two parts, each sustaining a single leaf, one of which arises a little above the other; these leaves are from four to five inches long, and near an inch and an half broad in the middle, lessening gradually to both ends; the foot-stalks of the flowers arise immediately from the root, on one side the leaves; these are naked, about five inches long, and are adorned towards their upper parts with pendulous white flowers, ranged on one side the stalk, which decline to one side; each flower stands upon a short separate foot-stalk, which are crooked. The flowers are open, of the short bell-shaped kind; they have six stamina, which are inserted in the petal of the flower, and are shorter than the tube, and a single style arising from the germen, which is triangular, and crowned by a three-cornered stigma: the germen afterward becomes a globular berry, of a red colour when ripe, inclosing three roundish seeds.

The second sort grows on the *Alps*; this has retained its difference in the garden, where it grew in the same soil and situation with the common sort, so I make no doubt of its being a distinct species. The other with a double variegated flower is supposed to be only a variety of this, therefore I have not enumerated it as a distinct species, though the flowers are much larger, and beautifully variegated with purple and white.

These plants require a loose sandy soil, and a shady situation; they are propagated by parting of their roots, which

multiply in great plenty. The best time to transplant and part the roots, is in autumn. They should be planted near a foot asunder, that their roots may have room to spread; for if they agree with the soil and situation, they will meet and fill the ground in one year. If these roots are planted in a rich soil, they will spread and multiply greatly, but will not be so productive of flowers.

The only culture which these plants require, is to keep them clean from weeds, and to transplant and separate the roots every third or fourth year, otherwise they will be so greatly matted together, as not to have proper nourishment, so the flowers will be but small, and few in number.

The third sort is the common *Solomon's Seal*, which is said to grow naturally wild in *England*, but I doubt ours is a different sort from that mentioned by *Caspar Baubin* under that title; for in two places where I have found it growing, the stalks were much shorter, the leaves were broader, and their borders turned inward; and this difference continues in the garden, where it grows in the same soil and situation with the common sort of *Germany*.

This plant hath a fleshy white root, as large as a man's finger, which creeps in the ground, and is full of knots, from whence it had the name of *Polygonatum*. In the spring arises several taper stalks, which grow near two feet high, adorned with oblong oval leaves, placed alternate, which embrace the stalks with their base; on the opposite side come out the foot-stalks of the flowers, which are about an inch long, dividing at the top into three or four smaller, sustaining a single tubulous flower, cut into six parts at the brim: these have each six slender stamina, surrounding a single style, which arises from the germen, and is crowned by a blunt stigma; the germen afterward becomes a round berry, about the size of *Ivy* berries, each inclosing three seeds.

The fourth sort doth not rise so high as the third, the leaves are broader, and half embrace the stalks with their base. It hath fewer flowers on each foot-stalk, and those are much larger, and smell sweet.

The fifth sort rises much higher, the leaves are broader, and embrace the stalks with their base; there are many more flowers on each foot-stalk, which have longer and narrower tubes than either of the former. This grows naturally in the northern parts of *Europe*.

The sixth sort hath large fleshy roots, full of knots, or joints, which send up many stalks four feet high, garnished with oblong oval leaves, near five inches long, and above two inches broad in the middle, having many deep longitudinal furrows, running parallel to the midrib, somewhat like those of white *Hellebore*. The flowers come out on the opposite side of the stalks from the leaves, having short foot-stalks, which divide into three smaller, each sustaining one flower, with a long slender tube, more closed at the top, than those of the other species, but the colour is the same.

The seventh sort rises with an upright stalk, about two feet high, garnished with long narrow leaves, which stand in whorls round the stalk, there are generally five of these placed at each joint; they are four inches long, and half an inch broad, smooth, and of a light green. The flowers come out from the same joints, standing upon short foot-stalks, each supporting five or six flowers, which are smaller, and have much shorter tubes than either of the former sorts; they are of a dirty white, tipped with green, and slightly cut into six parts at the top.

The eighth sort grows naturally in most parts of *North America*. This rises with an upright stalk above two feet high, garnished with oblong leaves, ending in sharp points, which are near five inches long, and two and an half broad; having three large longitudinal veins, with several smaller between, which join at both ends. The leaves are alternate, standing close to the stalks, and are of a light green.

on their upper side, but are paler on their under. The flowers are produced in branching spikes at the extremity of the stalks, each being composed of several small loose spikes of star-like flowers, of a pale yellow, which fall away without producing any seed.

The ninth sort is a native of the same countries as the eighth; this sends up stalks two feet high, which are garnished with many oblong leaves embracing them with their base. The flowers are produced in single spikes at the top of the stalks, which are in shape and colour like those of the eighth; but these are succeeded by small red berries, about the size of those of the Lily of the valley.

All these sorts of Solomon's Seal are very hardy plants, and delight in a light soil and a shady situation, so are very proper to plant in wilderness quarters under tall trees, where, if they are not crowded by lower shrubs, they will thrive and multiply exceedingly, and during the summer season will make an agreeable variety, the whole appearance of the plants being very singular.

They all multiply very fast by their creeping roots, especially when they are planted in a proper soil and situation. The best time to transplant and part the roots is in the autumn, soon after their stalks decay; those which are removed at that season, will grow much stronger, than those which are planted in the spring; but they may be safely transplanted any time after the stalks decay, till the roots begin to shoot in the spring. As these roots greatly increase, so they should be planted at a wide distance from each other, that they may have room to spread, for they should not be removed oftener than every third or fourth year, where they are expected to grow strong, and produce a good number of stalks, in which their beauty consists. The only culture these plants require, is to dig the ground between them every spring, and keep them clean from weeds.

The tenth sort is an humble plant, which, when transplanted into gardens, seldom rises above six inches high, and where it grows naturally not much more than half so high; this hath a fibrous creeping root, which spreads and multiplies greatly in the ground, sending up many slender stalks, each having for the most part two heart-shaped leaves, one standing above the other. The stalks are terminated by loose spikes of white star-like flowers, which are succeeded by small red berries.

It grows naturally in all the northern parts of Europe, and delights in a moist soil and shady situation, where it will spread and multiply in great plenty.

CONVOLVULUS. *Lin. Gen. Pl.* 198. Bindweed.

The Characters are,

The flower hath one large bell-shaped petal, which spreads open. It hath five short stamina, and a roundish germen. The empalement after-ward becomes a roundish capsule, with one, two, or three valves, containing several seeds which are convex on their outside, but on their inside angular.

The Species are,

1. CONVOLVULUS *foliis sagittatis utrinque acutis, pedunculis unifloris. Flor. Suec.* 173. Smaller Field Bindweed, commonly called Gravel Bindweed.

2. CONVOLVULUS *foliis sagittatis posticè truncatis, pedunculis unifloris. Prod. Leyd.* 427. Larger white Bindweed, called Bearbind.

3. CONVOLVULUS *foliis sagittatis posticè truncatis, pedunculis bifloris. Prod. Leyd.* 427. Syrian Bindweed, or Scammony.

4. CONVOLVULUS *annuus, foliis cordatis calycibus acutis, villosis.* Purple Bindweed with a roundish heart-shaped leaf, commonly called *Convolvulus major*, or greater Bindweed:

5. CONVOLVULUS *foliis cordatis, acuminatis, pedunculis trifloris.* Bindweed with heart-shaped, pointed leaves, and three flowers on each foot-stalk.

6. CONVOLVULUS *foliis cordatis trilobis villosis, calycibus*

lævibus, capsulis hirsutis, pedunculis bifloris. Blue Bindweed, with an angular Ivy leaf.

7. CONVOLVULUS *foliis cordatis angulato-nervosis, caule repente tubifero. Lin. Sp. Plant.* 154. Bindweed with heart-shaped leaves, having angular nerves, and a creeping stalk bearing tubers; commonly called *Spanish Potatoes*.

8. CONVOLVULUS *foliis palmatis, lobis septem-finuatis acutis, pedunculis unifloris, calycibus maximis patentibus.* Five-leaved Bindweed with smooth indented leaves and hairy stalks.

9. CONVOLVULUS *foliis hastato-lanceolatis, auriculis rotundatis, pedunculis multifloris.* Bindweed with spear-pointed leaves having rounded ears, and many flowers on each foot-stalk.

10. CONVOLVULUS *foliis cordatis subhastatisque villosis, caule petiolisque pilosis, pedunculis multifloris. Lin. Sp. Pl.* 159. Bindweed with heart-shaped leaves, somewhat spear-pointed and downy, with hairy stalks and foot-stalks, and many flowers on each.

11. CONVOLVULUS *foliis ovato-oblongis, glabris pedunculis unifloris, calycibus decempartitis.* Bindweed with oval, oblong, smooth leaves, and foot-stalks having a single flower, whose empalement is cut into ten parts.

12. CONVOLVULUS *hirsutissimus, foliis quinquelobatis, pedunculis longissimis bifloris.* Very hairy Bindweed, with leaves having five lobes, and very long foot-stalks with two flowers.

13. CONVOLVULUS *caule fruticoso, glabro, foliis quinquelobis, pedunculis geniculatis, unifloris, capsulis maximis.* Bindweed with a shrubby, smooth stalk, leaves having five lobes, many jointed foot-stalks with one flower, and very large seed vessels.

14. CONVOLVULUS *foliis emarginatis, pedunculis trifloris. Lin. Sp. Pl.* 159. Bindweed with indented leaves, and foot-stalks having three flowers.

15. CONVOLVULUS *foliis cordatis, glabris, pedunculis multifloris, seminibus villosis ferrugineis.* Bindweed with smooth, heart-shaped leaves, foot-stalks having many flowers, and seeds covered with an iron-coloured down.

16. CONVOLVULUS *foliis cordatis pubescentibus, caule perenni, villoso, pedunculis multifloris. Lin. Sp. Pl.* 155. Bindweed with soft, woolly, heart-shaped leaves, a hairy perennial stalk, and foot-stalks having many flowers.

17. CONVOLVULUS *foliis triangularibus acutis, floribus plurimis sessilibus patulis, calycibus acutis multifidis.* Bindweed with sharp-pointed triangular leaves, many spreading flowers set close to the stalk, and acute empalements ending in many points.

18. CONVOLVULUS *foliis cordatis, acuminatis, pedunculis bifloris.* Bindweed with heart-shaped, pointed leaves, and foot-stalks having two flowers.

19. CONVOLVULUS *foliis sagittatis posticè obtusis, caule repente, pedunculis unifloris. Lin. Sp. Plant.* 158. Bindweed with narrow-pointed leaves, which are obtuse at the foot-stalk, a creeping stalk, and one flower on each foot-stalk.

20. CONVOLVULUS *foliis cordato-sagittatis, pedunculis unifloris.* Bindweed with heart-shaped, arrow-pointed leaves, and foot-stalks having a single flower.

21. CONVOLVULUS *foliis cordato-ovatis, pedunculis unifloris, bracteis lanceolatis, flore sessile. Hort. Cliff.* 68. Bindweed with oval heart-shaped leaves, foot-stalks having one flower, spear-shaped bractæ, and the flower sitting close to the stalk.

22. CONVOLVULUS *foliis palmatis sericeis, pedunculis bifloris, calycibus acutis.* Bindweed with silky, palmated leaves, foot-stalks having two flowers, and sharp-pointed empalements.

23. CONVOLVULUS *foliis cordatis incisè & incanis, pedunculis bifloris, calycibus obtusis.* Bindweed with hoary heart-shaped leaves, which are jagged, foot-stalks having two flowers, and obtuse empalements.

24. CONVULVULUS *foliis lanceolato-ovatis glabris, caule declinato, floribus solitariis.* Lin. Vir. Cliff. Bindweed with smooth, oval, spear-shaped leaves, a declining stalk, and one flower upon each foot-stalk, commonly called *Convolvulus minor*.

25. CONVULVULUS *villosus, foliis lineari lanceolatis, caule recto, pedunculis multifloris.* Hairy Bindweed with narrow spear-shaped leaves, an upright stalk, and foot-stalks having many flowers.

26. CONVULVULUS *foliis lanceolatis, sericeis, caule declinato, radice repente, pedunculis multifloris.* Bindweed with silky spear-shaped leaves, a declining stalk, creeping root, and foot-stalks having many flowers.

27. CONVULVULUS *foliis lanceolatis, obtusis sericeis pedunculis multifloris.* Hort. Cliff. 68. Bindweed with blunt, spear-shaped, silky leaves, and foot-stalks having many flowers.

28. CONVULVULUS *foliis lineari-lanceolatis, acutis caule ramoso, recto, pedunculis unifloris.* Hort. Cliff. 68. Bindweed with narrow spear-shaped leaves, which are pointed, an upright branching stalk, and foot-stalks with one flower.

29. CONVULVULUS *foliis subovatis, obtusis, petiolatis pilosis, caule diffuso, pedunculis trifloris.* Flor. Zeyl. 76. Bindweed with oval, obtuse leaves, having hairy foot-stalks bearing three flowers, and diffused stalks.

30. CONVULVULUS *foliis reniformibus, pedunculis unifloris.* Hort. Cliff. 67. Bindweed with kidney-shaped leaves, and one flower on each foot-stalk; or, Sea Bindweed.

31. CONVULVULUS *foliis cordatis, angulatis, caule membranaceo, quadrangulari, pedunculis multifloris.* Flor. Zeyl. 72. Bindweed with angular heart-shaped leaves, a quadrangular membranaceous stalk, and foot-stalks having many flowers.

32. CONVULVULUS *foliis variis, pedunculis unifloris, radice tuberosâ cathartica.* Bindweed with variable leaves, foot-stalks with single flowers, and a tuberous root; or, the true Jalap.

The first sort is very common upon dry banks, and in gravelly grounds, in most parts of *England*, and is generally a sign of gravel lying near the surface. The roots of this shoot very deep into the ground, from whence some country people call it Devils Guts: this is a troublesome weed in gardens, so should be constantly rooted out.

The second sort is also a troublesome weed in gardens, when the roots are intermixed with those of trees and shrubs, or under hedges, where the plants cannot be easily destroyed: but in an open clear spot of ground, where they are constantly hoed down for three or four months, they may be effectually destroyed; for when the stalks are broken or cut, a milky juice flows out, and thereby the roots are soon exhausted and decay; as every small piece of the root will grow, so it renders this a troublesome weed to destroy, where they are intermixed with other roots.

The third sort grows naturally in *Syria*, where the roots of the plants are wounded, and shells placed under the wounds to receive the milky juice which flows out, which is inspissated, and afterward put up and exported: this is what is called Scammony in the shops: it is a very hardy plant, and will thrive very well in the open air in *England*, provided it is on a dry soil. The roots of this are thick, run deep into the ground, and are covered with a dark bark. The branches extend themselves on every side to the distance of ten or twelve feet, they are slender and trail on the ground, and are garnished with narrow arrow-pointed leaves. The flowers are of a pale yellow, and come out from the side of the branches, two sitting upon each long foot-stalk; these are succeeded by roundish seed vessels, having three cells, filled with seeds shaped like those of the former sort, but smaller. If the seeds of this sort are sown in the spring, on a border of light earth, the plants will come up, and require no other culture but to keep them clean from weeds, and thin the plants where they grow too close; for as the branches extend very far,

the plants should not be nearer than five feet asunder. The stalks decay in autumn, but the roots will abide many years.

The fourth sort is an annual plant, which grows naturally in *Asia* and *America*, but has been long cultivated for ornament in the *English* gardens, and is generally known by the title of *Convolvulus major*. Of this there are three or four lasting varieties; the most common hath a purple flower, but there is one with a white, another with a red, and one with a whitish blue flower, which hath white seeds. All these varieties I have cultivated many years, without observing them to change. If the seeds of these sorts are sown in the spring, upon a warm border where the plants are designed to remain, they will require no other culture, but to keep them clean from weeds, and place some tall stakes down by them, for their stalks to twine about, otherwise they will spread on the ground, and make a bad appearance. These plants, if they are properly supported, will rise ten or twelve feet high; they flower in *June*, *July*, and *August*, and will continue till the frost kills them. Their seeds ripen in autumn.

The fifth sort grows naturally in *Jamaica*. This sends out long branches, which twine about the trees and rise to a great height; the leaves are smooth, heart-shaped, ending in long points, and the ears at the base are large and rounded; they stand upon long slender foot-stalks. The flowers come out on the opposite side of the stalks, upon long foot-stalks, each sustaining three flowers, with longer tubes than those of the former, and are of a deeper blue colour. This is not so hardy as the former; so the seeds should be sown upon a hot-bed in the spring, to bring the plants forward, and toward the end of *May*, they should be planted out in warm borders, and treated in the same manner as the former sort.

The sixth sort grows naturally in *Africa* and *America*. It is an annual plant, which rises with a twining stalk eight or ten feet high, garnished with heart-shaped leaves, divided into three lobes which end in sharp points; these are woolly, and stand upon long foot-stalks; the flowers come out on long foot-stalks, each sustaining two flowers of a very deep blue colour, from whence it has been titled Anil or Indigo. This is one of the most beautiful flowers of this genus, and is undoubtedly a distinct species, though some have supposed it to be only a variety of the fourth sort: the leaves of this has three deeply divided lobes, and those of the fourth sort are entire. This sort is annual, and must be propagated in the same manner as the fifth. It flowers all the latter part of summer, and, in good seasons, the seeds ripen very well in the open air.

The seventh sort is that whose roots are eaten, and is generally called *Spanish* Potatoe; these roots are annually imported from *Spain* and *Portugal*, where they are greatly cultivated for the table, but they are too tender to thrive well in the open air in *England*; they are cultivated by the roots in the same way as the common Potatoe, but require much more room; for these send out many trailing stalks, which extend six or eight feet every way, and at their joints send out roots, which, in warm countries, grow to be large tubers, so that from a single root planted, forty or fifty large roots are produced. This is sometimes propagated by way of curiosity in *England*, but the roots should be planted on a hot-bed in the spring, and if the plants are kept covered in bad weather with glasses, they will produce flowers, and some small roots will be produced from the joints of the stalks; but if they are exposed to the open air, they seldom grow to be of any size.

The eighth sort grows naturally at *La Vera Cruz*, in *New Spain*. This rises with a strong winding stalk, to the height of twenty feet, dividing into several smaller, which fasten themselves about any of the neighbouring trees and shrubs;

and are garnished with leaves in shape of a hand, having seven lobes, which are spear-shaped, and deeply cut on their borders, ending in sharp points. The flowers are single on each foot-stalk, which are very long. The empalement of the flower is large, spreading open, and is divided deeply into five parts. The flowers are large, of a purple colour, and are succeeded by large roundish seed vessels, having three cells, in each of which is lodged a single seed.

This plant is tender, so the seeds should be sown on a hot-bed in the spring, and when the plants are fit to remove, they must be transplanted each into a separate pot, and plunged into a moderate hot-bed, observing to shade them from the sun till they have taken new root; then they should have a large share of air admitted to them every day, to prevent their drawing weak. When the plants are grown too tall to remain in the hot-bed, they must be shifted into larger pots, and placed in the bark stove, where, if they are allowed room, they will rise to a great height, and produce flowers, but it rarely produces seeds in *England*.

The ninth sort is an annual plant; it grows naturally near *Carthagera*, in *New Spain*. This rises with a twining slender stalk, ten or twelve feet high, garnished with arrow-pointed leaves, whose ears at the base are rounded. The flowers are produced in small clusters, standing on long foot-stalks; these are yellow, and are succeeded by three-cornered seed vessels, having three cells, in each of which are lodged two seeds.

This plant is annual, and too tender to thrive in the open air in *England*, so the seeds should be sown on a hot-bed in the spring, and the plants may be afterward treated in the same way as the eighth sort, with which management they will flower, and produce ripe seeds.

The seeds of the tenth sort were sent me from *Jamaica*. This is an annual plant, rising with slender, twining stalks, eight or nine feet high, garnished with heart-shaped leaves, which are downy. The flowers stand many together at the end of strong foot-stalks; they are purple, and are succeeded by roundish seed vessels with three cells, containing three small seeds.

This sort requires the same treatment as the eighth, being too tender to thrive in this country in the open air.

The eleventh sort was sent me from the island of *Barbuda*. This is an annual plant, which rises with twining stalks seven or eight feet high, garnished with oblong, oval, smooth leaves. The flowers come out at every joint on slender long foot-stalks, each supporting a large purple flower, whose empalement is cut almost to the bottom, in ten parts. The seeds and capsule are like those of the other species. This is a tender plant, so must be treated in the same manner as the eighth sort.

The twelfth sort grows naturally at *Carthagera*, in *New Spain*. This is a perennial plant, which rises with strong winding stalks, to the height of fourteen or sixteen feet, garnished with leaves divided into five lobes, standing upon short foot-stalks; the flowers stand upon long foot-stalks, each sustaining two purple flowers. The stalks, leaves, and every part of the plant, is closely covered with pungent stinging hairs of a light brown colour. This sort is tender, so must be treated in the same manner as the eighth.

The thirteenth sort grows naturally about *Tolu*, in *New Spain*. This hath a ligneous stalk covered with a purple bark, which twines about the trees, and rises to the height of thirty feet or more, garnished with leaves which are deeply divided into five sharp-pointed lobes. The flowers stand upon long thick foot-stalks, which have a knee in the middle; they are very large, of a purple colour, and are succeeded by round seed vessels, as large as a middling Apple, divided into three cells, each containing two very large smooth seeds.

This plant is too tender to thrive in the open air in *England*, so must be treated in the same manner as the eighth sort, but it grows too tall for the stoves here. I have had these plants upward of twenty feet high, which have sent out many side branches, extending so wide on every side, as to cover most of the neighbouring plants, so that I was obliged to remove them into a cooler situation, where they would not thrive.

The fourteenth sort grows naturally on the sea shores in most of the islands in the *West-Indies*, where the stalks trail on the ground, which are garnished with oval leaves, indented at the top. The flowers are large, of a purple colour, and are produced by threes, on very long foot-stalks; these are succeeded by large oval seed vessels, with three cells, each containing a single seed; this hath a perennial stalk, which spreads to a great distance, but is too tender to thrive in the open air in *England*, so must be treated in the same manner as the eighth sort, and may be continued two or three years in a warm stove; but it is apt to spread too far for a small stove, so that where there is not great room, it is not worthy of culture.

The fifteenth sort grows naturally in *Jamaica*; this rises with slender winding stalks, eight or ten feet high; the leaves of these are shaped a little like those of the common great white *Convolvulus*, but the foot-stalks, which are pretty long, do each sustain many purple flowers, growing in bunches. The seed vessels of this sort are three-cornered, and have three cells, each containing a single seed.

The sixteenth sort hath been long preserved in several curious gardens in *England*. It grows naturally in the *Canary* islands; this hath a strong fibrous root, from which arise several twining woody stalks, and where they have support, will grow more than twenty feet high, garnished with oblong heart-shaped leaves, which are soft and hairy. The flowers are produced from the wings of the leaves, several standing upon one foot-stalk; they are for the most part of a pale blue, but there is a variety of it with white flowers. It flowers in *June*, *July*, and *August*, and sometimes ripens seeds here; but as the plants are easily propagated by layers, and also from cuttings, so the seeds are not so much regarded, nor indeed will those plants which are raised by layers or cuttings, produce seeds, though those which come from seeds seldom fail. It may be propagated by laying down of the young shoots in the spring, which generally put out roots in three or four months; then they may be taken from the old plants, and each planted in a separate pot, and placed in the shade till they have taken new root, after which they may be placed with other hardy green-house plants till autumn, when they should be removed into the green-house, and afterward treated in the same way as *Myrtles*, and other green-house plants. If the tender cuttings of this are planted during any of the summer months, and plunged into a moderate hot-bed, shading them from the sun, they will take root, and afterward should be treated as the layers.

The seventeenth sort is an annual plant; this rises with a very slender twining stalk, four or five feet high, garnished with triangular leaves, which are pointed. The flowers grow in clusters, sitting close to the stalks, which are blue, and are succeeded by seeds like those of the fourth sort. This sort will not ripen seeds in *England*, unless the plants are brought forward on a hot-bed in the spring, and afterward placed in a glass case, where they may be defended from cold.

The eighteenth sort grows naturally in *Jamaica*. This is one of the most beautiful species of this genus, the flowers being very large, and of a fine Rose colour. It rises with a winding stalk, seven or eight feet high, garnished with heart-shaped leaves, ending in long points, sitting upon very long foot-stalks.

foot-stalks. The flowers also have long foot-stalks, each supporting two flowers, whose empalement is divided deeply into five parts; the seeds of this are large, and covered with a fine down. This is an annual plant, which is too tender to thrive in the open air in this country, so the seeds should be sown on a hot-bed in the spring, and the plants afterward treated in the same manner as is directed for the eighth sort.

The nineteenth sort grows naturally near the sea, at *Campeachy*. It hath strong, smooth, winding stalks, which send out roots at their joints, garnished with arrow-pointed leaves, whose ears (or lobes) are obtuse; the flowers are large, of a sulphur colour, and sit upon very long foot-stalks, which proceed from the side of the stalks, each supporting one flower, with a large swelling empalement; they are succeeded by large, smooth, oval capsules, having three cells, each including one large smooth seed. This is a perennial plant, whose stalks extend to a great distance, and put out roots at the joints, whereby it propagates in plenty, but it is too tender to thrive in *England*, unless it is preserved in a warm stove, where it requires more room, than can well be allowed to one plant. It must be treated in the same manner as the eighth sort.

The twentieth sort grows naturally in *Africa*; this rises with a slender winding stalk, five or six feet high, garnished with heart-shaped arrow-pointed leaves; the flowers stand on long slender foot-stalks, they are white, with purple bottoms. This may be treated in the same manner as the common great *Convolvulus*.

The twenty-first sort grows naturally in *Spain* and *Italy*. It is an annual plant, which rises about two feet high, with slender twining stalks, garnished with oval leaves. The flowers are small, and of a bluish colour; each foot-stalk supporting one flower, of little beauty, so is not often cultivated in gardens. If the seeds of this sort are permitted to scatter, the plants will rise in the spring, and require no other culture but to keep them clean from weeds; or if the seeds are sown in the spring, where the plants are to remain, they will flower in *June*, and the seeds will ripen in *August*.

The twenty-second sort grows naturally in *Sicily*, and also in the islands of the *Archipelago*; this hath a perennial root, which sends out many slender stiff stalks, twisting themselves round the neighbouring plants, and grow five or six feet high, garnished with leaves, which are divided into five or seven narrow lobes, and are soft like fatten, standing on short foot-stalks. The flowers are produced from the side of the stalks, upon long foot-stalks, which sustain two flowers of a pale Rose colour, with five stripes of a deeper red. This sort creeps at the root, so seldom produces seeds in *England*, but is propagated by the shoots taken from the old plants; the best time for parting and transplanting these plants, is about the beginning of *May*, when they may be taken out of the green-house, and exposed in the open air; but the young plants which are separated from the old ones, should be placed under a frame, and shaded from the sun till they have taken new root, after which they must be gradually hardened to bear the open air; but in autumn they must be placed in the green-house, and may be treated in the same way as the *Canary Convolvulus* beforementioned.

The twenty-third sort hath some appearance of the twenty-second, and hath been supposed to be the same species by some writers, but as I have cultivated both many years, and never have found either of them alter, so I make no doubt of their being distinct plants. This hath a perennial root like the former, which sends out many weak twining stalks, rising three or four feet high, twisting about the plants which stand near it, or about each other, and if they have no other support, fall to the ground; they are garnished

with leaves of different forms, some are shaped almost like those of *Betony*, being slightly cut on their edges, others are almost heart-shaped, and are deeply cut on the sides, and some are cut to the midrib; they have a shining appearance like fatten, and are soft to the touch, standing on short foot-stalks. The flowers are produced on the opposite side from the leaves, having very long foot-stalks, each sustaining two flowers of a pale Rose colour, very like those of the former species. It hath a perennial root, which sends out offsets, by which it is propagated in *England*, in the same manner as the last mentioned, and the plants must be treated in the same way.

The twenty-fourth sort grows naturally in *Portugal*, but hath been long cultivated in the flower gardens in *England* for ornament; this is usually titled *Convolvulus minor*, by the seedsmen and gardeners. It is an annual plant, which hath several thick herbaceous stalks, growing about two feet long, which do not twine like the other sorts, but decline toward the ground, upon which many of the lower branches lie prostrate; they are garnished with spear-shaped leaves, which sit close to the branches; the foot-stalks of the flowers come out just above the leaves at the same joint, and on the same side of the stalks, and are about two inches long, each sustaining one large open bell-shaped flower, which in some is of a fine blue colour, with a white bottom; in others they are pure white, and some are beautifully variegated with both colours. The white flowers are succeeded by white seeds, and the blue by dark coloured seeds, and this difference is pretty constant in both; but those plants with variegated flowers, have frequently plain flowers of both colours, intermixed with the striped; therefore the only method to continue the variegated sort, is to pull off the plain flowers when they appear, never suffering any of them to remain for seed.

This sort is propagated by seeds, which should be sown on the borders of the flower garden, where they are designed to remain, and when the plants come up, if the seeds grow, there should be but one or two left in each place. After which they will require no other culture, but to keep them clean from weeds.

The twenty-fifth sort grows naturally in *Italy* and *Sicily*; this hath a perennial root, which runs deep in the ground, from which arise two or three upright branching stalks, two or three feet high, garnished with narrow leaves about two inches long, which sit close to the stalks; the foot-stalks of the flower proceed from the same place; these are four or five inches long, each sustaining four or five flowers, of a pale Rose colour, which spread open almost flat. It flowers in *July* and *August*, and the stalks decay in autumn; but the roots will last several years, and if they are in a dry soil and warm situation, will abide through the winters very well without covering, and may be propagated by layers.

The twenty-sixth sort hath a perennial creeping root, from which arise several short branching stalks, about four inches high, garnished with spear-shaped silky leaves; the flowers are produced on the side, and at the top of the stalks, in small clusters, sitting close together; they are much smaller than those of the former sort, but are of a deeper Rose colour: it seldom produces seeds in *England*, but the roots propagate in plenty; it may be transplanted either in the spring or autumn. This is by some supposed to be the same as the last mentioned sort, but whoever has cultivated them, can have no doubt of their being different species.

The twenty-seventh sort grows naturally in *Italy*, *Sicily*, and the islands of the *Archipelago*; it rises with upright shrubby stalks about three feet high, closely garnished with blunt, spear-shaped, silky leaves, which are placed on every side the stalks; they are near two inches long, and a quarter broad

broad, rounding at their ends. The flowers are produced in clusters at the top of the stalks, sitting very close; they are of a pale Rose colour, and come out in *June* and *July*, but do not perfect seeds in *England*. This plant will live in the open air in mild winters, if it is planted in a light soil and a warm situation, but in hard winters it is sometimes destroyed; therefore some of the plants should be kept in pots, and sheltered under a common frame in winter, where they may enjoy the free air in mild weather, and be protected from the frost, and in summer placed abroad with other hardy exotick plants, where its fine silky leaves will make a pretty appearance. It may be propagated by laying down the branches, and also by cuttings.

The twenty eighth sort grows naturally in *Candia*, and several of the islands in the *Archipelago*; this hath a perennial root, which sends up several erect branching stalks about two feet high, which are garnished with very narrow-pointed leaves, sitting close to the stalks, which are hoary. The flowers come out singly on the side of the stalks, sitting very close to them, having scarce any foot-stalks; these are of a very pale bluish colour, and spread open almost to the bottom. This sort is propagated in the same manner as the twenty-fifth, and the plants require the same treatment.

The twenty-ninth sort grows naturally in both *Indies*; this is an annual plant, which sends out several weak stalks from the root, inclining to the ground, which are garnished with oval leaves, sitting close to the stalks; they are about the size of Chickweed leaves, but are hairy, and are placed alternate on the branches, the flowers are small, of a light blue, two growing upon each foot-stalk, they are succeeded by small round capsules divided into three cells, which contain the seeds.

This sort is very tender, so the seeds should be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a separate small pot, and plunged into a hot-bed, observing to screen them from the sun till they have taken fresh root; after which, they must be treated in the same manner as the other tender sorts before mentioned.

The thirtieth sort is used in medicine; this is styled *Soldanella*, and *Brassica marina*; it grows naturally on the sea beaches in many parts of *England*, but cannot be long preserved in a garden. It hath many small white stringy roots, which spread wide, and send out several weak trailing branches, which twine about the neighbouring plants, like the common Bindweed, garnished with kidney-shaped leaves, about the size of those of the lesser Celandine, standing upon long foot-stalks, and are placed alternate. The flowers are produced on the side of the branches, at each joint. These are shaped like those of the first sort, and are of a reddish purple colour; they appear in *July*, and are succeeded by round capsules having three cells, each containing one black seed; every part of the plant abounds with a milky juice.

The thirty-first sort grows naturally in the island of *Ceylon*; this is a perennial plant, having thick fleshy roots, which spread far in the ground, and abound with a milky juice, which flows out when the roots are broken or wounded, and soon hardens into a resinous substance, when exposed to the sun and air. From the root shoots forth many twining branches, which twist about each other, or the neighbouring plants, like the common Bindweed. They are garnished with heart-shaped leaves, which are soft to the touch, like those of the Marsh-mallow. The flowers are produced at the joints on the side of the stalks, several standing together on the same foot-stalk; they are white, and shaped like those of the common great Bindweed, and are succeeded by round capsules, having three cells, which contain two seeds in each.

The roots of this plant, which are used in medicine, are brought to us from *India*; it is titled Turpethum, or Turbith, in the shops.

This plant is tender, so will not live in the open air in *England*. It is propagated by seeds, which must be sown on a hot-bed, and, when the plants are fit to remove, they should be each planted in a separate pot, and plunged into a hot-bed of tanners bark, and screened from the sun till they have taken root, and afterward must be treated in the same manner as hath been directed for the eighth sort.

The thirty-second sort is the Jalap which is used in medicine. This grows naturally at *Haleppo*, in the *Spanish West-Indies*, situated between *La Vera Cruz* and *Mexico*. The root of this plant hath been long used in medicine, but it was not certainly known from what plant it was produced. The old title of this was *Mechoacana nigra*, but Father *Plumier* asserted, that it was the root of one species of *Marvel of Peru*; from whence *Tournefort* was induced to constitute a genus of that plant, under the title of *Jalapa*. But Mr. *Ray*, from better information, put it among the *Convolvuli*, and titled it, *Convolvulus Americanus*, *Jalapium dictus*. This was, by the late Dr. *Houssoun*, fully ascertained, who brought some of the roots of this plant from the *Spanish West-Indies* to *Jamaica*, where he planted them, with a design of cultivating the plants for use in that island, where they flourished, during his abode there: but, soon after he left the country, the person to whose care he committed them was so careless, as to suffer hogs to root them out of the ground, and destroy them, so that there was no remains of them left when he returned there; nor have I heard of this plant being introduced into any of the *British* islands since.

This hath a large root, of an oval form, which is full of a milky juice, from which come out many herbaceous twining stalks, rising eight or ten feet high, garnished with variable leaves, some of them being heart-shaped, others angular, and some oblong and pointed; they are smooth, and stand upon long foot-stalks; and from a drawing of the plant, made by a *Spaniard*, in the country where it grows naturally, who gave it to Dr. *Houssoun*, and is now in my possession, the flowers are shaped like those of the common Great Bindweed, each foot-stalk supporting one flower: but, as it is only a pencil drawing, so the colour is not expressed, therefore I can give no farther account of it.

As this plant is a native of a warm country, so it will not thrive in *England*, unless it is preserved in a warm stove: therefore the seeds must be sown on a hot-bed, and the plants put into pots, and plunged into a hot-bed of tanners bark, and treated in the same manner as the eighth sort, with this difference only, that, as this hath large, fleshy, succulent roots, so they should have but little water given them, especially in winter, lest it cause them to rot.

CONYZA. *Lin. Gen. Plant.* 854. Flea-bane.

The Characters are,

It hath a compound flower, made up of many hermaphrodite florets, which compose the disk; and female half florets, which form the rays; the hermaphrodite florets are funnel-shaped, and cut into five parts at the brim, and have each five short hairy stamina; in the bottom of each floret is situated a germen. The female half florets, or rays, are funnel-shaped, and cut into three parts at the top; these have a germen. The hermaphrodite and female florets are both succeeded by one oblong seed, crowned with down, sitting upon a plain receptacle, and are included in the empalement.

The Species are,

1. CONYZA foliis lanceolatis acutis, caule annuo corymbofo. *Hort. Cliff.* 405. Common greater Flea-bane.

2. *CONYZA foliis ovato oblongis, amplexicaulibus.* Hort. Cliff. 405. Pyrenean Flea-bane with a Primrose leaf.

3. *CONYZA foliis ovatis tomentosis, floribus confertis, pedunculis lateralibus terminalibusque.* Hort. Cliff. 405. Shrubby Flea-bane of Crete, with soft woolly leaves, which are very white.

4. *CONYZA foliis hastatis scabris, caule erecto ramofo, perenni, floribus corymbosis.* Yellow tree-like Flea-bane, with a trifid leaf.

The first sort grows naturally upon dry places, in several parts of *England*, so is seldom allowed a place in gardens. This is a biennial plant, which decays soon after the seeds are ripe; it hath several large oblong pointed leaves, growing near the ground, which are hairy; between these the stalks come out, which rise more than two feet high, and divide upward into several branches, which are garnished with smaller oblong leaves, standing alternate; at the ends of the stalks the flowers are produced in round bunches, which are of a dirty yellow colour; these are succeeded by oblong seeds, crowned with down.

The second sort grows naturally on the mountains in *Italy*, and is preserved in botanick gardens for the sake of variety: it hath a perennial root, but an annual stalk. From a thick fibrous root, arise many upright stalks, garnished with oblong oval leaves, which are rough, and embrace the stalks with their base; these have appendages running along the stalk, from one to the other, whereby the stalk is winged. The upper part of the stalks divide into many smaller branches, garnished with leaves of the same form as the other, but smaller, standing alternate. The branches are terminated by yellow flowers, growing in round bunches, and are succeeded by oblong seeds, crowned with down. This is propagated by seeds, which may be sown on a bed of light earth in the spring, and, when the plants come up, they should be thinned where they are too near, and kept clean from weeds; the following autumn they may be transplanted where they are designed to remain, and require no other care but to keep them clean from weeds.

The third grows naturally in *Crete*. This hath a short shrubby stalk, which in this country seldom rises more than six inches high, dividing into several short branches, which are closely garnished with oval woolly leaves, which are very white; from these branches arise the flower-stalks, which are woolly, and about nine inches high; these are garnished with small oval white leaves, placed alternate. The flowers are produced at the sides and end of the stalk, sometimes but one, at other times two, and sometimes three flowers standing on the same foot-stalk: they are of a dirty yellow colour, and rarely are succeeded by seeds in this country: so the plant is propagated here by slips, which, if taken from the old plants in *June*, and planted on an east-aspected border, and covered with hand glasses, will take root in six or eight weeks; when they have taken root, they should be gradually exposed to the open air. In autumn these should be carefully taken up, preserving the earth to their roots; some of them may be planted in pots, that they may be sheltered under a frame in the winter; and the others may be planted in a warm border of dry, poor earth, where they will endure the cold of our ordinary winters very well, and continue many years.

The fourth sort grows naturally in *Jamaica*. This is titled, by Sir *Hans Sloane*, *Virga aurea major, sc. Herba Doria folio sinuato hirsuto.* Cat. Jam. 125. It rises with a shrubby stalk, seven or eight feet high, dividing into several branches, which are cloathed with rough leaves, shaped like the point of a halbert, about four inches long. The flowers are produced in roundish bunches, at the extremity of the branches; they are yellow, and stand close together. These are succeeded by oblong seeds, crowned with down.

This plant is too tender to thrive in the open air in this country, therefore the seeds must be sown upon a hot-bed, and, when the plants are fit to remove, they must be each transplanted into a separate small pot, and plunged into a hot-bed, observing to screen them from the sun till they have taken new root; then they must have free air admitted to them every day, in proportion to the warmth of the season. As the plants advance in strength, so they must have a greater share of air; and, if the season is warm, they may be exposed to the open air for a few weeks in the heat of the summer, provided they are placed in a warm situation; but if the nights prove cold, or much wet should fall, they must be removed into shelter. If these plants are placed in a moderate stove in winter, they will thrive better than in greater heat; and in summer they should have a large share of air. With this management I have had the plants flower well, though they have not perfected seeds here.

COPAIBA, the Balsam of Capevi Tree.

The Characters are,

It hath a flower consisting of five leaves, which expands in form of a rose; it hath five short stamina. The germen is fixed in the centre of the flower, which afterward becomes a pod, containing one or two seeds, which are surrounded with a pulp of a yellow colour.

We know but one sort of this tree, which is,

COPAIBA folio subrotundo, flore rubro. The Balsam of Capevi, with a roundish leaf and a red flower.

This tree grows near a village called *Ayapel*, in the province of *Antiochi*, in the *Spanish West-Indies*, which is about ten days journey from *Carthagena*. There are great numbers of these trees in the woods about this village, which grow to the height of fifty or sixty feet. Some of these trees do not yield any of the balsam; those which do, are distinguished by a ridge which runs along their trunks. These trees are wounded in their center, and they place Calabash shells, or some other vessels, to the wounded part, to receive the balsam, which will all flow out in a short time. One of these trees will yield five or six gallons of balsam: but, though these trees will thrive well after being tapped, yet they never afford any more balsam.

The seeds of this tree were brought from the country of their growth by Mr. *Robert Millar*, surgeon, who sowed a part of them in *Jamaica*, which he informed me had succeeded very well: so that there were hopes to have had these trees propagated in great plenty, in a few years, in some of the *English* colonies; but the slothfulness of the inhabitants suffered them to perish, as they have the *Cinnamon* tree, and some other useful plants, which have been carried thither by curious persons.

There are not, at present, any of these trees in *Europe*, that I can learn: for those seeds which were sent over to *England*, were all destroyed by insects in their passage, so that not one succeeded in the several places where they were sown.

CORALLODENDRON. See *Erythrina*.

CORCHORUS. *Lin. Gen. Plant.* 596. *Tourn. Inst.* 259. Tab. 135. Jews Mallow.

The Characters are,

The flower hath five oblong blunt petals; it hath many hairy stamina, which are shorter than the petals; in the center is situated an oblong furrowed germen, which afterward becomes a cylindrical pod, having five cells, which are filled with angular-pointed seeds.

The Species are,

1. *CORCHORUS capsalis oblongis, ventricosus, foliorum infimis serraturis setaceis, reflexis.* *Lin. Flor. Zeyl.* 213. Common Jews Mallow.

2. *CORCHORUS*

2. *CORCHORUS foliis cordatis, serratis, capsulis oblongis, ventricosis, sulcatis.* Jews Mallow, with heart-shaped sawed leaves, and oblong, swelling, furrowed capsules.

3. *CORCHORUS capsulis subrotundis, depressis, rugosis.* Flor. Zeyl. 214. Jews Mallow with roundish depressed capsules, which are rough.

4. *CORCHORUS foliis ovato-cordatis crenatis, capsulis tetragonis, apicibus reflexis.* Jews Mallow with a yellow flower, and fruit like a Clove.

5. *CORCHORUS foliis lineari-lanceolatis, serratis, capsulis linearibus, compressis, bivalvibus.* American Jews Mallow, with narrower leaves and fruit.

The first species, *Rawolf* says, is sown in great plenty about *Aleppo*, as a pot-herb, the *Jews* boiling the leaves of this plant to eat with their meat. This he supposes to be the *Olus Judaicum* of *Avicenna*, and the *Corchorum* of *Pliny*.

This plant grows in the *East* and *West-Indies*, from both which places I have several times received the seeds. In the *East-Indies* the herb is used in the same manner as in the *Levant*, as I have been informed; but I do not hear that it is used by the inhabitants of *America*.

This is an annual plant, which rises about two feet high, dividing into several branches, garnished with leaves of different sizes and forms; some are spear-shaped, others are oval, and some almost heart-shaped; they are of a deep green, and slightly indented on their edges, having near their base two bristly segments, which are reflexed. They have very long slender foot-stalks, especially those which grow on the lower part of the branches. The flowers sit close on the opposite side of the branches to the leaves, coming out singly: they are composed of five small yellow petals, and a great number of stamina surrounding the oblong germen, which is situated in the center of the flower, and afterward turns to a rough swelling capsule, two inches long, ending in a point, opening in four cells, which are filled with angular greenish seeds.

The second sort grows naturally in several islands of the *West-Indies*. This is also an annual plant, which rises with a strong herbaceous stalk, two feet high, divided upward into two or three branches, which are garnished with heart-shaped leaves, sawed on their edges, standing upon long foot-stalks; and between these are several leaves, nearly of the same form, sitting close to the branches. The flowers come out singly on the side of the branches, as the other, which are shaped like them, and are succeeded by longer swelling pods, which are rough, and have four longitudinal furrows; these open into four parts at the top, and contain four rows of angular seeds.

The third sort grows naturally in both *Indies*. This is also an annual plant, which rises with a slender herbaceous stalk, about three feet high, sending out several weak branches, which are garnished at each joint by one leaf of an oblong heart-shape, ending in a long acute point, and are sawed on their edges, standing upon short foot-stalks, but have no small leaves between. The flowers come out singly on the side of the branches, to which they sit very close; they are smaller than those of the former sorts, and are succeeded by short roundish seed vessels, which are rough, and flatted at the top, having six cells, filled with small angular seeds.

The fourth sort is also a native of both *Indies*. It is an annual plant, which rises about two feet high, dividing into small branches, garnished with oval heart-shaped leaves, crenated on their edges. The flowers of this are very small, of a pale yellow, and are succeeded by swelling, rough, four-cornered seed vessels, about an inch long, flatted at the top, where there are four horns, which are reflexed; so that these have some resemblance in shape to the Clove.

The seeds of the fifth sort were sent me from *Cartbagena*, where the plant grows naturally. This rises about three feet high, sending out several weak side branches, garnished with long narrow leaves, which are sawed on their edges, sitting close to the branches. The flowers are small, of a pale yellow, and come out on the side of the branches. These are succeeded by very narrow compressed pods, near two inches long, opening with two valves, and filled with small angular seeds.

All these plants are too tender to thrive in *England* in the open air; therefore their seeds must be sown on a hot-bed in the spring, and, when the plants are come up fit to remove, they should be transplanted on a fresh hot-bed, to bring the plants forward. After the plants are rooted in the new hot-bed, they must have free air admitted to them every day, for they must not be drawn up weak; and, when they have obtained strength, they should be transplanted each into a separate pot, and plunged into a hot-bed, observing to shade them from the sun till they have taken root; in *June* they should be gradually inured to the open air: part of them may be shaken out of the pots, and planted in a warm border, where, if the season proves warm, they will flower, and perfect their seeds; but, as these will sometimes fail, so it will be proper to put one or two plants of each sort into pots, which should be placed in a glass case, where they may be screened from bad weather, and from these good seeds may always be obtained.

CORDIA. Plum. Nov. Gen. 13. Tab. 14. Sebesten.

The Characters are,

The flower hath one funnel-shaped petal, whose tube is the length of the empalement; the top is divided into four, five, or six parts. It hath five stamina, and in the center a roundish pointed germen, which afterwards becomes a dry berry, which is globular and pointed, fastened to the empalement, inclosing a furrowed nut with two cells.

The Species are,

1. *CORDIA foliis oblongo ovatis, repandis, scabris.* Lin. Sp. Plant. 190. *Cordia* with oblong, oval, rough leaves, turning backward.

2. *CORDIA foliis subovatis serrato dentatis.* Hort. Cliff. 63. The cultivated Sebesten.

3. *CORDIA foliis ovatis, integerrimis.* Lin. Sp. Plant. 191. *Cordia* with oval entire leaves.

The first sort grows naturally in several islands in the *West-Indies*, where it rises with many shrubby stalks, eight or nine feet high, which are garnished toward the top with oblong, oval, rough leaves, standing alternate, on short foot-stalks; they are of a deep green on their upper side. The flowers terminate the branches, growing in large clusters upon branching foot-stalks, some sustaining one, others two, and some have three flowers, which are large, funnel-shaped, having long tubes, which spread open at the top, where it is divided into five obtuse segments: they are of a beautiful scarlet, so make a fine appearance.

The second sort is, by most botanists, believed to be the *Myxa* of *Cæsalpinus*, which is the true Sebesten of the shops; the fruit of which was formerly used in medicine, but of late years has been seldom brought to *England*. This is called *Affyrian Plumb*, from the country where it naturally grows; it rises to the height of our common *Plumb* trees in its native country, but is very rare in *Europe* at present.

The third sort was discovered by *Father Plumier*, in some of the *French* islands in *America*. This sort grows to the height of eighteen or twenty feet, in the natural places where it is found wild. It hath winged leaves, which are large, entire, and smooth; but it hath not yet flowered in *England*, so I can give no farther account of it.

These plants, being natives of warm countries, are too tender to live through the winter in *England*, unless they

are preserved in a stove. They are all propagated by seeds, which must be procured from the countries of their natural growth. These must be sown in small pots, which should be plunged into a good hot-bed of tanners bark in the spring; if the seeds are fresh and good, the plants will begin to appear in six weeks or two months after. These must be brought forward in the hot-bed, by being treated as other tender exotick plants, observing frequently to water them, as they are aquatick plants; in summer they should be gradually hardened, and as they obtain strength, will become more hardy; but, during the two first winters, it will be proper to plunge them into the tan bed in the stove, but, when they begin to have woody stems, they may be placed on shelves, in a dry stove, where, if they are kept in a moderate degree of heat, they may be preserved very well (especially the first sort) which is somewhat harder than the others.

These plants produce very fine flowers, especially the first sort, which has large tufts of scarlet flowers, produced at the extremity of the branches, after the same manner as the Oleander, or Rose bay; but these flowers are much larger, and of a finer colour.

A small piece of the wood of this tree, being put on a pan of lighted coals, will send forth a most agreeable odour, which will perfume a whole house.

COREOPSIS. *Lin. Gen. Pl.* 879. Tickseed.

The Characters are,

The common empalement of the flower is double; the disk of the flower is composed of many hermaphrodite florets, which are tubular; these have each five hairy stamina; in their center is situated a compressed germen, with two horns, which afterward becomes a single orbicular seed. The border, or rays, is composed of eight female florets, which are tongue-shaped, indented in five parts; these have no stamina, but a germen like the other, and are abortive.

The Species are,

1. COREOPSIS *foliis lanceolatis, ferratis, alternis, petiolatis decurrentibus.* *Hort. Upsal.* 270. Tickseed with spear-shaped, sawed leaves, placed alternate, and are decurrent, and have foot-stalks.

2. COREOPSIS *foliis linearibus, integerrimis.* *Gron. Virg.* 131. Tickseed with very narrow entire leaves.

3. COREOPSIS *foliis lanceolatis, integerrimis.* *Lin. Sp. Pl.* 908. Tickseed with spear-shaped leaves, which are entire.

4. COREOPSIS *foliis decomposito-pinnatis, linearibus.* *Lin. Sp. Pl.* 907. Tickseed with decomposed, winged, narrow leaves.

5. COREOPSIS *foliis subternatis, integerrimis.* *Hort. Upsal.* 269. Tickseed with leaves growing by threes, which are entire.

The first sort grows naturally in most parts of *North America*. This hath a perennial root, and an annual stalk; the stalks are strong, herbaceous, and rise to the height of eight or ten feet, garnished with spear-shaped leaves, sawed on their edges, which are from three to four inches long, and one broad in the middle, placed alternate on every side the stalks, with a border, or wing, running from one to the other, the whole length of the stalk. The flowers grow at the top of the stalks, forming a sort of corymbus, each foot-stalk sustaining one, two, or three yellow flowers, shaped like Sun-flowers, but much smaller. It is a very hardy plant, and may be propagated in plenty, by parting of the roots in autumn, when the stalks begin to decay. It will thrive in almost every soil and situation.

The second sort is a plant of humbler growth, seldom rising above two feet high. The stalks grow erect, and the leaves are very long, narrow, entire, and rough. The flowers are produced at the extremity of the shoots, which are of a fine yellow colour, having a dark purple middle,

and are of long duration. The plants commonly begin to flower the middle of *July*, and continue till *October*, and, if the season proves favourable, some flowers will continue till *November*, which makes it merit a place in every good garden. The seeds of this sort have been frequently sent to *England* from *Maryland*, where the plants grow wild; but they are biennial plants with us, their roots having as yet continued but two years; nor do they perfect their seeds in *England*, so that at present the plants are very rare in the *English* gardens.

The third sort is an annual plant. The seeds of this were brought from *Carolina* by Mr. *Catesby*, in the year 1726. It hath an upright stalk, garnished with smooth, narrow, spear-shaped leaves, placed opposite, which are entire; from the wings of the leaves come out the foot-stalks of the flowers, which stand opposite, and are erect; the lower part of these have one or two pair of very narrow leaves, but the upper is naked, and terminated by one large yellow flower, whose border, or rays, are deeply cut into several segments; these are succeeded by flat winged seeds, which, when ripe, roll up; the naked foot-stalks of these flowers are more than a foot long. This must be sown upon a gentle hot-bed in the spring, and, when the plants are fit to transplant, they should be each planted into a separate small pot, and plunged into a fresh hot-bed, to bring them forward; and in *June* they should be inured, by degrees, to the open air, and afterward some of them may be shaken out of the pots, and planted in a warm border, where, if the season is good, they will flower in the middle of *July*, and ripen their seeds the beginning of *September*.

The fourth sort hath a perennial root, which sends up many stiff angular stalks, which rise upward of three feet high, garnished at each joint with decomposed winged leaves, standing opposite; these are very narrow, and entire. The branches also come out by pairs opposite, as do also the foot-stalks of the flowers, which are long, slender, and each terminated by a single flower, of a bright yellow, the rays, or border, being oval and entire; the disk, or middle, is of a dark purple colour. This grows naturally in *Maryland* and *Philadelphia*. It is propagated by parting of the roots, in the same manner as the first sort, and delights in a light loamy earth, and a sunny exposure.

The fifth sort hath a perennial root, and an annual stalk. This grows naturally in many parts of *North America*. The stalks of this are strong, round, and smooth, rising six or seven feet high, and are garnished at each joint with some trifoliate leaves, which stand opposite. The flowers are produced in bunches at the top of the stalks, standing upon long foot-stalks; they are of a pale yellow, with a dark purple disk. This sort is propagated by parting of the roots, in the same manner as the first, but requires a better soil and position.

CORIANDRUM. *Lin. Gen. Plant.* 318. Coriander.

The Characters are,

It is a plant with an umbellated flower; the proper empalement is divided into five parts; the rays of the principal umbel are difform; the hermaphrodite flowers, which form the disk, have five equal heart-shaped petals; they have each five stamina. The germen, which is situated under the flower, afterward becomes a spherical fruit, divided into two parts, each having a hemispherical concave seed.

The Species are,

1. CORIANDRUM *fructibus globosis.* *Hort. Cliff.* 100. Great Coriander.

2. CORIANDRUM *fructibus didymis.* *Hort. Cliff.* 100. Smaller testiculated Coriander.

The first of these species is the most common kind, which is cultivated in the *European* gardens and fields for the seeds, which are used in medicine. The second sort is less com-

mon than the first, and is seldom found but in botanick gardens in these parts of *Europe*. These plants grow naturally in the south of *France*, in *Spain* and *Italy*; but the first sort has been long cultivated in the gardens and fields, though at present there is not near so much of it sown in *England* as was some years past.

They are propagated by sowing their seeds in the autumn, in an open situation, in a bed of good fresh earth, and, when the plants are come up, they should be hoed out to about four inches distance every way, clearing them from weeds; by which management these plants will grow strong, and produce a greater quantity of good seeds. The first sort was formerly cultivated in the gardens as a salad herb.

CORIARIA. *Lin. Gen. Plant.* 458. Myrtle-leaved Sumach, *vulgo*.

The Characters are,

It is male and female in different plants; the male flowers have five leaves, which are joined to the empalement, and have ten slender stamina; the female flowers have the same number of petals; and in the center are placed five pointals, which turn to a berry, inclosing five kidney-shaped seeds.

The Species are,

1. **CORIARIA foliis ovato oblongis.** *Hort. Upsal.* 299. Male Myrtle-leaved Sumach.

2. **CORIARIA vulgaris fœmina.** *Lin. Hort. Cliff.* Female Myrtle-leaved Sumach.

The sort with male flowers is the most common in *England*, the other is very rarely seen in any of the gardens. These grow wild, in great plenty, about *Montpelier* in *France*, where it is used for tanning of leather; and, from this use, has been titled by the botanists, *Rhus coriariorum*, i. e. Tan-ners Sumach.

These shrubs seldom grow more than three or four feet high, and, as they creep at the root, they send forth many stems, whereby they form a thicket, so may be planted to fill up vacancies in wilderness quarters; but they are improper for small gardens, where they will take up too much room, and, as there is no great beauty in the flowers, they are only admitted for variety.

It may be propagated plentifully from the suckers, which are produced from the creeping roots in great abundance; these should be taken off in autumn, and planted into a nursery, to form good roots, where they may continue one or two years, and then must be removed to the places where they are to remain.

CORINDUM. See *Cardiospermum*.

CORIS. *Lin. Gen. Plant.* 216. We have no English name for this plant.

The Characters are,

The flower hath one ringent petal, whose tube is the length of the empalement, spread open at the top, where it is divided into five oblong segments; it hath five bristly stamina. In the center is situated a round germen; the empalement afterward becomes a globular capsule, having five valves, inclosing several small oval seeds.

We have but one Species of this plant, *viz.*

CORIS. *Hort. Cliff.* 68. Blue maritime Coris.

There are two other varieties of this plant, one with a red, and the other a white flower; but these are only accidental varieties, arising from the same seeds.

These plants grow wild about *Montpelier*, and in most places in the south of *France*; they seldom grow above six inches high, and spread near the surface of the ground, like heath; and in *June*, when they are full of flowers, they make a very pretty appearance.

They may be propagated by sowing of their seeds on a bed of fresh earth, and, when the plants are about an inch high, they should be transplanted, some of them into pots,

that they may be sheltered in winter, and the others into a warm border, where they will endure the cold of our ordinary winters very well, but in severe frosts they are generally destroyed: for which reason, it will be proper to have some plants of each sort in pots, which may be put under a common hot-bed frame in winter, where they may be covered in frosty weather, but, when it is mild, they should have a great share of free air. These plants rarely producing ripe seeds in *England*, should be increased from slips and cuttings, which will take root if planted in *August*, on a very gentle hot-bed, and shaded from the sun, and duly watered.

CORISPERMUM. *Lin. Gen. Plant.* 12. Tickseed.

The Characters are,

The flower hath no empalement; it hath two compressed incurved petals; it hath one, two, or three stamina, and a compressed pointed germen, which afterward becomes one oval compressed seed, with an acute border.

The Species are,

1. **CORISPERMUM floribus lateralibus.** *Hort. Upsal.* 2. Tickseed with flowers on the side of the stalks.

2. **CORISPERMUM spicis squarrosis.** *Hort. Upsal.* 3. Tickseed with rough spikes.

These plants are preserved in botanick gardens for the sake of variety, but they have no beauty, so are seldom cultivated in other gardens.

The first sort is an annual plant, which, if suffered to scatter its seeds, the ground will be plentifully stocked with the plants, which will require no other care, but to prevent the weeds from over growing them.

The second will not grow but in marshy places, where there is standing water; over the surface of which this plant will soon extend, when once it is established.

CORK-TREE. See *Quercus*.

CORN-FLAG. See *Gladiolus*.

CORN-MARIGOLD. See *Chrysanthemum*.

CORN-SALLAD. See *Valerianella*.

CORNUS. *Lin. Gen. Plant.* 139. The Cornelian Cherry.

The Characters are,

It hath many flowers, which are included in one common, four-leaved, coloured involucre; the flowers have four plain petals, and four erect stamina, which are longer than the petals; the round germen situated below the empalement, afterward becomes an oval, or roundish berry, inclosing a nut with two cells, having an oblong kernel.

The Species are,

1. **CORNUS arborea, cynis nudis.** *it. W-goth. Lin. Sp. Plant.* 117. Female Dogwood.

2. **CORNUS arborea, umbellis involucre æquantibus.** *Hort. Cliff.* 38. Male Cornel, or Cornelian Cherry tree.

3. **CORNUS arborea, involucre maximo, foliolis obversè cordatis.** *Hort. Cliff.* 38. Male *Virginia* Dogwood, with flowers collected into a corymbus.

4. **CORNUS arborea, foliis lanceolatis, acutis, nervosis, floribus corymbosis terminalibus.** Female *Virginia* Dogwood, with a narrower leaf.

5. **CORNUS arborea foliis oblongo ovatis, nervosis, infernè albis, floribus corymbosis terminalibus.** Wild *Tartarian* Dogwood, with a white fruit.

6. **CORNUS herbacea ramis binis.** *Fl. Lapp.* 55. Low herbaceous Dogwood, called Dwarf Honeyfuckle.

The first of these trees is very common in the hedges in most parts of *England*, and is seldom preserved in gardens. This tree is called *Virga sanguinea*, from the young shoots being of a fine red colour in winter.

The second sort was formerly very common in the *English* gardens, where it was propagated for its fruit, which by many people was preserved to make tarts. Of this there are two or three varieties, which differ in the colour of their

their fruit; but that with the red fruit is the most common in *England*.

As the fruit of this tree is not at present much esteemed, the nursery-men about *London* propagate it only as a flowering shrub, and is by some people valued for coming so early to flower: for, if the season is mild, the flowers will appear by the beginning of *February*; and though there is no great beauty in the flowers, yet as they are generally produced in plenty, at a season when few other flowers appear, a few plants of them may be admitted for variety. The fruit of this tree is seldom ripe before *September*.

The third sort is found growing naturally in all the northern parts of *America*. This will grow to the same height with our common female Dogberry, and make a much better appearance. It is now very common in the nurseries, where it is known by the name of *Virginia Dogwood*. This is well garnished with leaves, which are larger than either of the other sorts, but is not so plentiful of flowers, nor do the plants produce berries in *England*, though the shrubs are as hardy as the other.

The sixth sort grows upon *Cheviot* hills in *Northumberland*, and also upon the *Alps*, and other mountainous places in the northern countries, but is very difficult to preserve in gardens. The only method is, to remove the plants from the places of their natural growth, with good balls of earth to their roots, and plant them in a moist shady situation, where they are not annoyed by the roots of other plants. In such a situation they may be preserved two or three years, but it rarely happens that they will continue longer.

All the sorts of Dogwood may be propagated by their seeds, which, if sown in autumn soon after they are ripe, will most of them come up the following spring; but, if the seeds are not sown in autumn, they will lie a year in the ground before the plants will appear; and, when the season proves dry, they will sometimes remain two years in the ground: therefore the place should not be disturbed where these seeds are sown under two years, if the plants should not come up sooner. When the plants are come up, they should be duly watered in dry weather, and kept clean from weeds, and, the autumn following, they may be removed, and planted in beds in the nursery, where they may remain two years, by which time they will be fit to transplant where they are to remain for good.

They are also propagated by suckers, and laying down of the branches. Most of the sorts produce plenty of suckers, especially when they are planted on a moist soil, which may be taken off from the old plants in autumn, and planted into a nursery for a year or two, and then may be transplanted into the places where they are to remain; but those plants which are propagated by suckers, rarely have so good roots as those which are propagated by layers.

CORNUTIA. *Plum. Nov. Gen.* 17. *Lin. Gen. Plant.* 684.

The Characters are,

The flower has one petal, having a cylindrical tube, which is divided into four parts at the top; it hath four stamina; two of these are longer than the tube, the other are shorter; in the center is situated the roundish germen, which afterward becomes a globular berry, sitting upon the empalment, inclosing several kidney-shaped seeds.

We have but one Species of this plant,

CORNUTIA. *Hort. Cliff.* 319. Cornutia with a blue pyramidal flower and hoary leaves.

This plant is found in plenty in several of the islands in the *West-Indies*, at *Campeachy*, and at *La Vera Cruz*. It grows to the height of ten or twelve feet, with rude branches; the leaves are placed opposite. The flowers are produced in spikes, at the end of the branches, which are of a fine blue colour; these usually appear in au-

turn, and sometimes will remain in beauty for two months or more.

It is propagated either by seeds or cuttings. The seeds should be sown early in the spring on a hot-bed, and, when the plants are come up, they should be transplanted each into a separate halfpenny pot, and plunged into a hot-bed of tanners bark, observing to shade them until they have taken root; when the plants have filled these pots with their roots, they should be shifted into others of a larger size, and plunged into a hot-bed again, where they should be continued till *October*, when they must be removed into the bark stove, and plunged into the tan, for otherwise it will be very difficult to preserve them through the winter: but a moderate share of heat will agree better with them than a very warm stove. The third year from seed these plants will flower, when they will make a very fine appearance in the stove; but they never perfect their seeds in *England*.

The cuttings should be planted into pots, and plunged into a bark bed, observing to shade and water them; they will take root, and must be afterwards treated as the seedling plants.

CORONA IMPERIALIS. See *Fritillaria*.

CORONA SOLIS. See *Helianthus*.

CORONILLA. Jointed-podded *Colutea*.

The Characters are,

It hath a butterfly flower, with nine stamina, which are united, and one standing single, terminated by small summits; in the center is situated an oblong taper germen, which afterward becomes a taper-jointed pod, inclosing oblong seeds.

The Species are,

1. CORONILLA fruticosa, foliolis emarginatis, extimo minore. Shrubby maritime Coronilla, with a sea-green leaf.

2. CORONILLA fruticosa foliolis undenis, extimo majore. *Lin. Sp. Plant.* 743. Shrubby silvery Coronilla of *Crete*.

3. CORONILLA fruticosa stipulis subrotundis. *Lin. Sp. Plant.* 742. Shrubby Spanish Coronilla.

4. CORONILLA fruticosa enneaphylla, foliolis emarginatis, stipulis majoribus subrotundis. Coronilla with thicker pods and seeds.

5. CORONILLA foliolis plurimis, ovatis, caule suffruticoso declinato, pedunculis longioribus. Smallest Coronilla.

6. CORONILLA herbacea, leguminibus erectis, teretibus, torosis, numerosis, foliis glabris. *Hort. Cliff.* 363. Herbaceous Coronilla, with a various coloured flower.

7. CORONILLA herbacea, leguminibus quinis, erectis, teretibus, articulatis. *Prod. Leyd.* 387. Herbaceous Coronilla of *Crete*, with a small purplish flower.

The first sort is an humble shrub, which seldom rises more than two feet high, with a shrubby branching stalk, garnished closely with winged leaves, each being generally composed of five pair of small leaves, or lobes, terminated by an odd one; these are narrow at their base, and broad at the top, and of a sea-green colour. The flowers are produced on slender foot-stalks from the wings of the leaves, on the upper part of the branches, several standing together in a roundish bunch; they are of the butterfly, or Pea-bloom kind, of a bright yellow colour, having a very strong odour, which to some persons is agreeable, but to others the contrary.

This plant is propagated by sowing the seeds in the spring, either upon a gentle hot-bed, or on a warm border of light earth; when the plants are come up about two inches high, they should be transplanted either into pots, or in a bed of fresh earth, at about four or five inches distance every way, where they may remain until they have obtained strength enough to plant out for good, which should be either into pots filled with good fresh earth, or in a warm-situated border; in which, if the winter is not too severe,

they will abide very well, provided they are in a dry soil.

The second sort is a shrub of the same size with the first, from which it differs in the number of small leaves, or lobes, on each midrib, these having nine or eleven; they are of a silver colour, but the flowers and pods are the same as the former, and the plants requires the same treatment.

The third sort is a shrubby plant, which will rise five feet high, but the stalks are weak, so must be supported; these are garnished with many winged leaves, composed of small oval lobes, placed along the midrib by pairs, ending in an odd one. The flowers stand upon long slender foot-stalks, which arise from the ends of the branches; they are yellow, and grow together in close bunches. This sort, if sheltered from hard frosts, will flower all the winter.

This is a perennial plant, which is propagated by seeds; they may be sown on a bed of light earth in April, and, when the plants are fit to transplant, they should be planted in a warm border near a wall, a pale, or reed hedge, observing to shade them from the sun till they have taken fresh root; after they are well rooted, they will require no other culture but to keep them clean from weeds, and to support their branches, otherwise they will fall on the ground; the next year they will flower, and if they are on a dry soil, and in a warm situation, they will continue many years.

The fourth sort is nearly like the first, but hath fewer pinnæ on each midrib; the flowers are larger, and have little scent; the pods and seeds are much larger, and the plants are not quite so hardy. It requires the same treatment as the first; but in winter the plants should be sheltered, otherwise hard frosts will destroy them.

The fifth sort is a low trailing plant, with shrubby stalks, which spread near the ground, and are garnished with winged leaves, composed of many pair of small leaves placed along the midrib, terminated by an odd one; these are oval, and of a bright green; the flowers stand upon long foot-stalks, in close bunches; they are yellow, and without scent. This is propagated by seeds, in the same manner as the other sorts, and requires the same treatment.

The sixth sort dies to the ground every winter, but rises again the succeeding spring; the shoots rise to the height of five or six feet, where they have support, otherwise they trail on the ground, and are garnished with winged leaves, composed of several oblong small pinnæ, which are sometimes placed by pairs, and at other times are alternate, ending in a single one; they are of a deep green. The flowers come out on long foot-stalks from the wings of the leaves, many growing together in round bunches; they are variable, from a deep to a light purple, mixed with white, and are succeeded by slender pods, from two to three inches long, standing erect. The roots of this plant creep very far under ground, by which the plant increases greatly; which, when permitted to remain unmoved for two or three years, will spread and overbear whatever plants grow near it; for which reason the roots should be confined, and should be planted at a distance from any other plants: they will grow in almost any soil and situation, but thrive best in a warm sunny exposure, in which the flowers will also be much fairer, and in greater quantities. This plant was formerly cultivated to feed cattle.

The seventh sort hath an herbaceous stalk, which rises two feet high, garnished with winged leaves, composed of six pair of small leaves, placed along the midrib, which is terminated by an odd one; these are larger than those of the sixth sort, and broader at the top. The foot-stalks of the flowers come out from the the sides of the stalks, but are shorter than those of the sixth sort, and sustain smaller

heads of flowers, which are succeeded by taper-jointed pods, near two inches long.

This is an annual plant, which grows naturally in the *Archipelago*, from whence *Tournefort* sent the seeds to the royal garden at *Paris*. The seeds of this sort should be sown on a bed of light earth in the spring, where the plants are designed to remain, and, when the plants come up, they should be thinned where they are too close, and afterward kept clean from weeds, which is all the culture they will require: in *June* they will flower, and the seeds ripen in autumn.

CORONOPUS. See *Plantago*.

CORTUSA. *Lin. Gen. Plant.* 181. Bear's-ear Sanicle.

The Characters are,

The flower hath one wheel-shaped petal, cut into five parts at the brim, having five prominent tubercles at the base; it hath five short obtuse stamina; in the center is fixed an oval germen, which afterward becomes an oval, oblong, pointed capsule, having two longitudinal furrows, and one cell, opening with two valves, and filled with small oblong seeds.

The Species are,

1. CORTUSA *calycibus corollâ brevioribus*. *Lin. Sp. Plant.* 144. Bear's-ear Sanicle with an empalement shorter than the petal.

2. CORTUSA *calycibus corollam excedentibus*. *Amæn. Acad.* 2. p. 340. Bear's-ear Sanicle with an empalement longer than the petal.

The first sort grows naturally on the *Alps*, the mountains in *Austria*, and in *Siberia*. This plant sends out many oblong smooth leaves, which are a little indented on the edges, and form a sort of head, like the *Auricula*. The foot-stalks of the flowers come out in the center of the leaves; these rise about four inches high, and support an umbel of flowers, each sitting on a slender, separate, short foot-stalk; they are of a flesh colour, and spread open like those of *Auricula*; this plant is with great difficulty kept in a garden; the only method by which I could ever preserve it, has been by planting the plants in pots, covering the earth with moss, and placing them in a shady situation, where they were duly watered in dry weather; in this place they constantly remained both summer and winter, for the cold will not destroy them; the earth for this plant should be light, and not rich. As this very rarely produces any seeds in *England*, the only method to propagate it is, by parting the roots in the same manner as is practised for *Auriculas*; the best time for this is about *Michaelmas*, soon after which the leaves decay.

The second sort is very like the first, but the flowers are much less, and their empalements are larger; this grows naturally in *Siberia*, but is with great difficulty kept in a garden.

CORYLUS. *Lin. Gen. Plant.* 953. The Hazel, or Nut Tree.

The Characters are,

It hath male and female flowers growing at remote distances on the same tree. The male flowers are produced in long scaly katkins, having no petals, but eight short stamina fastened to the side of the scale; the female flowers are included in the future bud, sitting close to the branches; these have no petals, but a small round germen occupies the center; which afterward becomes an oval nut, shaved at the base, and compressed at the top, ending in a point.

The Species are,

1. CORYLUS *stipulis ovatis obtusis*. *Hort. Cliff.* 448. Wild Hazel Nut.

2. CORYLUS *stipulis oblongis, obtusis, ramis erectioribus*. The Filbert.

3. CORYLUS *stipulis linearibus acutis*. *Hort. Cliff.* 448. Byzantine Nut.

The first of these trees is common in many woods in *England*, from whence the fruit is gathered in plenty, and brought to the *London* markets by the country people. This is seldom planted in gardens; it delights to grow on a moist strong soil, and may be plentifully increased by suckers from the old plants, or by laying down their branches, which, in one year's time, will take sufficient root for transplanting; and these will be much handsomer, and better rooted plants, than suckers, and will greatly outgrow them, especially while young.

The second sort is by many supposed to be only a semi-nal variety from the first, which hath been improved by culture; but this is very doubtful, for I have several times propagated both from the nuts, but never have found them vary from one to the other, though they have altered in the size and colour of their fruit, from the sorts which were sown; but as the shrubs of this grow more erect than those of the other, and the stipulæ are different in their shape, so I have enumerated it as a distinct sort; of this there are the red and white Filberts, both which are so well known, as to need no description.

The third sort grows naturally near *Constantinople*; the nuts of this are large, roundish, and in shape like those of the common Hazel, but are more than twice their size; the cups in which the nuts grow are very large, so as almost to cover the nut, and is deeply cut at the brim. This sort is not common in *England*, but I take those large nuts, which are annually imported from *Barcelona* in *Spain*, to be of the same kind, the nuts being so like, as not to be distinguished when out of their cups; and those of the *Spanish* sort come over naked, so I cannot with certainty say how they essentially differ.

All these sorts may be propagated by layers or sowing their nuts in *February*, which, in order to preserve them good, should be kept in sand in a moist cellar, where the vermin cannot come at them to destroy them; nor should the external air be excluded from them, which would occasion their growing mouldy.

COSTUS. *Lin. Gen. Plant.* 3.

The Characters are,

It hath a simple spadix and spathe, with a small empalement, divided into three parts, sitting on the germen; the flower hath three concave petals, which are erect and equal, with a large oblong nectarium of one leaf, having two lips; the upper is shorter, and turns to a stamen, this is fastened to the upper lip of the nectarium; the germen is situated within the receptacle of the flower, and afterward becomes a roundish capsule with three cells, containing several triangular seeds.

We have but one sort of this plant, viz.

COSTUS. *Hort. Cliff.* 2. *Arabian Costus.*

This hath a fleshy jointed root, like that of Ginger, which propagates under the surface as that doth; from which arise many round taper herbaceous stalks, garnished with oblong smooth leaves, embracing them like those of the Reed; these stalks rise two feet high, and out of the center, the club, or head of flowers is produced, which is two inches long, the thickness of a man's finger, and blunt at the top, composed of several leafy scales, out of which the flowers come; these have but one thin white petal, which is of short duration, seldom continuing longer than one day before it fades, and is never succeeded by seeds in this country. The time of its flowering is uncertain, for sometimes it flowers late in the winter, and at other times it has flowered in summer, so is not constant to any season in *England*.

This is propagated by parting of the roots; the best time for doing this is in the spring, before the roots put out new stalks; the roots must not be divided too small, because that will prevent their flowering; they should be planted in pots, and plunged into the tan bed in the stove, where they

should constantly remain, and may be treated in the same manner as the Ginger.

The roots of this plant were formerly imported from *India*, and were much used in medicine; but of late years they have not been regarded, the roots of Ginger being generally substituted for these.

COTINUS. See Rhus.

COTONEA MALUS. See Cydonia.

COTONEASTER. See Mespilus.

COTULA. *Lin. Gen. Plant.* 868. Mayweed.

The Characters are,

It hath a flower composed of hermaphrodite florets in the disk, and female half florets, which form the rays, included in one common convex empalement. The hermaphrodite florets are tubular, cut into four unequal parts at the top, and have four small stamina, with a germen in the center, which becomes one small oval angular seed; the female half florets have an oval compressed germen, but have no stamina, and are succeeded by single heart-shaped seeds, plain on one side, and convex on the other.

The Species are,

1. COTULA foliis pinnato-multifidis, corollis radio destitutis. *Hort. Cliff.* 417. Yellow Chamomile with heads having no rays.

2. COTULA receptaculis subtus inflatis, turbinatis, *Hort. Cliff.* 417. African Mayweed with an elegant empalement.

3. COTULA foliis lanceolato-linearibus, amplexicaulibus pinnatifidis. *Hort. Cliff.* 417. Smaller foreign Corn Marigold without rays, having the appearance of naked Chamomile.

The first sort grows naturally in *Spain*, *Italy*, and the *Archipelago*; this is an annual plant, which rises with a branching stalk, half a foot high, garnished with leaves which are finely divided like those of Chamomile; the flowers are produced singly at the end of the branches, which are very like those of the naked Chamomile, but the heads rise higher in the middle like a pyramid. If the seeds of this sort are permitted to scatter, the plant will come up in the spring, and require no other care, but to keep them clean from weeds, and thin the plants where they are too close.

The second sort grows naturally at the *Cape of Good Hope*; this is an annual plant, sending out many branching stalks from the root, which spread on the ground, garnished with very fine divided leaves, covered with a lanugo, or cotton; the flowers are produced singly upon long foot-stalks, arising from the side of the branches; these have a narrow border of white rays, with a pale yellow disk: this sort must be raised on a moderate hot bed in the spring, and when the plants have obtained strength, they may be transplanted into a warm border, where they will ripen their seeds very well.

The third sort is an annual plant, which sends out trailing stalks about six inches long, garnished with succulent leaves, in shape like those of Buckhorn Plantain; the flowers grow from the divisions of the stalks, upon short weak foot-stalks, being destitute of rays; they are of a sulphur colour. If the seeds of this sort are sown on a warm border, where the plants are to remain, they will require no other culture, but to keep them clean from weeds; the flowers of the two last sorts stand erect when they first appear, but so soon as the florets are impregnated, and their colour changes, the foot-stalks become very flaccid toward the top, and the flowers hang downward; but when the seeds are ripe, the foot-stalks become stiff, and the heads stand erect for the wind to disperse the seeds.

COTYLEDON. *Lin. Gen. Plant.* 512. Navelwort.

The Characters are,

The flower hath one petal, which is funnel-shaped, cut into five parts at the brim; it hath five germina, which have each a squamous concave nectarium at the base, and ten erect stamina; the germen afterward become so many oblong swelling capsules, opening.

opening longitudinally with one valve, and filled with small seeds.

The Species are,

1. *COTYLEDON foliis cuculatis, serrato dentatis, alternis, caule ramoso, floribus erectis.* Lin. Sp. Plant. 429. Greater Navelwort, or *Umbilicus Veneris*.

2. *COTYLEDON foliis oblongis spinoso mucronatis, caule spicato.* Lin. Sp. Plant. 429. Navelwort with oblong pointed leaves, ending with a spine, and a spiked stalk.

3. *COTYLEDON foliis ovalibus, crenatis, caule spicato.* Lin. Sp. Plant. 429. Navelwort of Crete with an oblong fringed leaf.

4. *COTYLEDON foliis semiglobosis.* Hort. Cliff. 176. Navelwort with semiglobular leaves; or Navelwort of the Cape, with a semiglobular leaf.

5. *COTYLEDON foliis subrotundis, planis integerrimis.* Hort. Cliff. 176. Shrubby African hoary Navelwort, with roundish leaves.

6. *COTYLEDON caule ramosissimo, foliis rotundis, planis, marginibus purpureis.* Navelwort with a very branching stalk, and round, plain, hoary leaves, with purple edges.

7. *COTYLEDON caule ramoso, succulento, foliis obversè ovatis, emarginatis, marginibus purpureis.* Navelwort with a branching, succulent stalk, and obverse, oval leaves, which are indented at the top, and have purple borders.

8. *COTYLEDON caule ramoso, succulento, foliis ovatis planis, acuminatis oppositis semiamplexicaulibus.* Navelwort with a succulent, branching stalk, and oval, plain, pointed leaves, growing opposite, and half embracing the stalk.

9. *COTYLEDON caule ramoso, foliis longis, succulentissimis, supernè sulcatis infernè convexis, floribus cernuis.* Shrubby African Navelwort, with long, narrow leaves, and a yellowish flower.

10. *COTYLEDON foliis laciniatis, floribus quadrifidis.* Hort. Cliff. 175. Navelwort with cut leaves, and four pointed flowers.

The first sort, which is that used in medicine, grows upon old walls and buildings in divers parts of England, particularly in *Shropshire* and *Somersetshire*, in both which counties it greatly abounds upon old buildings, and on rocky places; but is not often found wild near London, nor often cultivated in gardens; this hath many round succulent leaves, whose foot-stalks are placed almost in the center, so as to resemble a target. These are alternately sawed on their edges; the upper surface of the leaves are hollowed in the middle, where the foot-stalks are joined on the lower side, so as to resemble a navel, from whence the plant was titled Navelwort. From between the leaves arise the foot-stalks of the flowers, which in some places grow near three feet high, and in others no more than six inches, their lower part being garnished with leaves; and their upper part with flowers, which stand close to the side of the branches, and grow erect; they are of a whitish yellow colour. It requires a dry rubbishy soil, and to have a shady position: it is a biennial plant, so that after it hath perfected seed, the plant decays; but if the seeds are scattered on walls, and old buildings, as soon as it is ripe, or if the seeds are permitted to fall on such places, the plants will come up, and thrive much better than when they are sown in the ground; and when once the plants are established upon an old wall or building, they will sow their seeds, and maintain their place, better than when cultivated with more care.

The second sort grows naturally in *Siberia*. It is a low plant, in shape like the first, but the leaves are longer and terminate in soft spines. The flower-stalks rise eight inches high, and support four or five whitish flowers, which are cut at the brim into five parts. This sort requires a very shady situation; for if it is exposed to the sun in summer, the plants will soon decay. It is propagated like the other, and requires a pretty strong soil.

The third sort grows naturally in the *Levant*; this hath a fibrous root, from which is produced a single upright succulent stalk, garnished with oblong, thick succulent leaves placed alternate, which are sawed on their edges. The upper part of the stalk is garnished with purplish flowers, growing in a loose spike, two or three being joined on the same foot-stalk, which is very short. It is a biennial plant, which decays soon after the seeds are ripe. If this sort is sown upon a wall, it will thrive better than in the ground, and be less liable to suffer by frost; so that where the seeds scatter themselves in such situations, the plants thrive better than when they are cultivated.

The fourth sort grows naturally at the *Cape of Good Hope*. This hath a thick succulent stalk, which rarely rises above a span high, dividing into many branches, garnished with thick short succulent leaves, which are very convex on their under side, but plain on their upper, not more than half an inch long, and a quarter broad, of a grayish colour, spotted over with small green spots, and sit close to the branches. The foot-stalks of the flower rise from the top of the branches, and are six inches long, naked, and support five or six flowers, which come out alternate from the side, sitting very close to the stalks; they are tubular, and cut into five parts at the top, they are greenish with purple tips.

The fifth sort grows naturally upon dry gravelly spots at the *Cape of Good Hope*. It hath a thick succulent stalk, which by age becomes ligneous, and rises three or four feet high, sending out crooked branches, which grow irregular, garnished with thick fleshy succulent leaves, about two inches long and near as wide toward the top; they are narrow at the base, and rounded at the top, of a sea green colour with a purple edge, which is frequently irregularly indented. The flowers grow upon thick succulent foot-stalks, which arise from the end of the branches, and are near a foot long, naked, and supporting eight or ten flowers, growing in an irregular umbel at the top; these are of a pale yellow colour, having long tubes which hang downward, cut into five parts at the brim, which turn backward; the stamina and style being longer than the tube of the flower, hanging downward.

The sixth sort is also a native of the *Cape of Good Hope*; this hath a short, thick, succulent stalk, which rarely rises more than a foot high, branching out on every side, so as to spread over the pots in which they are planted. These become woody by age, and are closely garnished with thick round leaves of a grayish colour with purple borders. They are plain on their upper side, but convex on their under, very fleshy, of an herbaceous colour within, and full of moisture. This sort hath not flowered in *England*, so far as I can learn. It is undoubtedly a different sort from the former, although they have been supposed to be the same by some writers.

The seventh sort is somewhat like the sixth, but the stalks rise higher; the leaves are much larger, and shaped more like those of the fifth, but are spotted on their upper side with great numbers of dark green spots; they have a deep border of purple on their edges, and sit close to the branches. This hath not as yet flowered in *England*.

The eighth sort hath been of late years introduced from the *Cape of Good Hope*, where it grows naturally. This rises with a succulent stalk near three feet high, which divides into many branches, growing erect, garnished with oval, succulent leaves, placed by pairs opposite; they are of a lively green, and end in points, and half embrace the stalks with their base. This sort hath not as yet produced any flowers in *England*.

The ninth sort grows on rocky places at the *Cape of Good Hope*. This hath a short, greenish, succulent stalk, which seldom rises more than a span high, dividing into several irregular branches, garnished with thick, succulent leaves, four

four inches long, and half an inch broad, and as much in thickness, having a broad concave furrow on their upper side, running almost their whole length, and are convex on their under side, of a bright green with a purple tip. The foot-stalks of the flowers are produced at the end of the branches, which rise a foot high, having here and there an oblong pointed leaf, growing on their side. The flowers stand upon short foot-stalks, which branch out from the principal stem; these are yellow, having pretty long tubes, which are cut at the top into five parts, and are reflexed backward. The flowers of this sort hang downward, and the stamina are longer than the tube of the flower; the reflexed parts of the petal are tipped with purple.

The tenth sort grows naturally in the warm parts of *Africa*, so is much more tender than either of the other sorts; this rises with an upright stem about a foot high, which is jointed and succulent, garnished with broad leaves, which are deeply cut on their edges; they are of a grayish colour, placed opposite, and almost embrace the stalks with their base. The foot-stalks of the flowers arise from the end of the branches, which are about six inches long, sustaining seven or eight small flowers of a deep yellow colour, which are divided into four parts almost to the bottom. The stamina of these flowers, are not longer than the short tube.

This sort requires a warm stove to preserve it through the winter in *England*, nor should it be exposed abroad in summer; for if it receives much wet, the stalks are very subject to rot, so that it should constantly remain either in the stove, or in summer be placed in an airy glass case, with other tender succulent plants, where they may have free air in warm weather, and be screened from cold and wet; but in autumn they must be removed into the stove, where they should be kept in a moderate temperature of warmth. This is propagated by cuttings, which should be taken off in summer, and planted into small pots, and plunged into a moderate hot-bed, and when they have taken root, they should be removed into the stove.

The other *African* kinds are all of them propagated by planting cuttings in any of the summer months, which should be laid in a dry place for a fortnight or more after they are taken from the plant, before they are planted; for these abound with juice, which will certainly rot the cuttings, if they are not suffered to lie out of the ground, so long as that the wounded part may heal over, and the great redundancy of sap evaporate. The soil in which these plants thrive best, is one third fresh light earth from a pasture, one third sand, and the other third part lime rubbish; these should be well mixed, and laid in a heap six or eight months before it is used, turning it over five or six times, that the parts may the better incorporate; and before it is used it will be proper to pass it through a screen, to separate the large stones, clods, &c. therefrom.

In about a month or six weeks after planting, these cuttings will be rooted, when they must be inured to bear the open air by degrees; first drawing the pots out of the tan, and setting them on the top, then raise the glasses very high in the day time; and in about three weeks after remove the pots into a green-house, and there harden them for another week; after which they may be exposed to the open air in a well defended place, observing not to set them into a place too much exposed to the sun, until they have been inured to the open air for some time.

In this place the plants may remain until the beginning of *October*; at which time you should remove them into the conservatory, placing them as near the windows as possible at first, letting them have as much free open air as the season will permit, by keeping the windows open whenever the weather is good: and now you must begin to abate your

waterings, giving it to them sparingly; but you should not suffer their leaves to shrink for want of moisture, which is another extreme some people run into for want of a little observation.

The best method to treat these plants is, to place them in an open, airy, dry glass case, among *Ficoides's* and *African* Houseleeks, where they may enjoy as much of the sunshine as possible, and have a free dry open air; for if they are placed in a common green-house amongst shrubby plants, which perspire freely, it will fill the house with a damp air, which these succulent plants are apt to imbibe; and thereby becoming too replete with moisture, often cast their leaves.

COURBARIL. See *Hymenæa*.

COWSLIP. See *Primula*.

CRAB-TREE. See *Malus*.

CRAMBE. *Lin. Gen. Pl.* 739. Sea Cabbage.

The Characters are,

The flower hath four petals, placed in form of a cross; it hath six stamina, two of which are the length of the empalement, the other four are longer. The petals have honey glands on their inside, which are longer than the stamina. It hath an oblong germen, which afterward becomes a round dry capsule, with one cell, enclosing one roundish seed.

The Species are,

1. CRAMBE *foliis cauleque glabris. Fl. Suec.* 570. Sea Cabbage with smooth stalks and leaves.

2. CRAMBE *foliis profundè laciniatis, caule erecto, ramoso.* Sea Cabbage with leaves deeply cut, and an upright branching stalk.

3. CRAMBE *foliis scabris, caule glabro. Lin. Sp. Pl.* 671. Sea Cabbage with rough leaves, and a smooth stalk.

4. CRAMBE *foliis cauleque scabris. Hort. Upsal.* 193. Sea Cabbage with rough stalks and leaves.

5. CRAMBE *foliis laciniatis, laciniis oppositis, integerrimis, foliis cauleque glabris.* Sea Cabbage with cut leaves, whose jags are opposite and entire, and smooth stalks and leaves.

The first sort sends out many broad leaves, which are jagged and furbelowed on their sides, of a grayish colour, spreading on the ground; between these arise a thick smooth foot-stalk about one foot high, which spreads out into many branches, having at each joint one leaf of the same form of those below, but much less: these foot-stalks subdivide again into many smaller, which are garnished with white flowers growing in a loose spike, composed of four concave petals placed in form of a cross; these are succeeded by round dry seed vessels, about the size of large Pease, having a single seed in each. The roots of this sort creep under ground, whereby it propagates very fast.

The seeds of the second sort were sent me from *Petersburgh*. This hath a perennial root, which sends out many oblong smooth leaves, which are pointed, and irregularly cut on their sides, into acute segments almost to the midrib; they are very smooth, and of a sea-green colour; between these arise the stalk, which grows three feet high, garnished below by oblong pointed leaves, which are acutely indented on their edges. The stalks branch out into many smaller, and subdivide again into less, which are garnished with loose spikes of white flowers like those of the first sort, which are succeeded by seeds of the same form. This differs greatly from the first, in the shape of its leaves, which are longer, ending in points, and the segments do the same, whereas those of the other are blunt, and not half so deeply cut. The stalks rise more than twice the height of the first, branch out more, and the branches grow more erect. And these differences are constant, where the plants grow in the same soil.

The third sort grows naturally in the *East*. This hath a perennial root, from which arise many leaves in the spring,

spring, which are alternately divided to the midrib, and these divisions are again alternately cut on their edges into many points, so that they have the appearance of winged leaves, and are of a grayish colour. The stalks rise about two feet high, and divide into many branches, which are terminated by loose panicles of small white flowers placed in form of a cross, which are succeeded by small round capsules, each containing a single seed.

The fourth sort is an annual plant, which grows naturally in *Spain* and *Italy*. This rises with a very branching stalk near three feet high, garnished with roundish heart-shaped leaves indented on their edges, standing upon long foot-stalks; the branches subdivide into many slender ones, which end in long loose spikes of small white flowers, and are succeeded by small round dry seed vessels, which contain a single seed. The leaves and stalks of this sort are rough.

The fifth sort hath a perennial root; this grows naturally in the *Levant*. The leaves of this are more than a foot long, and are almost triangular, but are deeply cut on the sides, into opposite segments which terminate in points. They are smooth and of a sea-green colour, spreading near the ground. The stalks rise more than two feet high, branching upward into many smaller, which are naked below, but end in loose spikes of whitish yellow flowers which are small, and are succeeded by small round seed vessels inclosing a single seed.

The first of these species is found wild upon sea shores in divers parts of *England*; but particularly in *Suffex* and *Dorsetshire* in great plenty, where the inhabitants gather it in the spring to eat, preferring it to any of the Cabbage kind; as it generally grows upon the gravelly shore, where the tide flows over it, so the inhabitants observe where the gravel is thrust up by the roots of this plant; they open the gravel, and cut the shoots before they come out, and are exposed to the open air, whereby the shoots appear as if they were blanched; and when they are cut so young, they are very tender and sweet; but if they are suffered to grow till they are green, they become tough and bitter.

This plant may be propagated in a garden, by sowing the seed soon after it is ripe, in a sandy or gravelly soil, where it will thrive exceedingly, and increase greatly by its creeping roots, which will soon overspread a large spot of ground, if encouraged; but the heads will not be fit to cut, until the plants have had one years growth; and in order to have it good, the bed in which the plants grow, should at *Michaëlnas* be covered over with sand or gravel about four or five inches thick, which will allow a proper depth for the shoots to be cut before they appear above ground; and if this is repeated every autumn, in the same manner as is practised in earthing of *Asparagus* beds, the plants will require no other culture.

The other sorts are only preserved in curious gardens of plants for variety, but are not of any use or beauty. The perennial sorts may be propagated in the same manner as the first.

CRANE'S-BILL. See *Geranium*.

CRANIOLARIA. *Lin. Gen. Plant.* 670. *Martynia. Housf. Gen.*

The Characters are,

The flower hath a permanent empalement, composed of four short narrow leaves and a swollen hood, which is cut longitudinally on the side. The flower hath one petal which is unequal, having a very long tube, whose brim is divided into two lips. It hath four stamina, two of which are the length of the tube, and two are shorter. At the bottom of the tube is situated an oval germen, which afterward becomes an oval leathery fruit, pointed at both ends, opening with two valves, inclosing a depressed, woody nut, pointed at both ends and recurved, having two or three furrows, so as to resemble a skull opening in two parts.

The Species are,

1. CRANIOLARIA *foliis cordatis, angulatis. Lin. Sp. Plant.* 618. Craniolaria with heart-shaped, angular leaves.
2. CRANIOLARIA *foliis lanceolatis, dentatis. Lin. Sp. Pl.* 618: Craniolaria with spear-shaped, indented leaves.

The first sort was discovered in the neighbourhood of *Carthage* in *New Spain*. This is an annual plant, which rises with a branching stalk about two feet high; the branches come out opposite, which are hairy and viscous; the leaves also are placed opposite upon very long foot-stalks; these are of different shapes, some of them are divided into five lobes, others into three, and some are almost heart-shaped, ending in acute points; they are hairy and clammy. The flowers are produced from the side, and also at the end of the branches, standing on short foot-stalks, having an inflated sheath or cover, out of which the tube of the flower arises, which is seven or eight inches long, and very slender, but at the top is divided into two lips, the under being large, and divided into three broad segments, the middle being larger than the other two; the upper lip is roundish and entire; the flowers are succeeded by oblong fruit, having a thick dry skin, which opens lengthways, inclosing a hard furrowed nut, with two recurved horns. This is an annual plant, whose seeds must be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a moderate hot-bed, carefully shading them from the sun, till they have taken new root; after which they should have free air admitted to them, to prevent their drawing up weak, and treated in the same manner as other tender exotic plants, being too tender to thrive in the open air in *England*; so that when they are grown too large to remain under the frames, they should be removed into the bark stove, and plunged into the tan bed, where they will flower, and with good management they often perfect their seeds in *England*. But the seeds of this plant should remain on till they drop, otherwise they will not grow; for the outer covers of these seeds split open and drop off, like those of the *Almond*, before the seeds are fully ripened.

The second sort grows naturally at the *Hawannah*, and in some of the other islands in *America*. This rises with a shrubby stalk to the height of ten or twelve feet, dividing upward into a few branches, which are garnished with spear-shaped leaves, cut on their edges; these are soft and hairy. The flowers are produced from the side of the branches, growing several together on the same foot-stalk; they are shaped like those of the *Foxglove*, of a greenish yellow colour, with brown spots on the inside; the flowers have a swelling tube which is recurved, and the brim is slightly divided into five unequal segments.

This sort is propagated by seeds, which must be sown on a hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a separate small pot, and plunged into a fresh hot-bed, where they must be shaded from the sun till they have taken fresh root; then they must have air admitted to them daily. In autumn they must be removed into the bark stove, and plunged into the tan bed; during the winter season the plants should not have much water, and may be treated in the same manner as other tender plants from those countries.

CRASSULA. *Dillen. Hort. Elth.* 114. Lesser Orpine Live-ever.

The Characters are,

The flower consists of five narrow petals, which are joined at their base, but are reflexed, and spread open at the brim: in the bottom of the tube are situated five nectaria, and five stamina situated round these. At the bottom of the tube are placed five oblong, pointed germina; after the flower is past, these become five capsules, opening lengthways, and filled with small seeds.

The

The Species are,

1. *CRASSULA foliis planis cartilagineo-ciliatis, basi connatis vaginantibus.* Vir. Cliff. 26. Shrubby African Navelwort, with umbels of scarlet flowers.

2. *CRASSULA foliis lanceolato-subulatis sessilibus connatis, canaliculatis subtus convexis.* Hort. Cliff. 116. Tallest Crassula with perfoliate leaves.

3. *CRASSULA foliis oppositis, obtusè ovatis, integerrimis, hinc angustioribus.* Hort. Cliff. 496. Crassula with an Orpine leaf.

4. *CRASSULA foliis oppositis, oblongis, planiusculis, distinctis, ciliatis.* Hort. Cliff. 496. Crassula with leaves like Orpine placed crossways.

5. *CRASSULA foliis oppositis, patentibus, scabris.* Lin. Sp. Plant. 283. Shrubby African Navelwort, with narrow, rough, pointed leaves, and a greenish flower.

6. *CRASSULA foliis subulatis, radicans, caule nudo.* Hort. Cliff. 116. Crassula with a long Onion-like leaf.

7. *CRASSULA caule flaccido, foliis connatis, cordatis, succulentibus, floribus confertis terminalibus.* Lesser Orpine with a weak stalk growing through the leaves, which are heart-shaped and succulent, and flowers growing in clusters at the end of the branches.

8. *CRASSULA foliis longis, teretibus, alternis, caule fruticoso, ramofo.* Lesser Orpine with long, taper leaves, placed alternate, and a branching, shrubby stalk.

9. *CRASSULA caule flaccido, prolifero, determinatè-foliOSO, foliis patentissimis, imbricatis.* Hort. Cliff. 496. African Rock Housleek, with leaves like the common sort, spreading like a Rose.

10. *CRASSULA caule flaccido repente, foliis oppositis.* Lin. Sp. Pl. 283. Creeping Crassula with the appearance of Purslane.

11. *CRASSULA foliis obverse-ovatis, oppositis, caule fruticoso, succulento.* Tree-like Crassula with the appearance of Purslane.

The first sort hath a round reddish stalk which is jointed, rising about three feet high, which divides upward into many irregular branches, garnished with oblong, plain leaves placed opposite, having a gristly border, set with small silver hairs; they closely embrace the stalks with their base, and form a sort of sheath or cover to it. The flowers terminate the branches in close umbels, sitting very close at the top of the branches; these are funnel-shaped, having pretty long tubes cut at the top into five parts which spread open; they are of a fine scarlet colour, and stand erect. This is propagated by cuttings during any of the summer months; which should be taken off three weeks before they are planted, and laid in a dry place that the wounded part may heal over; then they should be each planted in a small pot, and plunged into a moderate hot-bed, giving them but little water; in about six weeks these will have put out roots, when they should be gradually inured to the open air, into which they should be removed, placing them in a sheltered situation, where they may remain till autumn; when they must be removed into a dry airy glass case, where they may enjoy the sun as much as possible, and be screened from the wet and cold. In warm dry weather during the summer months, while they are abroad, these plants should be gently watered two or three times a week, but in winter they should have very little given them. These plants require no artificial heat in winter, but they must be secured from frost and wet.

The second sort will rise with an upright stalk ten or twelve feet high, if it is not broken or injured, but it will require support; for the stalks being slender, and the leaves very weighty, they are very subject to break, especially if they are exposed to the wind. The leaves of this plant are about three inches long, they are hollowed on the upper side, and have a convex ridge on their lower, and are

placed opposite, furrounding the stalks with their base and alternately cross each other. They are very thick succulent, and of a pale green colour, ending in acute points; at the top of the stalk the flowers are produced in large clusters, which are of a whitish herbaceous colour, having short tubes, cut into five parts at the brim, which spread open. The stalk which sustains the flowers is pretty thick and succulent, generally turning first downward, and then upward again, almost in the form of a syphon. This sort is propagated by cuttings in the same manner as the first, and the plants require the same treatment.

The third sort rises with a weak succulent stalk about two feet high, sending out many irregular branches, garnished with oblong, oval, thick leaves, plain on their upper side, but convex below, of a deep green, and their borders set with a few silvery hairs. The stalk which supports the flowers rises from the top of the branches, and is from four to six inches long, putting out several side branches, which grow erect; these are terminated by large clusters of small greenish flowers.

This is propagated by cuttings in the same manner as the two former, but being pretty hardy, should not be so tenderly treated; for if the cuttings of this are planted in a border of light earth, they will put out roots, and may afterward be taken up and potted.

The fifth sort hath a very weak succulent stalk, which rises about a foot and an half high, dividing upward into small branches, garnished with thin rough leaves, which are flat, near two inches long, and a quarter broad at their base, gradually narrowing to a point; they are rough, placed opposite, and embrace the stalks with their base. The flowers come out in small clusters at the end of the branches, which are small, and of an herbaceous colour, so make no figure. This may be propagated by cuttings, which may be treated in the same manner as the fourth sort.

The sixth sort never rises with a stalk, but the leaves come out close to the ground, forming a sort of head; they are taper and succulent, ending in points, and frequently put out roots: out of the center of the heads arise the flower-stalk, which grows about six inches high, and branches into two or three smaller upward, each being terminated by clusters of greenish flowers, which make no great appearance.

This is propagated by taking off the heads, or side offsets, which should be laid to dry three or four days before they are planted, then they may be treated in the same manner as the other hardier sorts before-mentioned.

The seventh sort hath been lately introduced from the *Cape of Good Hope*; this hath very slender stalks, which are reddish, and full of joints; they trail upon the ground, unless they are supported, and are closely garnished with thick, succulent, heart-shaped leaves, placed opposite, which are closely joined at their base, so that the stalks run through them; they are of a grayish colour; the stalks are divided, and grow about eight or nine inches long, terminated by clusters of small white flowers, sitting very close to the top of the stalks. It is propagated by cuttings in the same manner as the other hardier sorts, and may be treated in the same way.

The eighth sort rises with a shrubby stalk four or five feet high, dividing into many branches, which at first are taper and succulent, but by age become ligneous; these are garnished with very slender, taper, succulent leaves, which are near three inches long, flaccid, and generally turning downward, especially in winter, when they are in the house; but it hath not as yet flowered here. This is equally hardy with the former sorts, and takes easily from cuttings, so may be treated in the same way.

The ninth sort is a low plant, with the appearance of Housleek, having open spreading heads, very like those of

some sorts of Housleek; these grow on the ends of very slender trailing stalks, which are produced in plenty on every side the parent plant, in like manner as the childing Marigold. The flower stalks arise from the center of these heads, which are naked, about four inches long, and are terminated by close clusters of herbaceous flowers. This plant propagates very fast by the side heads, which come out from the parent plant, and frequently put out roots as they trail on the ground, so may be taken off and potted, during any of the summer months; it is equally hardy with the former sorts, so the plants may be treated in the same way.

The tenth sort hath very slender, trailing, succulent stalks, of a reddish colour, which put out roots at the joints as they lie upon the ground. The stalks and leaves of this sort have the appearance of Purslane, and trail upon the ground like Chickweed. The flowers are produced in small clusters at the end of the branches; these are white, with a blush of purple at their brim. This sort is easily propagated by its trailing branches, and the plants require the same treatment as the other hardy sorts, but is of short duration.

The eleventh sort rises with a very thick, strong, succulent stalk, to the height of five feet, sending out branches on every side, so as to form a kind of pyramid, the lower branches being extended to a great length, and the other diminishing gradually to the top; these are of a red, or a purplish colour, and very succulent: they are garnished with roundish succulent leaves, very like those of Purslane, from whence the gardeners have titled it the Purslane tree.

This sort hath not flowered in *England*, though it has been many years in the gardens, so that we are not sure if it is properly ranged in this genus; but from the outward appearance it seems to be nearly allied to some of the other species, on which account *Dr. Dillenius* has placed it here.

It is propagated with great facility by cuttings, which may be planted during any of the summer months, but these should be laid to dry for some days before they are planted, that the wounded part may be healed over, otherwise they will rot. This is somewhat tenderer than the four sorts last mentioned, so must be placed in a warm glass case in winter, where it may enjoy the full sun, and should have very little water during that season; in summer the plants should be placed abroad in a sheltered situation, and in warm weather will require to be refreshed with water twice a week, but as the stalks are very succulent, so too much wet at any season is very hurtful to these plants.

All the hardy sorts of *Crassula*, may be treated in the same way as the *Ficoides*, and other hardier kinds of succulent plants, with this difference only, not to give them so much water; but the first, second, and eleventh sorts require to be placed in a warm dry glass case in winter, and must not be so long exposed abroad in the summer, as the other species, and should have but little water, especially in the winter.

CRATÆGUS. *Tourn. Inst. R. H.* 633. The Wild Service.

The Characters are,

The flower hath five roundish concave petals, and many stamina, which are inserted in the empalement. The germen is situated under the flower, which afterward becomes an oval, or roundish umbilicated berry, inclosing two oblong hard seeds.

The Species are,

1. CRATÆGUS foliis ovatis inæqualiter serratis, subtus tomentosis. *Hort. Cliff.* 187. Cratægus with a roundish sawed leaf, white on the under side, commonly called *Aria Theophrasti*, and in some countries the white Beam, or white Leaf tree.

2. CRATÆGUS foliis cordatis septangulis, lobis infimis divaricatis. *Lin. Sp. Pl.* 476. Wild, or Maple-leaved Service.

3. CRATÆGUS foliis oblongo-ovatis serratis, utrinque virentibus. Cratægus with an oblong sawed leaf, green on both sides.

4. CRATÆGUS foliis oblongo-ovatis, crenatis, subtus argenteis. *Virginia* Cratægus with an *Arbutus* leaf.

The first sort grows naturally on the chalky hills in *Kent*, *Surry*, and *Suffex*, and in some other parts of *England*; it grows to the height of thirty or forty feet, with a large trunk, and divides upward into many branches; the young shoots have a brown bark, covered over with a meally down; these are garnished with oval leaves between two and three inches long, and one and an half broad in the middle, of a light green on their upper side, but very white on their under, having many prominent transverse veins, running from the midrib to the border, where they are unequally sawed. The flowers are produced at the end of the branches in bunches, their foot-stalks being meally, as are also the empalements of the flowers, which are cut into five obtuse segments, that are reflexed. The flowers have five short petals, which spread open, and are like those of the Pear tree, having a great number of stamina of the same length with the petals, terminated by oval summits. The germen, which is situated below the flowers, afterward becomes an oval fruit, crowned with the empalement of the flower, having one cell, in which is inclosed three or four seeds. It flowers in *May*, and the fruit ripens in autumn.

This tree may be propagated by seeds, which should be sown soon after they are ripe; for if they kept out of the ground till the spring, they remain at least one year in the ground before the plants appear. When the plants come up, they may be treated in the same manner as the *Haws*, but they should by no means be headed, or cut down; when these plants are upon a poor chalky soil, they make great progress, and the wood is very white and hard, so has been often used for making cogs for mills, and many other purposes where hard tough timber is wanted.

It may also be propagated by layers in the same manner as the *Lime tree* and *Elm*, but these should be laid in the young wood, and they are two years before they have sufficient roots to transplant.

The tree will take by grafting, or budding upon *Pear* stocks very well, and *Pears* will take by grafting on these trees, so that there is a nearer affinity between the *Cratægus* and the *Pear*, than there is between either of these and the *Mespilus*; for although both these will sometimes take upon the *Mespilus*, yet neither of them thrive so well, or last so long, when grafted, or budded upon those stocks, as they do upon each other.

The second sort grows naturally in many parts of *England*, and is chiefly found upon strong soils; it formerly grew in great plenty in *Cane Wood*, near *Hampstead*, and lately there were some young trees growing in *Bishops Wood*, near the same place; this rises to the height of forty or fifty feet, with a large trunk. The young branches are covered with a purplish bark, garnished with leaves placed alternately, standing on pretty long foot-stalks, which are cut into many acute angles, like those of the *Maple tree*; they are near four inches long, and three broad in the middle, having several smaller indentures toward the top; of a bright green on their upper side, but a little woolly on their under. The flowers are produced in large bunches toward the end of the branches, they are white, and shaped like those of the *Pear tree*, but smaller, and stand upon longer foot-stalks; and are succeeded by roundish compressed fruit, which are shaped like large *Haws*, and ripen late in autumn, and if kept till they are soft, in the same way as *Medlars*, they have an agreeable acid flavour. The fruit of this tree is annually sold in the *London* markets in autumn.

The third sort grows naturally upon mount *Baldus*, and on other mountainous parts of *Italy*; it rises with a woody trunk about twenty feet high, dividing into many branches closely garnished with oblong sawed leaves, standing alternate on very short foot-stalks; they are about three inches long, and one and an half broad, and are slightly sawed on their edges, of a deep green on both sides. The flowers are produced at the end of the branches in small bunches, which have rarely more than four or five in each; they are white, and much smaller than those of the former sorts; and are succeeded by fruit about the size of the common Haw, which is of a dark brown colour when ripe.

This sort may be propagated in the same manner as the first, but requires a strong deep soil, otherwise it will not thrive. It is very hardy in respect to cold, but at present is very rare in *England*.

The fourth sort grows naturally in most parts of *North America*; this seldom rises more than five or six feet high, it hath generally many shrubby stalks arising from the same root, garnished with leaves placed alternate, standing on very short foot-stalks; they are about two inches long, and one broad, ending in a point, of a deep green on their upper side, and a little woolly on their under, of a yellowish white colour; these leaves in autumn change to purple, some time before they fall off. The flowers are produced in small bunches at the end, and also from the side of the branches; they are small, white, and shaped like those of the former sorts, but the petals are narrower, and are succeeded by small fruit, shaped like those of the common Haw, which turn red in autumn, and when fully ripe are of a dark brown colour.

This sort may be propagated by seeds, which should be sown in autumn, in the same manner as hath been directed for the first sort; but as these seeds are frequently brought from *America*, and do not arrive here till spring, so they may be buried in the ground the first summer, and taken up and sown in the autumn, as is frequently practised with Haws; and when the plants have grown one year in the place where they were sown, they may be transplanted, and treated in the same way as the other sorts.

This is generally planted among flowering shrubs of the same growth, where it will add to the variety.

CRATEVA. *Lin. Gen. Plant.* 528. Garlick Pear.

The Characters are,

The flower hath four oval petals, which are narrow at their base, and broad at the top. It hath many bristly stamina, which are longer than the petals, and a long incurved style, upon which sits the oval germen, which afterward becomes a large fleshy globular fruit with one cell, including many kidney-shaped seeds.

The Species are,

1. CRATEVA *inermis*. *Flor. Zeyl.* 211. Smooth Crateva, or Garlick Pear.

2. CRATEVA *spinosa*. *Flor. Zeyl.* 212. Prickly Crateva.

The first sort grows naturally in both *Indies*, where it has a very large trunk, which rises to the height of thirty feet, or upward, covered with a dark green bark, and forms a large head: the branches are garnished with trifoliate leaves, standing on pretty long foot-stalks; the middle lobe, which is much larger than either of the other, is oval, about five inches long, and two and a half broad in the middle; the two side lobes are oblique, and turn at both ends toward the middle, so that their mid-rib is not parallel to the sides, these two end in acute points; they are smooth, of a light green on the upper side, but pale on their under. The flowers are produced at the ends of the branches, standing upon long foot-stalks; their empalements are of one leaf, which are cut into four segments almost to the bottom; the flower hath four oblong petals, which spread open, and are

reflexed, having many long slender stamina, which are connected at their base, but spread open above, and are terminated by oblong purple summits; these surround a slender long style, upon which is situated the oval germen, which is crowned by an obtuse stigma; the germen afterward becomes a round fruit, about the size of an Orange, having an hard brown shell, or cover, inclosing a mealy pulp, filled with kidney-shaped seeds. This fruit hath a strong smell of Garlick, which is communicated to the animals that feed on it.

This is propagated by seeds, which must be sown on a hot-bed in the spring, and when the plants come up, they must be treated in the same manner as hath been directed for the *Annona*, to which article the reader is desired to turn for the culture.

The second sort grows naturally in *India*, where it becomes a very large tree, sending out many long branches, garnished with trifoliate leaves, which are oblong, entire, and end in acute points; between these the branches are armed with long sharp thorns, which come out by pairs, and spread asunder; the flowers are produced in small clusters from the side of the branches, five or seven standing upon a common branching foot-stalk; these have each five acute petals, which are reflexed, and many stamina which stand round a single style of the same length; the petals are green on the outside, and whitish within, and have a grateful odour. After the flower is past, the germen swells to a large fruit, the size of an Orange, having a hard shell, which incloses a fleshy viscous pulp, of a yellowish colour, having many oblong plain seeds situated within it; the pulp of this fruit hath an agreeable flavour when ripe, so is frequently eaten in *India*, where they serve up the fruit, mixed with sugar and Orange, in their deserts, and is esteemed a great delicacy.

This sort is propagated by seeds, and requires the same treatment as the former.

CREPIS. *Lin. Gen. Plant.* 819. Bastard Hawkweed.

The Characters are,

It hath a flower composed of many hermaphrodite florets, which are included in a double empalement; these florets are of one leaf, uniform, tongue-shaped, and are indented at the top in five parts, and have each five short hairy stamina; the germen is situated in the center of the florets, which afterward becomes an oblong seed, crowned with a long feathery down, which sits upon little foot-stalks.

The Species are,

1. CREPIS *foliis amplexicaulibus, lanceolatis, omnibus dentatis: radicalibus sinuatis*. *Vir. Cliff.* 79. Hawkweed with a Dandelion leaf, and a soft red flower.

2. CREPIS *foliis pinnatis angulatis, petiolatis, dentatis*. *Prod. Leyd.* 126. Hawkweed with hairy wild Succory leaves, smelling like Castor.

3. CREPIS *involveris calyce longioribus incurvatis, foliis lanceolatis dentatis*. Greater Spanish Hawkweed, with flowers black in the middle.

4. CREPIS *foliis amplexicaulibus, oblongis acuminatis inferioribus supernè, summis infernè, denticulatis*. *Hort. Upsal.* 238. Alpine Hawkweed with a Viper's Grass leaf.

There are several other species of this genus, some of which grow naturally in *England*, and others are weeds in divers parts of *Europe*, so are rarely admitted into gardens, therefore I shall not enumerate them here.

The first sort grows naturally in *Apulia*, but is now commonly cultivated in the *English* gardens for ornament; it is an annual plant, which perishes after it hath ripened seeds; this hath many spear-shaped leaves which spread on the ground, and are deeply jagged on their sides; between them arise the branching stalks, which grow a foot and a half high, garnished with oblong leaves deeply indented on their

edges, embracing the stalks with their base; the stalks are each terminated by one large radiated flower, of a soft red colour, composed of many half florets, which are succeeded by oblong seeds crowned with a feathery down.

The seeds of this plant should be sown in the spring on the borders of the flower-garden where they are designed to remain, so that if six or eight seeds are sown in each patch, when the plants come up they may be reduced to three or four; and if these are kept clean from weeds, they will require no other culture. If the seeds are sown in autumn, or permitted to scatter, the plants will come up and live through the winter without shelter, and these will flower early in the spring.

The second sort grows naturally in the south of *France* and in *Italy*; this is a biennial plant, and sometimes, when it is in poor ground, it will continue longer; this hath a thick tap root which strikes deep into the ground, sending out many small fibres; the lower leaves are from four to five inches long, and about a quarter of an inch broad, having several deep jags on their edges; from the same root arise four or five stalks, which grow about nine or ten inches high; the lower part of these are garnished with leaves of the same form with those at the root, but are smaller, and more jagged; the upper part of the stalks are naked, and terminated by one flower of a gold colour, inclining to copper, composed of many florets which are included in a single empalement; the flowers are succeeded by oblong narrow seeds, crowned with a feathery down; the whole plant, when bruised, emits a strong odour of Castor.

It is propagated by seeds in the same manner as the first sort, but as this continues longer, so the seeds need not be annually sown: the plant will require no other culture but to keep them clean from weeds.

The third sort is an annual plant, which grows naturally in *Spain*, but is now frequently propagated in the flower-gardens for ornament; this puts out leaves near the root, which are nine inches long, and almost two broad in the middle, of a light green colour, and a little jagged on their edges; the stalks rise a foot and a half high, and are garnished with leaves of the same form as those at bottom, but are smaller; the flowers are produced at the end of the branches, these have a double empalement, composed of many long, very narrow leaves; the outer series are reflected downward, and turn upward again, and are inflexed at their extremities; the flowers are composed of many florets, which spread regularly in form of rays, situated over each other like scales of fish; the bottom or middle is black, so make a pretty appearance in a garden: this plant requires the same culture as the first, and is equally hardy, so that where the seeds are permitted to scatter, the plants will come up without care.

The fourth sort grows naturally on the *Alps*; this is also an annual plant, which sends out many leaves near the root five inches long, and almost two broad at their base; the upper part of these are slightly indented, but their lower are entire; the stalks are strong, upright, rising two feet high, and are terminated by pale white flowers, inclosed in a strong hairy empalement; this requires the same culture as the first, and the seeds will scatter about the garden, so that if the plants are not destroyed, they will maintain themselves without any care.

CRESCENTIA. *Lin. Gen. Plant.* 680.— Calabash tree.

The Characters are,

The flower hath one petal, which is irregular, having a curved gibbous tube; it hath an empalement of one leaf, cut into two obtuse segments, which are concave; it hath four stamina, two of which are the length of the petal, the other are shorter, and an oval germen, which afterward becomes an oval or bottle-shaped fruit, with a hard shell inclosing many flat heart-shaped seeds.

The Species are,

1. *CRESCENTIA foliis lanceolatis, utrinque attenuatis. Hort. Cliff.* 327. Calabash tree with oblong narrow leaves, and a large oval fruit.

2. *CRESCENTIA foliis oblongo-ovatis, fructu rotundo, cortice fragili.* Broad-leaved Calabash tree, whose fruit hath a tender shell.

The first sort grows naturally in *Jamaica*, and in all the *Leeward Islands*; this hath a thick trunk, covered with a whitish bark, which rises from twenty to thirty feet high, and at the top divides into many branches, forming a large regular head, garnished with leaves which come out irregularly, sometimes single, and at others many arise from the same knot; they are near six inches long, and one and a half broad in the middle, of a lucid green, and have very short foot-stalks; the flowers are produced from the side of the large branches, and sometimes from the trunk, standing upon long foot-stalks; they have but one petal, which is irregular, having an incurved tube, which is divided at the brim into two irregular segments, which turn backward; these are of a greenish yellow colour, striped and spotted with brown; they have four slender stamina of the same colour with the petal, which are of unequal lengths, two being full as long as the petal, and the other are much shorter, terminated by oblong summits, divided in the middle, which lie prostrate on the stamina. From the lower part of the tube arises a long slender foot-stalk, supporting the oval germen, which afterward turns to a large fruit, of different forms and size; they are often spherical, sometimes they are oval, and at other times they have a contracted neck like a bottle, and are so large, as when the pulp and seeds are cleaned out, the shells will contain three pints or two quarts of liquid. These fruit or shells are covered with a thin skin of a greenish yellow when ripe, which is peeled off; and under this is a hard ligneous shell, inclosing a pale yellowish soft pulp, of a tart unfavoury flavour, surrounding a great number of flat heart-shaped seeds.

The shells of this fruit are cleaned of their pulp, and the outer skin taken off by the inhabitants of the islands, and are dried; then they use them for drinking-cups, some of which are tipped with silver, and to the necks they fasten handles; and some of the long small fruit are formed into the shape of spoons or ladles, and are used as such; the round ones are cut through the middle, and are used as cups for chocolate. In short, they convert these shells into many sorts of furniture, which is the principal use made of the fruit, for the pulp is seldom eaten.

The second sort seldom rises more than fifteen or twenty feet high, with an upright trunk, covered with a white smooth bark, sending out many lateral branches at the top, garnished with leaves three inches in length, and one and a quarter broad, ranged alternately on the branches, sitting upon short foot-stalks, of a deeper green than those of the first sort, and their edges are entire; the flowers come out from the side of the large branches and the trunk; they are smaller, and of a deeper yellow colour than those of the first; the fruit of this is sometimes round, at others oval, some being much larger than the other; the shells of this fruit are thin and very brittle, so are unfit for any purposes to which those of the former are employed: the wood of this tree is hard and very white, so might be useful, were it not for the plenty of other sorts, which abound in many of the islands.

These trees are too tender to live abroad in *England*, so require a warm stove to be preserved here; they are easily propagated by seeds, which, when fully ripe, should be brought over in the fruit; for when the seeds are taken out of the pulp abroad, and sent over hither, if they are long in their passage, they will lose their growing quality before they

they arrive; the seeds must be sown on a good hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a small half-penny pot, and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken fresh root; then they must be treated in the same manner as other tender plants which are natives of the same countries, keeping them in the tan bed of the bark stove, and should have but little water in winter; in summer they will require to be gently watered two or three times a week, according to the warmth of the season, and should have a large share of air admitted to them; these plants may also be propagated by cuttings.

CRESS, the garden. See Nasturtium.

CRESS, the Indian. See Tropæolum.

CRESS, the water. } See Sifymbrium.

CRESS, the winter. }

CRINUM. Lin. Gen. Plant. 366. Asphodel Lilly.

The Characters are,

The flower hath one petal, which is funnel-shaped, deeply cut at the top into six parts, which are reflexed; it hath six long stamina, which are inserted in the tube of the petal, spreading open; the germen is situated in the bottom of the flower, which afterward becomes an oval capsule with three cells, each containing one oval seed; the flowers are included in a two-leaved sheath.

The Species are,

1. CRINUM foliis sublancoelatis planis, corollis obtusis. Lin. Sp. Plant. 292. African tuberous Crinum, with a blue umbellated flower.

2. CRINUM foliis carinatis. Flor. Zeyl. 127. Crinum with keel-shaped leaves.

3. CRINUM corollarum apicibus introrsum unguiculatis. Lin. Sp. Plant. 292. Crinum with ever-green leaves, and many white flowers.

4. CRINUM foliis carinatis, basi angustioribus, floribus profundè dissectis. Crinum with keel-shaped leaves which are narrower at their base, and flowers deeply cut.

The first sort grows naturally at the Cape of Good Hope; the root of this plant is composed of many thick fleshy fibres, diverging from the same head, which strike deep into the ground; from the same head arises a cluster of leaves surrounding each other with their base, so as to form a kind of herbaceous stalk, about three inches high, from which the leaves spread only two ways, appearing flat the other two. The flower-stalk arises by the side of these leaves, which is round, hollow, and rises upward of three feet high, terminated by a large head of flowers, included in a kind of sheath, which splits into two parts, and is reflexed; the flowers stand each upon a foot-stalk about one inch long; they are tubulous, of one petal, which is cut almost to the bottom into six oblong blunt segments, which are waved on their edges; in the center is situated an oval three cornered germen, supporting a long style, which is attended by six stamina, two of the same length, two somewhat shorter, and the two which rest upon the lower segments are the shortest; the flowers are of a bright blue colour, and grow in large bunches, so make a fine appearance; they begin to flower in September, and frequently continue in beauty till Christmas, which renders them more valuable.

It is propagated by offsets which come out from the side of the plants; they may be taken off the latter end of June, at which time they are in their greatest state of rest; when the plants should be turned out of the pots, and the earth carefully cleared away from the roots; then the fibres of the offsets should be separated from those of the old roots, and the offsets may be taken from the old plants, being careful not to break their heads; but where they adhere so closely to the old plant, as not to be so separated, they must be cut off with

a knife, taking great care not to wound or break the roots of either the offsets or the parent plant. When these are parted, they should be planted each into a separate pot, and placed in a shady situation, where they may enjoy the morning sun, giving them a little water twice a week, if the weather proves dry; but they must not have too much wet, especially at this season, when they are almost inactive, for as the roots are fleshy and succulent, so they are apt to rot with great moisture. In about five weeks time the offsets will have put out new roots, when the pots may be removed to a more sunny situation, and then they may have a little more water, which will strengthen their flowering; but it must not be given them too liberally, for the reasons before given. In September they will put out their flower-stalks, and toward the end of that month the flowers will open, when, if the weather should be very wet or cold, they should be removed under shelter, to prevent the flowers from being injured; but they should have as much free air as possible, otherwise the flowers will be pale coloured and weak. Toward the end of October they should be removed into the green-house, and placed where they may enjoy as much free air as possible, and not be over-hung by other plants; in the winter they may have a little water once a week or oftener in mild weather, but in frost they should be kept dry; it should not have any artificial warmth in winter, and must be placed in the open air in summer.

The second sort hath large bulbous roots, which send out many large fleshy fibres, which have bulbs formed at their ends; the leaves are near three feet long, hollow on their upper side, and closely fold over each other at their base; the outer leaves generally turn downward at the top; they are of a deep green: the flower-stalks arise on one side the leaves, which are thick, succulent, and hollow in the middle, and a little compressed on two sides; these grow two feet high or more, and are of the same colour with the leaves; these are terminated by large umbels of flowers, which hath a sort of sheath or cover, which splits lengthways, and is reflexed back to the stalk, where it dries and remains; the flowers have narrow tubes near four inches long, which are deeply cut into six long segments, which are reflexed back almost to the tube; in the center arises the style, attended by six long stamina, which stand out beyond the petal, and are terminated by oblong prostrate summits of a yellow colour. After the flowers are past, the germen, which is situated at the bottom of the tube, becomes a large roundish three cornered capsule, having three cells, two of which are generally abortive, and the third hath one or two irregular bulbs, which if planted produce young plants.

The third sort hath broader leaves than the second, which are plain, and not hollowed on their upper side, but they are shorter and of a lighter green; these embrace each other at their base; by the side of these arise the flower stalk, which is compressed and hollow, rising about three feet high, terminated by large umbels of white flowers, like those of the former sort, but the segments of the petal are broader and not so much reflexed.

The fourth sort hath roots like those of the second; the leaves of this are narrower at their base, and are stained with purple on their under side; the flower-stalks are purple, and grow to the same height as those of the second; the flowers are in shape like them, but the tube is purple, and the segments have a purple stripe running through them; the stamina also are purple, which renders this more beautiful than either of the other sorts, and these differences are constant in all the plants which rise from seeds, so there can be no doubt of its being a distinct sort.

These three sorts grow naturally in both Indies, so are tender, therefore must be kept in a stove, otherwise they will

will not thrive in *England*. They are easily propagated by offsets, which the roots put out in plenty, or by the bulbs which succeed the flowers, and ripen perfectly here. These must be planted in pots, and plunged into the tan bed in the stove, where the plants will make greater progress, and flower oftener, than when they are placed on shelves; though in the latter way they will succeed very well, provided they are kept in a good temperature of heat. The roots should be transplanted in the spring, and all the offsets taken off, otherwise they will fill the pots, and starve the old plants; they must be frequently refreshed with water, but it must not be given them too plentifully, especially in winter.

CRITHMUM. *Lin. Gen. Plant.* 303. Samphire.

The Characters are,

It is a plant with an umbelliferous flower; the general umbel is uniform; the flowers have five oval inflexed petals, which are almost equal, and five stamina the length of the petals; the germen is situated under the flower, which afterward becomes an oval compressed fruit, dividing into two parts, each having one compressed, elliptical, furrowed seed.

The Species are,

1. CRITHMUM *foliolis lanceolatis carnosis*. *Hort. Cliff.* 98. Samphire with spear-shaped, fleshy leaves.

2. CRITHMUM *foliolis lateralibus bis trifidis*. *Hort. Cliff.* 98. Pyrenean Parsley, with the appearance of scorching Carrot.

The first sort grows upon the rocks by the sea side, in many parts of *England*. This hath a root composed of many strong fibres, which penetrate deep into the crevices of the rocks, sending up several fleshy succulent stalks, which rise about two feet high, garnished with winged leaves, composed of three or five divisions, each of which hath three or five small, thick, succulent leaves, near half an inch long; the foot-stalks of the leaves embrace the stalks at their base. The flowers are produced in circular umbels at the top of the stalks; these are of a yellow colour, composed of five petals, which are near equal in size, and afterward are succeeded by seeds like those of Fennel, but are larger. This herb is pickled, and esteemed very comfortable to the stomach, and is very agreeable to the palate; it provokes urine gently, removes the obstructions of the viscera, and creates an appetite. It is gathered on the rocks, where it grows naturally; but the people who supply the markets with it seldom bring the right herb, but, instead of it, they bring a species of Aster, which is called Golden Samphire, of a different flavour from the true, nor has it any of its virtues.

This plant is with difficulty propagated in gardens, nor will it grow so vigorous with any culture, as it does upon rocks; but if the plants are planted on a moist gravelly soil, they will thrive tolerably well, and may be preserved some years: it may be propagated either by seeds or parting of the roots.

The second sort is by *Tournefort* ranged in his genus of *Apium*. This grows naturally on the *Pyrenean* mountains; it is a biennial plant, which doth not flower till the second year, and perishes soon after the seeds are ripe. There are two or three varieties of this plant, which differ in their outer appearance; one of these is titled by *Mr. Ray*, *Apium montanum* *sive*, *petræum album*. This is of humbler growth than the other; the small leaves are broader, and not so much cut on their edges, and are of a paler green: these plants are preserved in a few gardens for the sake of variety. They are propagated by seeds, which should be sown where they are designed to remain, and will require no other culture but to keep them clean from weeds, and thin them where they are too close.

CRISTA PAVONIS. See *Poinciana*.

CROCUS. *Lin. Gen. Plant.* 53. Saffron.

The Characters are,

The flower hath one petal, which is deeply cut into six oblong equal segments, and three stamina, which are shorter than the petal; the roundish germen is situated at the bottom of the tube, which afterward becomes a roundish fruit with three cells, filled with roundish seeds.

The Species are,

1. CROCUS *spathâ univalvi radicali*, *corollæ tubo longissimo*. *Lin. Sp. Plant.* 36. Cultivated Saffron.

2. CROCUS *spathâ univalvi pedunculato*, *corollæ tubo brevissimo*. Rush-leaved autumnal Crocus, with a large purplish flower.

3. CROCUS *spathâ bivalvi radicali*, *floribus sessilibus*. Broad-leaved spring Crocus with a variable yellow flower, commonly called Bishop's Crocus.

4. CROCUS *spathâ biflorâ corollæ tubo tenuissimo*. Ordinary, spring, striped Crocus.

There are great variety of these flowers cultivated in gardens, but, as most of them are only feminal variations, so I have not enumerated them here; those which are here mentioned I think must be allowed to be specifically different, since they do not vary to each other.

The first sort is the plant which produces the Saffron, which is a well known drug. This hath a roundish bulbous root, as large as a small Nutmeg, which is a little compressed at the bottom, and is covered with a coarse, brown, netted skin; from the upper part of the root come out the flowers, which, together with the young leaves, whose tops just appear, are closely wrapped about by a thin spatha, or sheath, which parts within the ground, and opens on one side. The tube of the flower is very long, arising immediately from the bulb, without any foot-stalk, and at the top is divided into six oval obtuse segments, which are equal, and of a purple blue colour. In the bottom of the tube is situated a roundish germen, supporting a slender style, which is not more than half the length of the petal, crowned with three oblong golden stigmas (which is the Saffron;) these spread asunder each way; the style is attended by three stamina, whose base are inserted in the tube of the petal, and rise to the height of the style, where they are terminated by arrow-pointed summits. This plant flowers in *October*, and the leaves keep growing all the winter, but it never produces any seeds here.

The second sort grows naturally on the *Alps* and *Helvetican* mountains. This hath a smaller bulbous root than the first, which is more compressed; the flowers appear about the same season with the former, but they rise with a short foot-stalk, having a short spatha, or sheath, just below the flower, which covers it before it expands; the tube of the flower is very short, the petal being divided almost to the bottom, and the segments terminate in acute points; the stamina and style are short, and the leaves of the plant are very narrow. There is a variety of this with a sky blue flower.

The third sort hath a pretty large, compressed, bulbous root, covered with a light brown netted skin, from which arise four or five leaves, like those of the other vernal Crocuses, of a purplish dark colour on their lower parts; from between these come out one or two flowers, of a deep yellow colour, sitting close between the young leaves, never rising above two inches high; these have an agreeable odour: the outer segments of the petal are marked with three black streaks, or stripes, running lengthways from the bottom to the top of the segment; they are narrower than the inner segments: from the double arrangement of these segments, some have called it a double flower. Out of the center of the tube arises a slender style, crowned by a golden stigma, which is broad, flat, and is attended by three slender stamina

stamina of the same length, terminated by yellow summits. After the flower is past, the germen pushes out of the ground, and swells to a roundish three-cornered seed vessel, which opens in three parts, and is filled with roundish brown seeds. This is one of the earliest Crocuses of the spring.

The fourth sort rises with a few very narrow leaves, which are, together with the flower-buds, closely wrapped round by a spatha, or sheath, out of which arise two flowers, one of which hath a longer tube than the other, but these are very slender, and do not rise much above the spatha; there the petal enlarges, and is divided into six obtuse segments, which are of equal size; they are of a dirty white on their outside, with three or four purple stripes in each; the inside of the petal is of a purer white; the stamina and style are nearly the same as those of the former sort. This is one of the earliest sorts which flower in the spring.

The varieties of the autumnal Crocus are,

1. The sweet-smelling autumnal Crocus, whose flowers come before the leaves. *C. B.* This is our second sort.
2. The autumnal mountain Crocus. *C. B.* This hath a paler blue flower.
3. The many-flowering, bluish, autumnal Crocus. *C. B.* This hath many sky blue flowers.
4. The small-flowering autumnal Crocus. *C. B.* This hath a small deep blue flower.

The varieties of the spring Crocus are,

1. Broad-leaved, purple, variegated spring Crocus. *C. B.* This hath broad leaves, and a deep blue flower striped.
2. Broad-leaved Crocus of the spring with a purple flower. *C. B.* This hath a plain purple flower.
3. Broad-leaved spring Crocus with a violet-coloured flower. *C. B.* This hath a large deep blue flower.
4. Spring Crocus with a white flower and purple bottom. *C. B.*
5. Broad-leaved, white, variegated spring Crocus. *C. B.*
6. Broad-leaved spring Crocus, with many purple violet flowers, striped with white. *C. B.*
7. Broad-leaved spring Crocus with an ash-coloured flower.
8. Broad-leaved spring Crocus with a large yellow flower. *C. B.*
9. Broad-leaved spring Crocus with a smaller and paler yellow flower. *C. B.*
10. Broad-leaved spring Crocus with smaller yellow flowers striped with black.
11. Narrow-leaved spring Crocus with a smaller brimstone-coloured flower.
12. Narrow-leaved spring Crocus with a small white flower.

All these varieties of Crocuses are very hardy, and will increase exceedingly by their roots, especially if they are suffered to remain two or three years unremoved; they will grow in almost any soil or situation, and are very great ornaments to a garden early in the spring of the year, before many other flowers appear. They are commonly planted near the edges of borders, on the sides of walks; in doing of which, there should be care taken to plant such sorts in the same line as flower at the same time, and are of an equal growth, otherwise the lines will seem imperfect. When the roots lose their fibres and leaves, they may then be taken up, and kept dry until the beginning of *September*, observing to keep them from vermin, for the mice are very fond of them. In planting these roots (after having drawn a line upon the border) holes are made with a dibble, about two inches deep, or more, according to the lightness of the soil, and two inches distance from each other, in which must be placed the roots, with the bud uppermost; then with a rake fill up the holes in such a manner, as that the upper part of the root may be covered

an inch or more, being careful not to leave any of the holes open; for this will entice the mice to them, which, when once they have found out, will destroy all your roots, if they are not prevented.

This is the way in which these flowers are commonly disposed in gardens: but the better way is, to plant them six or eight near each other in bunches, between small shrubs, or on the borders of the flower-garden, where, if the varieties of these flowers are planted in different patches, and properly intermixed, they will make a much better appearance than when they are disposed in the old method of strait edgings.

The autumnal Crocuses are not so great increasers as those of the spring, nor do they produce seeds in our climate, so that they are less common in the gardens, except the true Saffron, which is propagated for use in great plenty, in many parts of *England*. These may be taken up every third year, as was directed for the spring Crocuses, but should not be kept out of the ground longer than the beginning of *August*, for they commonly produce their flowers in the beginning of *October*; so that if they remain too long out of the ground, they will not produce their flowers so strong, nor in such plenty, as when they are planted early.

CROTOLARIA. *Lin. Gen. Plant.* 771.

The Characters are,

The flower is of the butterfly kind; the standard is large, heart-shaped, and pointed; the wings are oval, and half the length of the standard; the keel is pointed, and as long as the wings; it hath ten stamina, which are united, and an oblong reflexed germen, that after-ward becomes a short turgid pod, with one cell, opening with two valves, and filled with kidney-shaped seeds.

The Species are,

1. CROTOLARIA foliis simplicibus ovatis, stipulis semicordatis, ramis tetragonis. *Flor. Zeyl.* 277. Asiatick Crotolaria with a single-warted leaf and blue flower.
 2. CROTOLARIA foliis simplicibus lanceolatis pilosis, petiolis decurrentibus. American Crotolaria with a winged stalk, hairy leaves, and yellow flowers disposed in loose spikes.
 3. CROTOLARIA foliis oblongo-ovatis hirsutis sessilibus, stipulis acutis pedunculis longioribus. Smaller, hairy, herbaceous, American Crotolaria, with an arrow-shaped stalk.
 4. CROTOLARIA foliis simplicibus, lineari-lanceolatis hirsutis, petiolis decurrentibus, caule fruticoso. Shrubby hairy Crotolaria with a yellow flower, winged branches, and pointed leaves.
 5. CROTOLARIA foliis simplicibus lanceolatis, villosis, argenteis, sessilibus, siliquis pendulis. Asiatick Crotolaria with a silvery, hairy leaf, a yellow flower, and hanging pods disposed in a spike.
 6. CROTOLARIA foliis cordato-ovatis perfoliatis. *Lin. Sp. Plant.* 714. Crotolaria with a Thorough-wax leaf.
 7. CROTOLARIA foliis simplicibus, oblongis cuneiformibus retusis. *Flor. Zeyl.* 276. Asiatick Crotolaria with yellow flowers, and a single heart-shaped leaf.
 8. CROTOLARIA foliis simplicibus ovatis villosis, petiolis simplicissimis, ramis teretibus. *Hort. Cliff.* 357. African Crotolaria with a Storax-tree leaf.
 9. CROTOLARIA foliis ovatis sessilibus, ramis angulatis hirsutis, floribus lateralibus simplicissimis. Crotolaria with oval leaves fitting close to the branches, which are angular and hairy, and single flowers proceeding from the sides of the branches.
- The first sort grows naturally in *India*. This is an annual plant, which hath an herbaceous four-cornered stalk, rising about two feet high, dividing into three or four branches, that have four acute angles, garnished with oval, warted leaves, of a pale green colour, standing on very short foot-stalks. The flowers are produced in spikes at the end of the branches,

branches, which are of the butterfly shape, and of a light blue colour; these are succeeded by short turgid pods, that inclose one row of kidney-shaped seeds.

The second sort grows naturally at *La Vera Cruz* in *New Spain*. This rises with a compressed winged stalk near three feet high, putting out several side branches, garnished with spear-shaped leaves near three inches long, and one broad, covered with soft hairs, sitting close to the branches, alternately; from the foot-stalks of each there runs a border or leafy wing, along both sides of the branches; the flowers are produced in loose spikes at the end of the branches, which are of a pale yellow colour, the standard being stretched out a considerable length beyond the wings. These are succeeded by short turgid pods, which, when ripe, are of a deep blue, having one row of small kidney-shaped seeds, which are of a greenish brown colour.

The third sort grows in *South Carolina*, and in several parts of *America*; this is an annual plant, which rises with a slender stalk a foot and an half high, dividing into three or four spreading branches, garnished with oblong oval leaves sitting close. The upper part of the branches have two leafy borders or wings, running from one leaf to the other, but the lower part of the branches have none; the foot-stalks of the flowers arise from the side of the stalk; they are very slender, and sustain one or two pale yellow flowers at their top, which are not more than half so large as the former sort, and are succeeded by very short turgid pods, in which are inclosed three or four smooth kidney-shaped seeds.

The fourth sort grows naturally in *Jamaica*. It rises with a shrubby taper stalk near four feet high, sending out many side branches which are very slender, ligneous, and covered with a light brown bark; they are garnished with very narrow spear-shaped leaves, which are hairy, and sit close to the branches; the younger shoots have a leafy border or wing on two sides, but the old branches have none; the flowers are produced near the end of the branches, three or four growing alternate on a loose spike, they are of a dirty yellow, and small; the pods which succeed them are about an inch long, very turgid, and of a dark blue when ripe.

The seeds of the fifth sort were brought me from the coast of *Malabar*. This rises with an angular stalk near four feet high, dividing upward into three or four branches, garnished with narrow spear-shaped leaves, placed alternately on very short foot stalks, and are pretty closely covered with soft mealy hairs. The flowers are produced at the end of the branches, in loose spikes; they are large, of a deep yellow colour, and the style stands out beyond the standard. The flowers are succeeded by large turgid pods, containing one row of large kidney-shaped seeds.

This plant is annual in *England*, but by the lower part of the stalk growing woody, it appears to be of longer duration in the country where it naturally grows, though it will not live through the winter here; for if the plants are placed in a stove, the heat is too great for them; and in a green-house, they are very subject to mouldiness in damp weather. I have sown the seeds of this in the full ground, where the plants have grown upward of three feet high, and have flowered very well, but no pods were formed on these; and when they have been treated tenderly, the plants have grown much larger, and produced a greater number of flowers, but these have not been succeeded by seeds. The only way which I could ever obtain any seeds, was by raising the plants in pots upon hot-beds, and the beginning of *July*, turning them out of the pots into the full ground on a very warm border under a wall, in which situation they flowered very well, and a few pods of seeds were ripened.

The sixth sort grows naturally in *South Carolina*, at a

great distance from the *English* settlements. By the description sent me with the seeds, it grows with a shrubby stalk four or five feet high, but the plants which were raised here, perished at the approach of winter, so that they only flowered, without producing any pods.

The seventh sort rises with an herbaceous stalk near three feet high, dividing into several branches, garnished with oblong leaves, which are narrow at their base, but gradually widen to the top, where they are rounded and indented in the middle in the shape of a heart; they are of a pale green, and smooth. The flowers are produced in spikes at the end of the branches, they are pretty large, and of a yellow colour. This grows naturally in the island of *Ceylon*, and is an annual plant, perishing soon after it perfects seeds.

The eighth sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk about five feet high, dividing into several branches, garnished with roundish leaves sitting close; they are of a hoary green, and soft to the touch, the branches are taper and smooth; the flowers are produced at the end of the branches in loose spikes; they are about the size of those of the first sort, and of a fine blue colour.

The ninth sort grows at *Campeachy*; this rises with a taper upright stalk near three feet high, dividing upward into several erect branches, garnished with oval, spear-shaped leaves, of a pale green colour; the flowers are produced singly from the side of the branches, which are of a bright yellow, and are succeeded by short turgid pods, having one row of kidney-shaped seeds.

As most of these plants are annual, so they require to be brought forward in the spring, otherwise the summers are too short for them to perfect seeds in *England*; so that unless the seeds are sown upon a good hot-bed in the spring, and the plants afterward carefully managed, they will not flower well here; for in general, the summers in this country are not very favourable for these tender plants. Therefore in order to have the annual sorts in perfection, there should be a low glass case erected about five or six feet high, which should be made with glasses to open or slide down on every side, as should also the top on both sides, having sliding glasses, that the plants may have sun and air on every side; in this there should be a pit for tanners bark to make a hot-bed, in which may be placed these and other curious tender annual plants, where the sun will constantly shine on them, so long as he makes his appearance above the horizon; and here they may have plenty of free air admitted at all times, when the weather is warm, so may be brought to great perfection, and hereby good seeds may be annually obtained.

These plants naturally grow on sandy light soils, so they should always be planted in such, and the pots in which they are planted, must not be too large, for in such they will not thrive; so that after they have filled the small pots with their roots in which they were first planted, they should be shaken out of those, and put into penny pots, which will be large enough for all the annual kinds. The waterings of these plants should be performed with caution, for too great moisture will rot the fibres of their roots; so that in summer, if they are gently watered three or four times a week in hot weather, it will be sufficient.

CROTON. *Lin. Gen. Pl.* 960. Bastard Ricinus.

The Characters are,

It hath male and female flowers in the same plant; the flowers have five petals, those of the male being no larger than the leaves of the empalement; and have five nectarious glands, which are fixed to the receptacle; they have ten or fifteen stamina, which are joined at their base. The female flowers have a roundish germen, with three reflexed styles. The germen afterward be-

comes a roundish three-cornered capsule, with three cells, each containing a single seed.

The Species are,

1. *CROTON foliis rhombeis repandis, capsulis pendulis caule herbaceo.* Hort. Upsal. 290. Bastard Ricinus, from which the Turnfol of the French is made.

2. *CROTON foliis ovato-lanceolatis, minimè serratis, caule herbaceo hirsuto, floribus alaribus pedunculis longioribus.* Marsh Bastard Ricinus, with oblong sawed leaves, and a prickly fruit.

3. *CROTON foliis inermi-serratis, inferioribus quinquelobis, superioribus trilobis.* Hort. Cliff. 445. Herbaceous Bastard Ricinus, with trifid, or quinquefid sawed leaves.

4. *CROTON tetraphyllum, foliis lanceolatis, acuminatis, subtus cæsiis, caule herbaceo ramoso.* Dwarf Bastard Ricinus, with oblong pointed leaves, gray on their under side, and an herbaceous stalk.

5. *CROTON foliis lanceolatis glabris, caule fruticoso, floribus alaribus & terminalibus.* Shrubby Bastard Ricinus, with a Laurel leaf, and a very large green empalement to the flower.

6. *CROTON foliis cordatis, acuminatis, subtus tomentosis, floribus alaribus sessilibus, caule fruticoso.* Bastard Ricinus, with hairy leaves like those of Poplar.

7. *CROTON foliis lineari-lanceolatis, glabris, subtus argenteis, caule fruticoso, floribus spicatis terminalibus.* Bastard shrubby Ricinus, with narrow leaves, which are whitish on their under side, commonly called wild, or Spanish Rosemary, in Jamaica.

8. *CROTON foliis oblongo-cordatis tomentosis, caule fruticoso ramoso, floribus spicatis terminalibus.* Shrubby American Bastard Ricinus, with a Marshmallow leaf.

9. *CROTON foliis ovatis tomentosis, integris, serratis.* Hort. Cliff. 444. Dwarf Ricinus, with roundish sawed leaves, silvery on their under side, and flowers and fruit growing in clusters.

The first sort grows naturally in the south of France; this is an annual plant, which rises with an herbaceous branching stalk, about nine inches high, garnished with irregular, or rhomboidal figured leaves, which are near two inches long, and one inch and a quarter broad, standing upon slender foot-stalks. The flowers are produced in short spikes from the side of the stalks, the upper part of the spike is composed of male flowers; having many stamina, which coalesce at the bottom; the lower hath female flowers, which have each a roundish three-cornered germen, which afterward becomes a roundish capsule with three lobes, having three cells, each including one roundish seed.

The seeds of this plant should be sown in the autumn, on a border of light earth, in a warm situation, where they are designed to remain, and when the plants come up, they should be thinned where they are too close, leaving them six inches asunder, after this they will require no other care but to keep them clean from weeds. If the summer proves favourable, the plants will flower in July, and in very warm autumns they sometimes perfect their seeds in England.

The second sort was discovered by the late Dr. Houstoun, at La Vera Cruz; this is also an annual plant, which grows naturally in low marshy grounds, where it hath a very different appearance from what it puts on when sown upon dry land; those of the watery places have broad flat stalks, and leaves three inches long, which are scarce a quarter of an inch broad; they are rough, and but little indented on their edges, but those plants upon dry ground have oval leaves three inches long, and upwards of two inches broad, which are sawed on their edges. The flowers are produced at the wings of the leaves, in short loose spikes, having four or five herbaceous male flowers at the top of each, and three or four female flowers at bottom, which are succeeded by roundish capsules with three lobes, covered with a prickly husk, with three cells, each inclosing a single seed.

The third sort was discovered by the same gentleman, at the same place as the former; this is an annual plant, which rises with a taper herbaceous stalk, a foot and an half high, dividing into several branches, garnished with smooth leaves, standing upon very long foot-stalks, which are for the most part placed opposite; the lower leaves are divided deeply into five oblong lobes, and the upper into three, which are slightly sawed on their edges, and end in acute points. The flowers are produced in loose spikes at the end of the branches, those on the upper part being male, and the lower female, they are of a whitish herbaceous colour; the female flowers are succeeded by oblong capsules, having three lobes, which open in three parts, having three cells, each containing one oblong seed.

The fourth sort grows naturally at the Havannah. This is an annual plant, which rarely grows more than nine inches high, dividing into two or three branches; the lower parts of the branches are garnished with four leaves placed in form of a cross, two of which are three inches long, and one inch broad near their base, ending in acute points; these stand opposite, and the other two leaves between these are about two inches long, and a quarter of an inch broad; they are of a light green on their upper side, and of a gray or Ash-colour on their under. The flowers are produced in long loose spikes at the top of the stalks; the upper part of these spikes have male, and the lower female flowers, of an herbaceous colour; the female flowers are succeeded by round capsules with three cells, each containing one roundish seed.

The fifth sort grows naturally in Jamaica. It rises with a shrubby stalk to the height of seven or eight feet, covered with an Ash-coloured bark, dividing into many slender branches upward, which are naked below, but toward their upper part are garnished with smooth spear-shaped leaves, about two inches and an half long, and three quarters of an inch broad, standing on pretty long foot-stalks; the flowers are produced in short spikes at the end of the branches, in the same manner as the former; they are of an herbaceous colour, and inclosed in large green empalements.

The sixth sort grows in Jamaica. This rises with a shrubby stalk seven or eight feet high, sending out many irregular branches, covered with an Ash-coloured bark, garnished with heart-shaped leaves, near four inches long, and two inches broad, ending in acute points; they are of a light green on their upper side, but woolly on their under, standing on slender foot-stalks, sometimes single, and at others, two or three arise from the same joint. The flowers are produced in short spikes from the side of the branches, they are of a whitish green colour, and the female flowers are succeeded by capsules, having three cells, each including a single seed.

The seventh sort grows naturally in Jamaica. This rises with a shrubby stalk about six or seven feet high, sending out many side branches, which are covered with a smooth bark, of a pale yellow colour, garnished closely with narrow stiff leaves, near three inches long, and about one eighth of an inch broad, of a light green on their upper side, but the under side is the same colour as the bark. Between the branches arise a long loose spike of whitish green flowers. The whole plant hath an aromattick odour when rubbed. The upper part of the spike hath male flowers, the lower female; the seeds grow in roundish capsules having three cells, each including a single seed.

The eighth sort grows naturally in Jamaica. This rises with a shrubby stalk six or seven feet high, dividing into several branches, whose bark is covered with a yellowish down, and are garnished with long heart-shaped leaves, ending in acute points, standing on long foot-stalks, covered on both sides with a woolly down of the same colour as the branches. The flowers are produced on long close spikes at the end of the branches; the male flowers, which

are situated on the upper part of the spikes, have white flowers of one leaf, divided into five parts almost to the bottom. The female flowers, on the lower part of the spikes, have large woolly empalements, and are succeeded by round capsules with three cells, each including a single seed.

The ninth sort grows naturally at *Campeachy*. This is an annual plant, which rises with an herbaceous stalk two feet and an half high, dividing into several small branches, garnished with oval woolly leaves, near three inches long, and two and an half broad in the middle. The flowers are produced at the extremity of the branches, in short close spikes or clusters, sitting close between the leaves; they are small, of a whitish green colour; the female flowers are succeeded by small round capsules, inclosed by the woolly empalement; they have three cells, but seldom more than one of them contains seeds, which must be gathered as soon as they are ripe, otherwise they will scatter.

All these plants, except the first, are natives of warm countries, so will not thrive in *England*, unless they are tenderly treated. They are propagated by seeds; those which are annual perfect their seeds in *England*, but the shrubby sorts very rarely arrive to that perfection. The seeds must be sown on a hot-bed early in the spring, and when the plants are fit to remove, they should be each transplanted into a small pot, and plunged into a moderate hot-bed of tanners bark, where they should be shaded from the sun till they have taken fresh root; then they must have air admitted to them daily, in proportion to the warmth of the season. After the plants are grown too tall to remain in the frames, they should be removed, either into the stove, or a glass case, where there is a hot-bed of tanners bark, into which the pots should be plunged, and there the annual sorts will flower and perfect their seeds; but the shrubby kinds must be removed into the bark stove in the autumn, and during the winter season they should have but little water.

As the perennial sorts retain their leaves all the year, so they make a pretty variety in winter, when they are intermixed with other plants, whose leaves are of different forms and colours from these.

CROWN IMPERIAL. See *Ptellium*.

CRUCIANELLA. *Lin. Gen. Plant.* 118. Petty Madder.

The Characters are,

The flower hath one petal, with a slender cylindrical tube, longer than the empalement, cut into four parts at the brim. It hath four stamina situated in the mouth of the tube. It hath a compressed germen, situated at the bottom of the tube, which afterward becomes two twin capsules, each containing one oblong seed.

The Species are,

1. CRUCIANELLA *erecha*, foliis senis linearibus. *Hort. Ups.* 27. Petty Madder with a narrower leaf.

2. CRUCIANELLA *procumbens*, foliis quaternis lanceolatis, floribus spicatis. *Hort. Upsal.* Broad-leaved Petty Madder.

3. CRUCIANELLA *procumbens*, foliis quaternis, floribus subverticillatis. *Lin. Sp. Pl.* 109. Maritime Petty Madder.

The first sort grows naturally in the south of *France* and *Italy*; it is an annual plant, which rises with several upright stalks a foot high, which have six or seven very narrow linear leaves, placed in whorls at each joint. The flowers grow in close spikes at the top and from the side of the branches; these are small, white, and not longer than the empalement, so make no great appearance.

The second sort grows in the islands of the *Archipelago*, and also about *Montpelier*; this is also an annual plant, sending out several branching stalks from the root, which lie prostrate, and are garnished with four spear-shaped leaves at each joint. The flowers are produced in long spikes at the extremity of the branches; they are very small, so make no appearance.

The third sort is like the second in the appearance of its leaves and stalks, but the flowers grow on the side of the stalks, almost in whorls, and make little appearance. This grows naturally on the borders of the sea, in the south of *France* and *Italy*.

These three sorts are preserved in some gardens for the sake of variety: if the seeds are sown on a bed of light earth in the spring, where they are designed to remain, they will require no other culture, but to thin them where they are too close, and keep them clean from weeds; or if the seeds are permitted to scatter, the plants will come up in the spring, and require no other treatment; they are all annual plants.

CRUCIATA. See *Valantia*.

CRUPINA BULGARUM. See *Serratula*.

CUCUBALUS. *Lin. Gen. Plant.* 502. Berry-bearing Chickweed.

The Characters are,

The flower hath five petals, with tails as long as the empalement, but spread open at the top, and ten stamina, five of which are alternately inserted in the tail of the petals. In the center is situated the oblong germen, supporting three styles. The empalement afterward becomes a pointed close capsule with three cells, opening at top in five parts, and filled with many roundish seeds.

The Species are,

1. CUCUBALUS *calycibus campanulatis, petalis distantibus, fructu colorato, ramis divaricatis.* *Lin. Sp. Pl.* 414. Climbing Berry-bearing Chickweed.

2. CUCUBALUS *caulibus erectis glabris, calycibus subglobosis, staminibus corollâ longioribus.* Wild Lychnis, or white Behen of the shops, commonly called Spattling Poppy.

3. CUCUBALUS *calycibus subglobosis, caule ramoso patulo, foliis linearibus acutis.* Wild Lychnis or Spattling Poppy, with narrower pointed leaves.

4. CUCUBALUS *calycibus subglobosis glabris reticulato-venosis, capsulis trilocularibus corollis subnudis.* *Flor. Suec.* 360. Swedish Lychnis with a leaf and appearance of white Behen, having a large empalement, called Gumsepungar.

5. CUCUBALUS *caulibus procumbentibus, calycibus amplissimis nervosis, foliis lanceolatis.* English Sea Lychnis.

6. CUCUBALUS *caulibus procumbentibus, calycibus amplissimis reticulato-venosis, floribus pentagynis.* English Sea Lychnis with larger leaves

7. CUCUBALUS *foliis obovatis carnosiss.* *Prod. Leyd.* 448. Rocky maritime Lychnis with an Orpine leaf.

8. CUCUBALUS *floribus lateralibus decumbentibus, caule indiviso, foliis basi reflexis.* *Lin. Sp. Pl.* 414. Greater perennial Night-flowering Lychnis of *Dover*.

9. CUCUBALUS *foliis quaternis.* *Hort. Upsal.* 110. Lychnis with smooth Gentian leaves, four at each joint embracing the stalk, and a large fringed flower.

10. CUCUBALUS *calycibus striatis acutis petalis bipartitis, caule paniculato, foliis linearibus.* Narrow-leaved, sweet-scented, Night-flowering Lychnis.

11. CUCUBALUS *floribus dioicis, petalis setaceis indivisis.* *Hort. Cliff.* 272. Viscous Lychnis with a mossy flower.

12. CUCUBALUS *acaulis.* *Flor. Lapp.* 184. Alpine Dwarf Lychnis with a grassy flower, or Alpine Moss with a flower of Lychnis.

13. CUCUBALUS *petalis bipartitis, floribus paniculatis, staminibus longis, foliis lanceolatis acutis.* Tallest Lychnis with the appearance of Wild Campion.

The first sort grows naturally in *France*, *Germany*, and *Italy*, in shady places, and is seldom kept in gardens, unless for the sake of variety; it sends out many climbing stalks, which grow four or five feet high, where they meet with support, otherwise they trail on the ground; these stalks send out side branches by pairs, opposite, at each joint; the leaves are like those of Chickweed, and are placed

placed opposite. The flowers come out single at the end of the branches, which have large inflated empalements; they consist of five petals, which are white, and are placed at a distance from each other; these are succeeded by oval berries, which, when ripe, are black and full of juice, inclosing several flat shining seeds. This hath a perennial creeping root, whereby it is apt to multiply too fast in gardens. It delights in shade, and will thrive in almost any soil.

The second sort grows naturally in most parts of *England*, where it is generally called Spattling Poppy. This stands in the catalogue of medicinal plants, under the title of *Beben album*; the roots of it are sometimes used, and are accounted cordial, cephalick, and alexipharmick. It hath a perennial root, which strikes deep into the ground, so that they are not easily destroyed by the plough, therefore it is frequently seen growing in bunches among Corn. It is a rambling weed, so is never cultivated. There are two varieties of this, one with smooth, the other hath hairy leaves.

The third sort grows naturally on the *Alps*; this differs from the former, in having much longer and narrower leaves, and the stalks being more divided and spreading, nor do the roots creep under ground like those of the former. These differences are constant from seeds.

The fourth sort grows naturally in *Sweden*, and some other northern countries, where it passes for the common sort, but is certainly a distinct species, and I have been informed has been found growing naturally in *England*. The stalks of this are much larger, the leaves longer and more pointed; the empalement of the flower is curiously veined like net work, of a purplish colour, whereas that of the common sort is plain. These differences are lasting, when the plants are cultivated in a garden.

The fifth sort grows naturally on the borders of the sea, in many parts of *England*. This is by some supposed to be the same as the second sort, from which it greatly differs; the stalks of this are weak, and trail upon the ground; the leaves are shorter, those upon the stalks are much broader, and the empalement of the flowers are netted with purple veins like the *Swedish* sort before-mentioned.

The sixth sort was found growing naturally in some parts of *England*. This differs from the last, in having much longer trailing stalks, and larger leaves; the petals of the flowers are more than twice the size of those, and the flowers have five styles. These differences are lasting. All these sorts have perennial roots, and multiply too fast in gardens, therefore are never admitted but into botanick gardens for variety.

The seventh sort was discovered by *Tournefort* in the *Levant*. This puts out many oval, thick, succulent leaves near the ground, out of the middle of which arises an upright stalk about fifteen inches high, the lower part of which is garnished with leaves of the same form and consistence as Orpine, but smaller; they are placed opposite; the upper part of the stalk divides into two smaller, on which stand a few small herbaceous flowers at each joint. The plant is biennial, generally perishing when it has produced seeds; but unless it is sown upon dry rubbish, in a warm situation, the plants will not live through the winter in *England*; for when they are in good ground, they grow large, and are so replete with moisture, as to be affected by the first frost in the autumn; but where they have grown upon an old wall, I have known them escape, when all those were killed which grew in the ground.

The eighth sort grows naturally upon the cliffs near *Dover*. This hath a perennial root, from which arises single stalks about a foot high, garnished with long narrow leaves placed opposite; the flowers are produced from the side of the stalks, each foot-stalk sustaining three flowers; the foot-

stalks come out by pairs; the empalement of the flower is long and striped, the flowers are of a pale red.

The ninth sort grows naturally in *Virginia*, and several other parts of *North America*. This hath a perennial root, from which arise two or three slender upright stalks about three feet high, garnished with four leaves at each joint, placed in form of a cross; they are smooth, of a deep green, about an inch and an half long, and half an inch broad, terminating in acute points; the joints of the upper part of the stalk are garnished with white fringed flowers, standing single upon pretty long foot-stalks, which come out by pairs opposite.

The tenth sort grows naturally in *Spain* and *Italy*. This is a perennial plant, which rises with an upright branching stalk a foot and an half high, garnished with very narrow leaves placed opposite; the upper part of the stalk is very branching; the flowers stand upon long naked foot-stalks, each supporting three or four flowers, which have long tubes, with striped empalements; the petals are large, and deeply divided at the top; they are of a pale bluish colour. The flowers are closed all day, but when the sun leaves them they expand, and then they have a very agreeable scent. This sort may be propagated by seeds, which should be sown in the spring, upon a bed of light earth; and when the plants are fit to remove, they should be planted in a nursery bed, at about four inches distance, where they may remain till autumn, when they may be planted in the borders of the flower garden, where they are designed to remain. The following summer these will produce their flowers, and ripen their seeds in the autumn; but the roots will continue several years, provided they are not planted in rich ground, where they are very subject to rot in winter.

The eleventh sort grows naturally in *Austria*, *Silesia*, and *Italy*. This sort is male and female in different plants; it hath a thick, fleshy, perennial root, which strikes deep into the ground, sending out many oblong leaves, narrow at their base; from between these arise the stalks, which in the male plants often grow four feet high, but those of the female plants are seldom above three; the stalks are garnished with narrow leaves placed opposite; at the joints there exudes a viscous clammy juice, which sticks to the fingers when handled; and the small insects which settle upon those parts of the stalks, are thereby fastened so as not to get loose again. The flowers of the male plants, are produced in loose spikes from the joints of the stalk in clusters; these are small, of a greenish colour, and have each ten stamina. The female plants have three or four flowers growing upon each foot-stalk, which arise from the side of the stalk. These are succeeded by oval seed vessels, containing many small seeds. This is propagated by seeds, which should be sown where the plants are designed to remain; for as they send out long tap roots, so they do not bear transplanting, unless it is performed while the plants are young.

The twelfth sort grows naturally on the *Alps*, and also upon some hills in the north of *England* and *Wales*. This is a very low plant, with small leaves, which spread on the ground, and have the appearance of Moss; the flowers are small, erect, and rarely rise more than half an inch high; they are of a dirty white colour, and appear in *May*. This is a perennial plant, which will not thrive but in a moist soil and a shady situation.

The thirteenth sort grows naturally in *Italy* and *Sicily*. This is a perennial plant, with large thick roots, sending out many long spear-shaped leaves; between these arise round viscous stalks, which grow four or five feet high, garnished at each joint by two long narrow leaves ending in acute points. The stalks branch out into many divisions; the foot-stalks of the flowers arise from each joint by pairs; each

each of these sustain three or four flowers of an herbaceous colour, whose petals are divided into two parts. This is propagated by seeds in the same manner as the eleventh.

CUCUMIS. *Lin. Gen. Pl.* 969. Cucumber.

The Characters are,

It hath male and female flowers on the same plant. The flowers are bell-shaped, of one petal, which adheres to the empalement, and is cut into five oval rough segments. The male flowers have three short stamina, which are inserted in the empalement. The female flowers have no stamina, but have three small pointed filaments without summits. The germen is situated under the flower, which afterward becomes an oblong fleshy fruit with three cells, including many oval flat pointed seeds.

The Species are,

1. CUCUMIS *foliorum angulis rectis, pomis oblongis scabris.* *Hort. Cliff.* 451. The common Garden Cucumber.

2. CUCUMIS *foliorum angulis rectis, pomis longissimis scabris.* The long Turkey Cucumber.

3. CUCUMIS *foliis rotundato-angulatis, pomis acutangulis.* *Lin. Sp. Pl.* 1011. Round-leaved Egyptian Cucumber, called Chate.

The first sort is the Cucumber which is generally cultivated for the table, and is so well known as to need no description.

The second sort is the long Turkey Cucumber, which is also pretty well known in *England*. The stalks and leaves of this sort are much larger than those of the common sort. The fruit is generally twice the length, and hath a smooth rind; this is undoubtedly different from the common sort. There are green and white fruit of this, and also of the common sort, which differ but little except in their colour. The white is less watery than the green, so is generally better esteemed.

The third sort here enumerated, is rarely cultivated, but in botanick gardens for the sake of variety, the fruit being very indifferent, and the plants being tender, require a good heat to bring them to perfection in *England*; these plants ramble very far, so must have much room.

The common sort is cultivated in three different seasons: the first of which is on hot-beds under garden frames, for early fruit; the second is under bell or hand glasses, for the middle crop; and the third is in the common ground, for a late crop, or to pickle.

I shall begin with giving directions for raising Cucumbers early, which is what most gentlemen's gardeners have an emulation to exceed each other in; and some have been at the pains and expence to have ripe fruit in every month of the year, which is rather a curiosity than real advantage; but as there are many persons, who yet value themselves on their skill in raising early Cucumbers, so we may probably be censured as being deficient in what they call an essential part of gardening, should we omit the method practised for raising these fruit early in the year; therefore shall proceed to give such directions, which, if carefully attended to, will not fail of success.

Those persons who are very desirous to be early with their Cucumbers, generally sow their seeds before *Christmas*, but the generality of gardeners commonly put their seeds into the hot-bed about *Christmas*; but where persons have the conveniency of a stove for raising these plants, it is attended with less trouble than a common hot-bed, and is a much surer method, because the plants will have a much greater share of air than under frames; therefore when there is this convenience, the seeds may be sown in small pots, and plunged into the tan bed, in the warmest part of the stove. The seeds should be at least three or four years old, but if it is more, provided it will grow, it will be the better. When the plants are up, and begin to put out their rough leaf, there should be a sufficient number of small pots filled

with good earth, and plunged into the bark bed, that the earth may be warmed to receive the plants, which should be pricked into these pots, two plants in each; but when they have taken root and are safe, one of the worst should be drawn out, being careful not to disturb the roots of that which is left. In the management of these plants there must be great care taken, not to give them too much water, and it will be very proper to put the water into the stove some hours before it is used, that the cold may be taken off, but there must be caution used, not to make it too warm, for that will destroy the plants; they must also be guarded from the moisture which frequently drops from the glasses of the stove, which is very hurtful to these plants while young; then there should be a proper quantity of new dung prepared for making a hot-bed to receive them; this must be in proportion to the quantity of holes or plants intended: for a middling family six or nine lights of Cucumbers will be sufficient, and for a large family double the quantity. The dung should be new, and not too full of straw; it should be well mixed together, and thrown in a heap, mixing some sea coal ashes with it; after it hath lain in a heap a few days, and has fermented, it should be carefully turned over and mixed, laying it up again in a heap; and if there is a great share of straw in it, there may be a necessity for turning it over a third time after having lain a few days; this will rot the straw and mix it thoroughly with the dung, so there will be less danger of its burning when the bed is made, which should be done when the dung is in proper order. The place where the hot-bed is made should be well sheltered with Reed hedges, and the ground should be dry; then there should be a trench made in the ground, of a proper length and breadth, and a foot deep at least, into which the dung should be wheeled and carefully stirred up and mixed, so that no part of it should be left unseparated; for where there is not this care taken, the bed will settle unequally; there should also be great care taken, to beat the dung down close in every part of the bed alike; when the bed is made, the frames and glasses should be put upon it to keep out the rain, but there should be no earth laid upon the dung, till two or three days after, that the steam of the dung may have time to evaporate: if there should be any danger of the bed burning, it will be proper to lay some short old dung, or some neats dung, over the top of the hot dung about two inches thick, which will keep down the heat, and prevent the earth from being burnt. The usual quantity of dung allowed for making of the beds at this season, is one good cart load to each light: in about three days, the bed will be in a proper temperature of heat to receive the plants; at which time the dung should be covered over with dry earth about two inches thick, and in the middle of the bed it should be a foot thick. This should be laid upon the dung two or three days before the plants are removed into the bed, that the earth may be properly warmed; then the plants should be carefully shaken out of the pots, preserving all the earth to their roots, and placed on the top of the earth in the middle of the bed. Two of these plants will be sufficient for each light, and these should be placed at about seven or eight inches asunder, but not all their roots together, as is too often practised. When the plants are thus situated in the bed, the earth which was laid a foot thick in the middle of the bed, should be drawn up round the ball which remained to the roots of the plants, into which the roots will soon strike; there should always be a magazine of good earth laid under cover to keep it dry, for the earthing of these beds, for if it is taken up wet, it will chill the beds, and also occasion great damps in the bed, therefore it is quite necessary to have a sufficient quantity of earth prepared long before it is used. When the plants are thus settled, they must have proper air

and water, according to the weather, being careful not to admit too much cold air, or give too much water; the glasses should also be well covered with mats every night, to keep up the warmth of the bed, and some fresh earth should be put into the bed at different times, which should be laid at some distance from the roots of the plants, till it is warmed, and then should be drawn up round the heap of earth in which the plants grow: this should be raised to the full height of the former ball, that the roots of the plants may more easily strike into it; by this method of supplying the earth, the whole surface of the beds will be covered a foot deep with earth, which will be of great service to the roots of the plants; for where the earth is very shallow, the leaves of the plants will always hang in the heat of the day, unless they are shaded; and the plants will require more water to keep them alive, than is proper to give them; therefore, it will be found much the better way to allow a proper depth of earth to the beds: by thus gradually applying the earth it will be fresh, and much better for the roots of the plants, than that which has been long upon the bed, and has been too much moistened by the steam arising from the dung.

If the heat of the bed should decline, there should be some hot dung laid round the side of the bed to renew the heat; for if that should fail at the time that the fruit appears, they will fall off and perish, therefore this must be carefully regarded; and when the plants have put out side branches (which the gardeners call runners) they should be properly placed, and pegged down with small forked sticks to prevent their rising up to the glasses, and also from crossing and entangling with each other; so that when they are properly directed at first, there will be no necessity of twisting and tumbling the plants afterward, which is always hurtful to them.

When the earth of the bed is laid the full thickness, it will be necessary to raise the frames, otherwise the glasses will be too close to the plants; but when this is done, there must be care taken to stop the earth very close round the sides of the frame, to prevent the cold air from entering under them. The watering of the plants and admitting fresh air to them must be diligently attended to, otherwise the plants will be soon destroyed, for a little neglect either of admitting air, or letting in too much, or by over watering, or starving the plants, will very soon destroy them past recovery.

When the fruit appears upon the plants, there will also appear many male flowers on different parts of the plant; these may at first sight be distinguished, for the female flowers have the young fruit situated under them, but the male have none, but have three stamina in their center, with their summits, which are loaded with a golden powder; this is designed to impregnate the female flowers; and when the plants are fully exposed to the open air, the soft breezes of wind convey this farina or male powder from the male to the female flowers; but in the frames, where the air is frequently too much excluded at this season, the fruit often drops off for want of it: and I have often observed that bees which have crept into the frames when the glasses have been raised to admit the air, have supplied the want of those gentle breezes of wind, by carrying the farina of the male flowers on their hind legs into the female flowers, where a sufficient quantity of it has been left to impregnate them. These insects have taught the gardeners a method to supply the want of free air, which is so necessary for the performance of this in the natural way; this is done by carefully gathering the male flowers, at the time when this farina is fully formed, and carrying them to the female flowers, turning them down over them, and with the nail of one finger gently striking the outside of the male, so as to cause the powder on the summits to scatter into the female flowers,

and this is found sufficient to impregnate them; so that by practising this method, the gardeners have now arrived at a much greater certainty than formerly to procure an early crop of Cucumbers and Melons; and by this method the florists have arrived to greater certainty of procuring new varieties of flowers from seeds, which is done by the mixing of the farina of different flowers into each other.

When the fruit of the Cucumbers are thus fairly set, if the bed is of a proper temperature of warmth, they will soon swell and become fit for use; so all that is necessary to be observed, is to water the plants properly, which should be done, by sprinkling the water all over the bed, for the roots of the plants will extend themselves to the side of the beds; therefore those who are inclined to continue these plants as long as possible in vigour, should add a sufficient thickness of dung and earth all round the sides of the beds, so as to enlarge them to near double their first width; this will supply nourishment to the roots of the plants, whereby they may be continued fruitful great part of the summer; whereas, when this is not practised, the roots of the plants, when they have reached the side of the beds, are dried by the wind and sun, so that the plants languish and decay long before their time.

Those gardeners, who are fond of producing early Cucumbers, generally leave two or three of their early fruit, which are situated upon the main stem of the plant near the root for seed, which, when fully ripe, they carefully save to a proper age for sowing, and by this method they find a great improvement is made of the seed; and this they always use for their early crops only, for the succeeding crops do not deserve so much care and attention.

I have here only mentioned the method of raising the young Cucumber plants in stoves, for as these conveniences are now pretty generally made in the curious kitchen gardens in most parts of *England*, so this method may be more universally practised; but in such gardens where there are no stoves, the seeds should be sown upon a well prepared hot-bed; and here it will be the best way to sow the seeds in small halfpenny pots, because these may be easily removed from one bed to another if the heat should decline, or, on the contrary, if the heat should be too great, the pots may be raised up, which will prevent the seed or the young plants from being injured thereby. When the plants are come up, as was before directed, there should be a fresh hot-bed prepared, with a sufficient number of halfpenny pots plunged therein ready to receive the plants, which must be planted into them in the same manner as before directed; and the after-management of the plants, must be nearly the same; but as the steam of the hot-bed frequently occasions great damps, so there must be great care to turn and wipe the glasses frequently, to prevent the condensed moisture falling on the plants, which is very destructive to them. There must also be great attention to the admitting fresh air at all proper times, as also to be careful in keeping the bed to a proper temperature of heat; for as there is a want of fire to warm the air, so that must be supplied by the heat of dung; afterward these plants must be ridged out, in the same manner as before directed.

About the middle of *March*, or a little later, according to the carliness of the season, you must put in your seeds for the second crop, which may be sown either under a bell glass, or in the upper side of your early hot-bed; and when the plants are come up, they should be pricked upon another moderate hot-bed, which should be covered with bell or hand glasses, placed as close as possible to each other; the plants should be set about two inches distance from each other, observing to shade them until they have taken root. This is to be understood of such places where a great quantity of plants are required, which is constantly the case in

the kitchen gardens near *London*; but where it is only for the supply of a family, there may be plants enough raised on the upper side of the beds where the first crop is growing: you must raise the glasses on the opposite side from the wind, to give air to the plants every day when the weather is warm, which will greatly strengthen them; you must also water them as you shall find they require it, but this must be done sparingly while the plants are young.

About the middle of *April* the plants will be strong enough to ridge out, you must therefore be provided with a heap of new dung, in proportion to the quantity of holes you intend to plant, allowing one load to five or six holes. When your dung is fit for use, you must dig a trench about two feet four inches wide, and in length just as you please, or the place will allow; and if the soil be dry, it should be ten inches deep, but if wet, very little in the ground, levelling the earth in the bottom; then put in your dung, observing to stir and mix every part of it as was directed for the first hot-beds, laying it close and even.

When this is done, you must cover the ridge over with earth about four inches thick, laying the earth the same thickness round the sides, raising hills in the middle at three feet and an half asunder; then you must set the glasses upon the hills, leaving them close down about twenty-four hours, in which time the earth in the hills will be warmed sufficiently to receive the plants; then with your hand stir up the earth, making it a little hollow in the middle in form of a basin; into each of which you should plant four plants, observing to water and shade them until they have taken root; after which time you must be careful to give them air by raising the glasses on the opposite side to the wind, in proportion to the heat of the weather, but you must only raise the glasses in the middle of the day, until the plants fill the glasses, at which time you should raise the glasses with a forked stick on the south side in height proportionable to the growth of the plants, that they may not be scorched by the sun; this also will harden and prepare the plants to endure the open air, but you should not expose them too soon thereto, for it often happens, that there are morning frosts in *May*, which are many times destructive to these plants when exposed thereto; it is therefore the surest method to preserve them under the glasses, as long as they can be kept without prejudice to the plants; and if the glasses are raised with three bricks, they may be kept a great while without danger.

Towards the latter end of *May*, when the weather appears settled and warm, you should turn the plants down gently out of the glasses, but do not perform this in a very dry hot sunny day, but rather when there is a cloudy sky, and an appearance of rain; in doing of this raise the glasses either upon three bricks, or three forked sticks, whereby they may stand secure at about four or five inches high from the ground, that the plants may lie under them without bruising; nor should you take the glasses quite away till the latter end of *June*, or the beginning of *July*, for these will preserve the moisture much longer to their roots than if they were quite exposed to the open air; about three weeks after you have turned the plants out of the glasses, they will have made a considerable progress, especially if the weather has been favourable, at which time you should dig up the spaces of ground between the ridges, laying it up to the sides of the bed, that the roots of the plant may strike into it; then lay out the runners of the vines in exact order, and be careful in this work not to disturb the vines too much, nor to bruise or break the leaves. After this there will be no farther care needful, but only to keep them clear from weeds, and to water them as often as they shall require, which they will soon shew, by the hanging of their greater leaves. The ridges thus managed, will continue to produce

large quantities of fruit from *June* until the latter end of *August*.

From these ridges people commonly preserve their Cucumbers for seed, by making choice of one or two of the fairest fruit upon each hole, situated near the root of the plant; but those persons who value themselves upon producing Cucumbers very early, commonly leave three or four Cucumbers of the first produce of their earliest crop, when the fruit is fair; and the seeds of these early fruit, are generally preferred to any other for the first crop. These should remain upon the vines until the seeds are perfectly ripe; and when you gather them from the vines, it will be proper to set the fruit in a row upright against a hedge or wall, where they may remain until the outer cover begins to decay; at which time you should cut them open, and scrape out the seeds, together with the pulp, into a tub, which should be afterwards covered with a board, to prevent filth from getting amongst the pulp. In this tub it should be suffered to remain eight or ten days, observing to stir it well with a stick to the bottom every day, in order to rot the pulp, that it may be easily separated from the seeds; then pour some water into the tub, stirring it well about, which will raise the scum to the top, but the seeds will settle to the bottom; so that by two or three times pouring in water, and afterwards straining it off from the seeds, they will be perfectly cleared from the pulp; then they should be spread upon a mat, which should be exposed to the open air three or four days, until they are perfectly dry, when they may be put up in bags, and hung up in a dry place, where vermin cannot come to them, where they will keep good for several years, but are generally preferred when three or four years old, as being apt to produce less vigorous, but more fruitful plants.

I shall, in the next place, proceed to give directions for managing Cucumbers for the last crop, or what are generally called picklers.

The season for sowing these is in the beginning of *June*, when the weather is settled. The ground where these are commonly sown by the *London* gardeners, is between the wide rows of Cauliflowers, which are four feet and an half asunder. In these rows they dig up square holes at about three feet and an half distance from each other, breaking the earth well with a spade, and afterwards smoothing and hollowing it in the form of a basin with their hands; then they put eight or nine seeds into the middle of each hole, covering them over with earth about half an inch thick; if the weather is very dry, they water the holes gently in a day or two after the seeds are sown, in order to facilitate their vegetation.

In five or six days, if the weather is good, the plants will begin to thrust their heads above ground; at which time they are careful to keep off the sparrows, which are very fond of the young tender heads of these plants; and, if they are not prevented, will pinch them off, and thereby destroy the whole crop: but as it is not above a week that the plants are in this danger, it will be no great trouble to look after them during that time; for when the plants have expanded their seed leaves, the sparrows will not meddle with them.

There must also be care taken to water them gently, as the season may require; and when the third or rough leaf of the plants begin to appear, all the weakest plants should be drawn out, leaving only four of the most promising and best situated in each hole, stirring the earth round about them with a small hoe to destroy the weeds, and raise the earth about the shanks of the plants, putting a little earth between them, pressing it gently down with the hand, that the plants may be thereby separated from each other to a greater distance; then they give them a little water (if the weather

weather is dry) to settle the earth about them, which must be afterwards repeated as often as it shall be necessary, still being careful to keep the ground clear from weeds.

When the Cauliflowers are quite drawn off the ground from between the Cucumbers, they hoe and clean the ground, drawing the earth up round each hole of Cucumbers in form of a basin, the better to contain the water when it is given them; then lay out the plants in exact order as they are to run, so that they may not interfere with each other; then lay a little earth between the plants left, pressing it down gently with the hand, the better to spread them each way, giving them a little water to settle the earth about them, repeating it as often as the season shall require. The plants, thus managed, will begin to produce fruit toward the latter end of *July*, or the beginning of *August*, when they either gather them young for pickling, or suffer them to grow for large fruit.

The quantity of holes necessary for a family, is about fifty or sixty; for if there are fewer, they will not produce enough at one gathering to make it worth the trouble and expence of pickling, without keeping them too long in the house, for there are rarely more than two hundred fit to gather at each time from fifty holes; but this may be done twice a week during the whole season, which commonly lasts five weeks; so that from fifty holes may be reasonably expected about two thousand in the season, which, if they are taken small, will not be too many for a private family. And if so many are not wanted, they may be left to grow to a proper size for eating.

CUCUMIS AGRESTIS. See Momordica.

CUCURBITA. *Lin. Gen. Plant.* 968. The Gourd.

The Characters are,

It hath male and female flowers in the same plant. The male flowers have three stamina, which are connected at their extremity, but are distinct at their base. The female flowers have a large germen, situated under them, supporting a conical trifid style, which afterward becomes a large fleshy fruit, having three soft membranaceous cells which are distinct, inclosing two rows of seeds which are bordered.

The Species are,

1. CUCURBITA foliis subangulatis tomentosis, basi subtus biglandulosis, pomis lignosis. *Lin. Sp. Plant.* 1010. Long Gourd, with a soft leaf and white flower, commonly called the Long Gourd.

2. CUCURBITA foliis lobatis, pomis lævibus. *Lin. Sp. Pl.* 1010. Greater round Gourd, with a yellow flower and rough leaf, commonly called Pompion, or Pumpkin.

3. CUCURBITA foliis lobatis, pomis nodoso-verrucosis. *Lin. Sp. Pl.* 1010. Warty Gourd.

4. CUCURBITA foliis lobatis, caule erecto, pomis depresso-nodosis. *Lin. Sp. Plant.* 1010. Melopepo having a shield-shaped fruit, commonly called Squash.

The first sort is sometimes propagated in the *English* gardens by way of curiosity, for the fruit is very rarely eaten here; though, if they are gathered when they are young, while the skins are tender, and boiled, they have an agreeable flavour. In the eastern countries these fruit are very commonly cultivated and sold in the markets for the table, and are a great part of the food of the common people, from *June* to *October*.

This sort doth not vary like most of the others, but always produces the same shaped fruit; the plants of this extend to a great length, if the season proves warm and favourable, and will then produce ripe fruit; but in cold summers, the fruit seldom grows to half its usual size. I have measured some of these fruit when growing, which were six feet long, and a foot and an half round; the plants were near twenty feet in length: the stalks of this, and also the leaves, are covered with fine soft hairy down;

the flowers are large, white, and stand upon long foot stalks, being reflexed at their brim; the fruit is generally incurved and crooked, and when ripe, is of a pale yellow colour. The rind of this fruit becomes hard, so that if the seeds and pulp are taken out, and the shell dried, it will contain water; and in those countries where they are much cultivated, are used for many purposes.

The second sort, which is commonly known by the title of Pumpkin, is frequently cultivated by the country people in *England*, who plant them upon their dunghills, where the plants run over them, and spread to a great distance; and when the seasons are favourable, they will produce plenty of large fruit; these they usually suffer to grow to maturity, then they cut out a hole on one side, and take the seeds out of the pulp as clean as possible, after which they fill the shell with Apples sliced, which they mix with the pulp of the fruit, and some add a little sugar and spice to it; then bake it in an oven, and eat it in the same manner as baked Apples; but this is a strong food, and only fit for those who labour hard, and can easily digest it.

Both these may be propagated by sowing their seeds in *April*, on a hot-bed; and the plants transplanted on another moderate bed, where they should be brought up hardily, and have a great deal of air to strengthen them; and when they have got four or five leaves, they should be transplanted into holes made upon an old dunghill, or some such place, allowing them a great deal of room to run, for some of the sorts will spread to a great distance.

There are several varieties of this fruit, which differ in their form and size; but as these are annually varying from seeds, so I have omitted the mentioning them, for they seldom continue to produce the same kinds of fruit three years together.

The third sort is very common in most parts of *America*, where it is cultivated as a culinary fruit; of this sort there are also several varieties, which differ in their form and size; some of these are flat, others round; some are shaped like a bottle, and others are oblong, their outer cover or rind being white, when ripe, and covered with large protuberances or warts. The fruit are commonly gathered when they are half grown, and boiled by the inhabitants of *America* to eat as a sauce with their meat.

The fourth sort is also very common in *North America*, where it is cultivated for the same purposes as the third. This very often grows with a strong bushy erect stalk, without putting out runners from the side, as the other sorts, but frequently varies; for after it has been cultivated a few years in the same garden, the plants will become trailing like the others, and extend their branches to a great distance.

CUIETE. See Crescentia.

CUMINOIDES. See Lagoecia.

CUMINUM. *Lin. Gen. Pl.* 313. Cumin.

The Characters are,

It hath an umbelliferous flower; the involucre is longer than the umbel. The great umbel is uniform; the flowers have five unequal petals, whose borders are inflexed, and five single stamina, with a large germen situated under the flower, supporting two small styles, which afterward becomes an oval striated fruit, composed of two oval seeds, which are convex and furrowed on one side, and plain on the other.

We have but one Species of this genus,

CUMINUM. *Lin. Mat. Med.* 139. Cumin.

This plant is annual, perishing soon after the seeds are ripe; it seldom rises more than nine or ten inches high, in the warm countries where it is cultivated; but I have never seen it grow more than four in *England*, where I have sometimes had the plants come so far as to flower very well, but never to produce seeds. The leaves of this plant are divided

vided into long narrow segments, like those of Fennel, but much smaller; they are of a deep green, and generally turn backward at their extremity; the flowers grow in small umbels at the top of the stalks; they are composed of five unequal petals, which are of a pale bluish colour, and are succeeded by long channelled aromack seeds.

This plant is propagated for sale in the island of *Malta*, where it is called *Cumino aigro*, i. e. hot Cumin. But Anise, which they also propagate in no less quantity, they call *Cumino dulce*, i. e. sweet Cumin. So that many of the old botanists were mistaken, when they made two species of Cumin, viz. *acer* and *dulce*.

If the seeds of this plant are sown in small pots, and plunged into a very moderate hot-bed to bring up the plants, and these after having been gradually inured to the open air, turned out of the pots, and planted in a warm border of good earth, preserving the balls of earth to their roots, the plants will flower pretty well, and by thus bringing of the plants forward in the spring, they may perfect their seeds in warm seasons.

CUNILA. See Sideritis.

CUNONIA. *Buttn. Cun. tab. 1.*

The Characters are,

The flowers grow alternate in an imbricated spike, each having a spathe or sheath; they have one ringent petal, with a short slender tube, which is dilated at the chaps and compressed on the sides; the upper lip is arched, stretched out beyond the alæ or wings. It hath three slender stamina, which are situated in the upper lip, and a slender style, which is shorter than the stamina, crowned by three cylindrical stigmas. The germen, which is situated below the flower, becomes an oblong capsule with three cells, filled with compressed seeds.

We have but one Species of this genus at present in the English gardens, which is,

CUNONIA floribus sessilibus, spatibus maximis. *Buttn. Cun. 211. tab. 1.* Cunonia with flowers sitting close to the stalk, and very large spathe or sheaths.

This plant grows naturally at the *Cape of Good Hope*. It hath a compressed bulbous root, somewhat like that of Corn Flag, covered with a brown skin: from this arise several narrow sword-shaped leaves, about nine inches long, and a quarter of an inch broad, terminating in acute points; these have one longitudinal midrib which is prominent, and two longitudinal veins running parallel on each side; they are of a sea-green colour. In spring the stalk rises from between the leaves, which is round, strong, and jointed; at each joint is situated a single leaf, which almost embraces the stalk, which rises near a foot and an half high, and is generally curved two opposite ways; the upper part of the stalk is terminated by a loose spike of flowers, coming out of large spathe or sheaths, composed of two oblong concave leaves, terminating in acute points: these are at their first appearance placed *imbricatim* over each other, but as the stalk increases in length, so these are separated; from between these two leaves comes out the flower, which having a slender Saffron-coloured tube near half an inch long, which is then enlarged where the petal is divided, and the upper segment is extended two inches in length, being arched over the stamina and style. This is narrow as far as to the extent of the wings, but above them is enlarged and spread open, half an inch in length, and is concave, covering the summits and stigmas, which are extended to that length; the two wings are also narrow at their base, but are enlarged upward in the same manner, ending in concave obtuse points, which are compressed together, and cover the stamina and style. This flower is of a beautiful soft scarlet colour, so makes a fine appearance about the latter end of *April*, or beginning of *May*, which is the season of its flowering. After the flowers decay, the germen becomes an

oval smooth capsule opening in three cells, which are filled with flat bordered seeds.

This plant is easily propagated by offsets, which it sends out in great plenty, or by sowing of the seeds, which should be sown in pots about the middle of *August*, and placed in a situation where they may enjoy the morning sun; in *September* the pots may be removed to a warmer situation, and in *October* they must be placed under a frame, where they may be protected from frost and hard rains, but in mild weather enjoy the free air. The plants will appear in *October*, and continue growing all the winter, and in *June* their leaves will decay; then they may be taken up, and planted in halfpenny pots. As this plant is a native at the *Cape of Good Hope*, so it is too tender to live through the winter in *England* without shelter from frost; the best way to have this and other bulbous-rooted flowers from the same country in perfection, is to build a frame of a proper depth, to allow room for the stalks of their flowers to rise to their usual height under the glasses, and make a bed of good fresh earth two feet deep, into which the roots should be planted; and here they may be protected from frost, and in mild weather fully exposed to the open air, so will thrive and flower much better than when they are placed in a green-house in winter. But where such a frame is wanting, the roots should be planted in pots, and sheltered in winter under a common hot-bed frame, that they may always have free air in mild weather. These seedling plants must be sheltered in the same manner as the old roots in winter, and the third year they will flower.

CUPRESSUS. *Lin. Gen. Pl. 958.* The Cypress tree.

The Characters are,

It hath male and female flowers on the same plant; the male flowers are formed into oval katkins, in which the flowers are placed thinly; they have no petals nor stamina, but have four summits which adhere to the bottom of the scales. The female flowers are formed in a roundish cone, each containing eight or ten flowers; the germen is scarce visible, but afterward becomes a globular cone, opening in angular target-shaped scales, under which are situated angular seeds.

The Species are,

1. CUPRESSUS foliis imbricatis, ramis erectioribus. Female or common upright Cypress.
2. CUPRESSUS foliis imbricatis acutis, ramis horizontalibus. Male spreading Cypress.
3. CUPRESSUS foliis imbricatis, apicibus aculeatis, ramis dependentibus. Portugal spreading Cypress with a smaller fruit.
4. CUPRESSUS foliis distichis patentibus. *Hort. Cliff. 409.* Virginia Cypress which sheds its leaves, commonly called Deciduous Cypress.
5. CUPRESSUS foliis imbricatis, frondibus ancipitibus. *Lin. Sp. Plant. 1003.* Dwarf Maryland Cypress with a small blue fruit.
6. CUPRESSUS foliis linearibus simplicibus cruciatim positis. Cypress with narrow, single leaves, placed crossways.

The first of these trees is very common in most of the old gardens in *England*, but at present is not so much in request as formerly, though it is not without its advantages; nor should it be entirely rejected, although some persons are of that opinion; for it is of great beauty to wildernesses, or clumps of evergreens, and where they are properly disposed they have much beauty; for they are one of the principal ornaments of the *Italian villas*.

The second sort is the largest growing tree, and is the most common timber in the *Levant*: this, if planted upon a warm sandy gravelly soil, will prosper wonderfully; and though the plants of this sort are not so finely shaped as the first, yet they greatly recompense for that defect, by its vigorous growth, and strength in resisting all weathers. Besides,

sides, the wood of this tree is very valuable, when grown to a size fit for planks; which I am convinced it will do, in as short space as Oaks, if properly cultivated for that purpose; since there are many places in *England* where the soil is of a sandy or gravelly nature, so seldom produces any trees worth cultivating. Now, in such places these would thrive wonderfully, and greatly add to the pleasure of the owner, while growing, and afterward render as much profit to his successors, as perhaps the best plantation of Oaks; especially should the timber prove as good here, as in the islands of the *Archipelago*, which I see no reason to doubt of; for we find it was so gainful a commodity in the island of *Candia*, that the plantations were called *Dos Filiae*; the felling of one of them being reckoned a daughter's portion.

The timber of this tree is said to resist the worm, moth, and all putrefaction, and also to last many hundred years. The coffins were made of this material, in which *Thucydides* tells us the *Athenians* used to bury their heroes.

The fourth sort is a native of *America*, where it grows in watery places, rising to a prodigious height, and is of a wonderful bulk: I have been informed, that there are trees of this kind in *South Carolina* which are upwards of seventy feet high, and several fathoms in circumference, which trees grow constantly in the water; therefore they may probably be of singular advantage to plant in such swampy or wet soils, where few other trees will grow, especially of the resinous kind.

These trees are all propagated from seeds, which should be sown early in the spring in pots or boxes, which, if placed in a very moderate hot-bed will bring up the plants soon; or if the seeds are sown upon a moderate hot-bed, and the beds covered with mats, they will come up much sooner, and with greater certainty, than when they are sown in the cold ground.

In these pots, boxes, or this bed, the young plants may remain one year, by which time they will have strength enough to be transplanted, either into boxes, or a warm border; for while the plants are young, they are tender, so should be covered in severe frost with mats to prevent their being injured thereby. The best season for removing them is in the beginning of *April*, when the drying easterly winds of *March* are over; and, if possible, choose a cloudy day, when it is inclinable to rain; and in taking them out of the seed bed or pots preserve the roots as entire as possible, and, if you can, some earth to each plant; having prepared the border by carefully digging and cleansing it from all noxious weeds, you must lay it level. Then draw the lines where the plants are to be planted, at one foot asunder, row from row, and the cross lines at six inches distance in the rows; the plants must be set exactly in the squares, closing the earth to their roots, and water them well to settle the earth to them; which should be repeated in dry weather twice a week, until the plants have taken fresh root.

These plants may remain in the borders two years, according to the progress they make, but if you intend to let them remain longer, you should take up every other tree in the rows, and transplant them out; for otherwise their roots will be matted together, so that it will render it difficult to transplant them, and also endanger their future growth. These plants should by no means be let stand too long in the nursery, before they are transplanted out for good; because they rarely grow when their roots are much cut, for the roots of the *Cypress* are apt to extend out in length, so it is one of the most difficult trees to remove when grown large; therefore most curious persons choose to plant the young plants into small pots, when they first take them out of the border; and so train them up in pots two or three years,

until they are fit to plant out, where they are to stand for good; and, by this management, they are secure of all the plants; and these may be shaken out of the pots at any time of the year without danger, and planted with their whole ball of earth, which is likewise a great advantage. When they are planted out for good (if they are designed for timber,) they should be planted about ten or twelve feet distance every way. When they are planted, you must settle the earth close to their roots, as before, laying a little mulch upon the surface of the ground about their stems, to prevent the sun and wind from entering the earth to dry their fibres; and water them well, to settle the ground to their roots; which must also be repeated (if the weather be dry) until they have taken root; after which time, they will require little more care than to keep them clear from weeds.

The first, which is the most common sort in *England*, seldom produces good seeds in this country; it is therefore the best way to have the cones brought over entire from the south parts of *France* or *Italy*, where they ripen perfectly well, and take the seeds out just before you sow them, for they will keep much better in the cones than if they are taken out. The method to get the seeds out is to expose the cones to a gentle heat, which will cause them to open, and easily emit their seeds.

The second sort grows naturally in the *Levant*, for what has passed under this title in many places here, is only a variety of the common sort, whose branches grow much looser, and not so upright as the first; but the cones taken from these trees, and the seeds sown, have frequently produced plants of both varieties; but the spreading *Cypress* extends its branches much more horizontally, and the plants raised from the seeds do not vary, so that it is certainly a distinct species. This grows to be a large timber tree in the *Levant*, and in *Italy* there are some of a considerable size.

The *Virginian* kind may also be propagated in as great plenty; for the cones of this may be easily procured from *Carolina* or *Virginia*, in both which places they grow in great abundance; and the seeds will rise as easily as any of the other sorts, and the plants are equally as hardy. As this tree grows in places where the water commonly covers the surface of the ground three or four feet, so it may be a very great improvement to our boggy soils, were they planted with them. It may also be propagated by cuttings, which should be planted in a bed of moist earth, in the spring; before the trees begin to shoot.

The third sort is, at present, pretty rare in the *English* gardens, though of late years there have been many plants raised in the nurseries; but this sort is not quite so hardy as the common *Cypress*, for the plants are frequently killed or greatly injured in severe winters; and in the hard frost in 1740, there were few trees in *England* of this kind, which were not entirely killed. There are great plenty of these trees growing at a place called *Busaco*, near *Coimbra* in *Portugal*, where this tree is called the Cedar of *Busaco*; and there it grows to be a timber tree, so that from thence the seeds may be easily procured.

But its natural place of growth is at *Goa*, from whence it was first brought to *Portugal*, where it has succeeded, and been propagated; formerly there were some trees of this sort growing in the bishop of *London's* garden at *Fulham*, where it passed under the title of Cedar of *Goa*, by which it was sent from thence to the *Leyden* garden under that name.

The fifth sort is a native of *North America*, where it grows to a considerable height, and affords an useful timber to the inhabitants for many purposes. This sort is extremely worth cultivating in *England*; for as it grows in a much colder country, there is no danger of its thriving well

in the open air in *England*; and being an ever-green of regular growth, will add to the variety in wilderness quarters, or other plantations of ever-green trees.

The branches of this tree are garnished with flat ever-green leaves, resembling those of the *Arbor Vitæ*; and the cones are no larger than Juniper berries, from which they are not easily distinguished at a little distance; but upon closely viewing, they are easily distinguished to be perfect cones, having many cells, like those of the common Cypress. If these trees are planted in a moist strong soil, they make very great progress; and may, in such situations, become profitable for timber; but however this tree may succeed for timber, yet it will be a great ornament to large plantations of ever-green trees, especially in such places where there is naturally a proper soil for them; because, in such situations, there are not many sorts of ever-green trees which thrive so well, especially in cold places; and by increasing the number of sorts of these ever-greens, we add to the beauty of our gardens and plantations.

The sixth sort grows naturally at the *Cape of Good Hope*, and by the accounts which I received with the seeds, the cones of the tree are black when ripe. The young plants which I have raised from seeds have loose spreading branches, which are closely garnished with narrow strait leaves, which come out opposite, and are alternately crossing each other; these are one inch long, of a light green colour; and continue in verdure all the year. These plants being young, are too tender to thrive in the open air in *England* as yet, but when they have obtained more strength, it is very probable they may do well in warm situations.

CURCUMA. *Lin. Gen. Plant.* 6. Turmeric.

The Characters are,

The flowers have spathæ, which are single and drop off; they have one petal with a narrow tube, which is cut at the brim into three segments; and an oval-pointed nectarium of one leaf, inserted in the sinus of the largest segment; it hath five stamina, four of which are barren, and one is fruitful, which is situated within the nectarium. It hath a roundish germen situated under the flower, which afterward becomes a roundish capsule having three cells, which are filled with roundish seeds.

The Species are,

1. CURCUMA foliis lanceolato-ovatis, nervis lateralibus rarissimis. *Lin. Sp. Pl.* 2. Turmeric with a round root.

2. CURCUMA foliis lanceolatis nervis lateralibus numerosissimis. *Lin. Sp. Pl.* 2. Turmeric with a long root.

The first sort hath a fleshy jointed root, somewhat like that of Ginger, but rounder; which sends up several spear-shaped oval leaves, which rise upwards of a foot high, with one longitudinal midrib, and a few transverse nerves running to the sides; they are of a sea-green colour; from between these arise the flower-stalk, supporting a loose spike of flowers of a pale yellowish colour, inclosed in several different spathæ or sheaths, which drop off. These flowers are never succeeded by seeds in the gardens here.

The second sort hath long fleshy roots of a deep yellow colour, which spread under the surface of the ground, like those of Ginger; they are about the thickness of a man's finger, having many round knotty circles, from which arise four or five large spear-shaped leaves, standing upon long foot-stalks; they have a thick longitudinal midrib, from which a numerous quantity of veins are extended to the sides. The flowers grow in loose scaly spikes on the top of the foot-stalks, which arise from the larger knobs of the roots, and grow about a foot high; they are of a yellowish red colour, and shaped somewhat like those of the *Indian Reed*.

These plants grow naturally in *India*, from whence the roots are brought to *Europe* for use. They are very tender, so will not live in this country, unless they are placed in a warm stove. They are propagated by parting of their roots;

the best time for removing and parting these roots is in the spring, before they put out new leaves, for the leaves of these plants decay in autumn, and the roots remain inactive till the spring, when they put out fresh leaves; these roots should be planted in pots, which should be constantly kept plunged in a bark-bed in the stove. In the summer season, when the plants are in a growing state, they will require to be frequently refreshed with water, but it should not be given to them in large quantities; they should also have a large share of air admitted to them in warm weather; but when the leaves are decayed they should have very little wet, and must be kept in a warm temperature of air, otherwise they will perish.

CURRENT-TREE. See Ribes.

CURURU. See Paullinia.

CUSTARD-APPLE. See Anona.

CYANUS. See Centaurea.

CYCLAMEN. *Lin. Gen. Plant.* 184. Sowbread.

The Characters are,

The flower hath one petal with a globular tube; the upper part is divided into five large segments which are reflexed; it hath five small stamina situated within the tube of the petal; it hath a roundish germen supporting a slender style, which afterward becomes a globular fruit with one cell, opening in five parts at the top, inclosing many oval angular seeds.

The Species are,

1. CYCLAMEN foliis hastato-cordatis angulatis. Sowbread with an Ivy leaf.

2. CYCLAMEN foliis orbiculato-cordatis, infernè purpurascens. Round-leaved Sowbread, with a purple under side.

3. CYCLAMEN foliis cordatis serratis. This is the heart-shaped Spring, or *Persian Cyclamen*.

4. CYCLAMEN foliis cordatis angulosis integris. Winter and spring flowering Sowbread, with a large angular leaf, and a white flower purple at the bottom, called *Persian Cyclamen*.

5. CYCLAMEN radice inæquali, foliis orbiculatis. Sowbread with a root the size of a Chestnut.

6. CYCLAMEN foliis orbiculatis planis, pediculis brevibus floribus minoribus. Winter Cyclamen with orbicular leaves, red on their under side, and a purplish flower; or the *Coum* of the herbalists.

The first sort is the most common in the *English* gardens; this grows naturally in *Austria*, *Italy*, and other parts of *Europe*, so will thrive in the open air in *England*, and is never hurt by the frost; it hath a large, orbicular, compressed root, from which arise a great number of angular heart-shaped leaves upon single foot-stalks, which are six or seven inches long, marked with an angular circle of black in their middle: the flowers appear before the leaves, rising immediately from the root; they appear in *August* and *September*, and soon after the leaves come out, and continue growing all the winter and spring till *May*, when they begin to decay; after the flowers are fallen, the foot-stalks twist up like a screw, inclosing the germen in the center, and lay down close to the surface of the ground between the leaves, which serve as a protection to the seed; this germen becomes a round fleshy seed vessel, with one cell, inclosing several angular seeds, which ripen in *June*, and should be sown in *August*. There are two varieties of this, one with a white and the other with a purplish flower, which appear at the same time.

The second sort flowers in autumn; this is at present rare in *England*; the leaves of this sort are large, orbicular, heart-shaped at their base, and of a purple colour on their under side; the leaves and flowers of this come up from the root at the same time; the flowers are of a purplish colour, and their bottoms are of a deep red; it flowers late in the autumn, and requires protection from the frost in winter.

The

The third sort hath stiff heart-shaped leaves, which are sawed on their edges, and have strong fleshy foot-stalks of a purple colour; the flowers rise with single foot-stalks from the root; these are pure white, with a bright purple bottom; the petal is divided into nine segments to the bottom, which are twisted and reflexed backward like the other sorts; this flowers in *March* and *April*, and the seeds ripen in *August*.

The fourth sort is commonly called the *Persian* Cyclamen; this hath large, angular, heart-shaped leaves; which are veined and marbled with white on their upper side, and stand upon pretty long foot-stalks; the flowers are large, of a pale purple colour, with a bright red or purple bottom; these appear in *March* and *April*, and the seeds ripen in *August*.

The fifth sort hath a small irregular root, not larger than a nutmeg; the leaves are orbicular and small; the flowers are of a flesh colour, small, and have purple bottoms; they appear in the spring, but rarely produce seeds in *England*.

The sixth sort is not so tender as the four last-mentioned, so may be planted in warm borders, where, if they are covered in hard frost, they will thrive and flower very well; it hath plain orbicular leaves, which have shorter and weaker foot-stalks than either of the other; their under sides are very red in the beginning of the winter, but that colour goes off in the spring; their upper sides are smooth, of a lucid green, and spread open flat, whereas the other sorts are hollowed, and reflexed at their base; the flowers are of a very bright purple colour, and appear in the middle of winter, at a time when there are few other flowers, which renders the plants more valuable; the seeds of this sort ripen in the end of *June*.

There are some other varieties of this plant, which chiefly differ in the colour of their flowers, particularly among the *Persian* kind, of which there is one with an entire white flower, which smells very sweet; but as these are accidental variations, so I have not enumerated them, those which are here mentioned being undoubtedly distinct species.

All the sorts are propagated by seeds, which should be sown soon after they are ripe in boxes or pots, and covered about half an inch deep, placing them where they may have only the morning sun till the beginning of *September*, when they may be removed to a warmer exposure. Those of the first sort may be plunged into the ground, close to a south wall, a pale or Reed-hedge in *October*, where, if it should be very severe frost, it will be proper to cover them either with mats or Pease haulm; but in common winters they will not require any. The pots or tubs, in which the *Persian* kinds are sown, should then be placed under a common hot-bed frame, where they may be protected from frost and hard rains; but in mild weather, the glasses may be taken off every day to admit fresh air to them; those of the *Persian* kinds will come up early in the spring, and continue green till *June*, when they will begin to decay; then they should be removed to an east aspect, where they will have only the morning sun; in which situation they may remain till the middle of *August*, during which time they should have very little water, as the roots are then in an inactive state, when much wet will rot them; in the beginning of *October* there should be some fresh earth spread over the tubs or pots, and then they should be removed again into shelter in the same manner as before; and the following summer they must be managed also in the same way till their leaves decay, when they should be carefully taken up, and those of the first sort planted in a warm border at four or five inches distance; but the other sorts must be planted in pots or tubs, to be sheltered in winter.

The third, fourth, and fifth sorts, are more impatient of cold and wet than the three other; these must constantly be preserved in pots, and sheltered in winter either under common hot-bed frames, or in an airy glass-case, where they

may enjoy as much free open-air as possible, in mild weather; for if they are crowded under other plants, and are kept too close, they are very subject to mould and rot; nor should they have much water in winter, which is also very injurious to them; but whenever they want water, it should be given them sparingly. In summer these plants may be exposed to the open air, when their green leaves will decay, at which time you should remove them to a place where they may have the morning sun until eleven o'clock; but during the time that the roots are destitute of leaves, they should have very little water given them, because at that season they are not capable of discharging the moisture; when their leaves are decayed; it is the proper season to transplant the roots, or to fresh earth them; and as the autumn comes on, that the heat decreases, they may be removed into places more exposed to the sun, where they may remain until *October* before they need be sheltered.

Toward *Christmas*, if the roots are in good health, the sixth sort will begin to flower, and continue producing fresh flowers until the middle of *February*; these will be succeeded by the *Persian* sorts, which continue till *May*; but if you intend to have good seeds, the pots of these sorts should be placed so as to receive a great share of fresh air; for if their flowers are drawn up weak, they seldom produce good seeds. The seeds are ripe about *July*, when they should be immediately sown in pots or cases of good light undunged earth; which should be sheltered in winter under a frame, and exposed in summer in the same manner as is directed for the older roots. When they are two years old, they should be taken up, and each root planted in a small separate pot, in which they may remain two years; then they should be removed into pots a size larger, to give them room, and in about four or five years time they will begin to flower, when they must be put into larger pots.

Several of these sorts have been planted under warm walls in the full ground, where, in mild winters they have succeeded very well, but in severe frost they have been destroyed; therefore, whenever these roots are planted in an open border, there should be common hot-bed frames placed over them in winter, or some other covering, that they may be screened from frost: and when they are thus managed, the plants will produce more flowers, and those will be much fairer, than what are produced from the roots in the pots, and from these there may always be good seeds expected. Therefore, such persons who are curious in flowers, should have a border framed over on purpose for these; and the *Guernsey* and *Belladonna* Lilies, with some other of the curious bulbous-rooted flowers; in which borders there may be many of these curious flowers cultivated, to more advantage than in any other method now practised.

CYDONIA. *Tourn. Inst. R. H.* 632. The Quince tree.

The Characters are,

The flower is composed of five large roundish concave petals, which are inserted in the permanent empalement. The germen is situated under the flower; it hath five slender styles, with twenty stamina. The germen afterward becomes a pyramidal or roundish fruit, which is fleshy and divided into five cells, in which are lodged several hard kernels or seeds.

The Species are,

1. CYDONIA foliis oblongo-ovatis subtus tomentosis, pomis oblongis basi productis. Quince tree with oblong oval leaves, woolly on their under side, and an oblong fruit lengthened at their base; commonly called the Pear Quince.
2. CYDONIA foliis ovatis, subtus tomentosis, pomis rotundioribus. Quince tree with oval leaves, woolly on their under side, and a rounder fruit; commonly called the Apple Quince.
3. CYDONIA foliis obverse-ovatis subtus tomentosis. Quince tree with obverse oval leaves, woolly on their under side, commonly called the Portugal Quince.

The *Portugal Quince* is the most valuable, the pulp of it turning to a fine purple when stewed or baked, and becomes much softer and less austere than the others, so is much better for making of marmalade.

All the sorts are easily propagated, either by layers, suckers, or cuttings, which must be planted in a moist soil. Those raised from suckers, are seldom so well rooted as those which are obtained from cuttings or layers; and are subject to produce suckers again in greater plenty, which is not so proper for fruit bearing trees. The cuttings should be planted early in the autumn, on a moist border. The second year after they should be removed into a nursery at three feet distance row from row, and one foot asunder in the rows, where they must be managed as was directed for Apples. In two years time these trees will be fit to transplant, where they are to remain for good; which should be either by the side of a ditch, river, or some other moist place, where they will produce a greater plenty, and much larger fruit than in a dry soil; though those in the dry soil will be better tasted, and earlier ripe. The trees require very little pruning; the chief thing to be observed is, to keep their stems clear from suckers, and cut off such branches as cross each other; likewise all upright luxuriant shoots from the middle of the tree should be taken entirely out, that the head may not be too much crowded with wood, which is of ill consequence to all sorts of fruit trees. If they are propagated by budding, or grafting upon stocks raised by cuttings, to multiply the best sorts, the trees so raised will bear fruit much sooner and be more fruitful, than those which come from suckers or layers,

Quince stocks are also in great esteem for to graft and bud Pears on; which on a moist soil will greatly improve some sorts, especially those designed for walls and espaliers: for the trees upon these stocks do not shoot so vigorously as those upon free stocks, and therefore may be kept in less compass, and are sooner disposed to bear fruit: but hard winter fruits do not succeed so well upon these stocks, their fruit being very subject to crack, and are commonly stony, especially all the breaking Pears, but more especially if they are planted in dry ground; therefore these stocks are only proper for the melting Pears, and for a moist soil. The best stocks are those which are raised from cuttings or layers.

As the Pear will take upon the Quince by grafting or budding, and so *vice versa*, we may conclude there is a near alliance between them; but as neither of these will take upon the Apple, nor that upon either of these, so we should separate them under different genera, as will be farther mentioned under the article *MALUS*.

CYNANCHUM. *Lin. Gen. Pl.* 268. Bastard Dogsbane.

The Characters are,

The flower hath one petal, which is spread open, plain, and divided into five parts; the nectarium, which is situated in the center of the flower, is erect, cylindrical, and the length of the petal. It hath five stamina, which are parallel to the nectarium, and an oblong bifid germen; the empalement becomes a capsule with two oblong pointed pods, which open longitudinally, and are filled with seeds lying over each other imbricatim, crowned with long down.

The Species are,

1. *CYNANCHUM caule volubili herbaceo, foliis cordato-oblongis glabris. Hort. Cliff.* 79. *Montpelier Periploca* with acute-pointed leaves, commonly called *Montpelier Scammony*.

2. *CYNANCHUM caule volubili herbaceo, foliis reniformi-cordatis acutis. Hort. Cliff.* 79. *Montpelier Periploca* with rounder leaves, or round-leaved *Montpelier Scammony*.

3. *CYNANCHUM caule volubili infernè suberoso fisso, foliis cordatis acuminatis. Hort. Cliff.* 79. *Carolina Periploca* with a smaller starry flower.

4. *CYNANCHUM caule volubili fruticoso, infernè suberoso fisso, foliis ovato-cordatis. Hort. Cliff.* 79. *Periploca* with a climbing stalk, a Citron leaf, and a large fruit.

5. *CYNANCHUM caule erecto divaricato, foliis cordatis glabris. Hort. Cliff.* 79. Upright Dogsbane with a roundish leaf.

6. *CYNANCHUM caule volubili fruticoso, foliis cordatis acutis asperis, floribus lateralibus.* Climbing Dogsbane with heart-shaped rough leaves, and large, yellow, spreading flowers.

7. *CYNANCHUM caule scandente, foliis cordatis acuminatis glabris.* Dogsbane of *Bithynia* climbing to the tallest trees, having a roundish leaf.

The first and second sorts grow naturally at *Montpelier*; they have perennial creeping roots, but annual stalks, which twist themselves like Hops, round whatever plants are near them, and rise to the height of six or eight feet; the first of these has oblong, heart-shaped, smooth leaves, ending in acute points, placed by pairs on long foot-stalks; the flowers come out in small bunches from the wings; they are of a dirty white colour, divided into five acute segments, which spread open in form of a star. They appear in *June* and *July*, but are not succeeded by any seed vessels in *England*, which may be occasioned by their roots creeping so far under ground.

The second sort differs from the first in the shape of its leaves, which are broader and rounder at their base. The roots of this sort are very thick, running deep into the ground, so that where this plant hath gotten possession of the ground it is not easily extirpated. Both these plants abound with a milky juice like the Spurge, which issues out where-ever they are broken; and this milky juice when concreted, has been frequently sold for Scammony.

These plants propagate too fast by their creeping roots, when they are admitted into gardens, so few people care to preserve them: the roots may be transplanted any time after their stalks decay.

The third sort grows naturally in *Carolina*; this is a perennial plant with twining hairy stalks, which, if supported, will rise six or seven feet high; the lower part of the stalks are covered with a thick fungous bark, somewhat like cork, which is full of fissures; the stalks are slender, and garnished at each joint with two oblong, heart-shaped, pointed leaves, standing on long hairy foot-stalks. The flowers are produced in small bunches at the wings of the leaves, which are star-shaped and green when they first appear, and afterward fade to a worn-out purple colour.

This plant will live in the open air in *England*, if it is planted in a dry soil and warm situation. It may be propagated by laying down some of the young shoots about *Midsummer*, which, if they are now and then refreshed with water, will put out roots, so may be transplanted in autumn, where they are designed to remain. The roots of this plant should be covered in winter with some rotten tan to keep out the frost, otherwise in severe winters they are liable to be destroyed.

The fourth sort grows naturally in *Jamaica*. This rises with a twining stalk to the height of twenty feet or upward, provided it hath support; the lower part of the stalks are covered with a thick fungous bark, full of fissures, which gape open; the leaves are oblong and smooth, and placed by pairs, standing upon long foot-stalks: the flowers are produced from the wings of the leaves in small bunches, they are star-shaped, and of a yellowish green colour, but are not succeeded by pods in *England*.

This is tender, so will not thrive in this country unless it is placed in a warm stove, and requires the same treatment as other tender plants from the same country. It is propagated by laying down of the young shoots, which in three or four months will put out roots, and may then be transplanted into pots, and plunged into the tan bed in the bark stove, where the plants should continue all the year.

The fifth sort grows naturally in *Syria*; this is a perennial plant, which rises with slender upright stalks about three feet

feet high, which are garnished with broad, smooth, heart-shaped leaves, ending in points, placed opposite; the flowers come out from the wings of the leaves in small bunches, standing on branching foot-stalks; these are small and white, greatly resembling those of the common white *Afclepias*, or Swallow-wort, and are succeeded by oblong taper pods, filled with flat seeds crowned with down, but these rarely ripen in this country.

It is propagated by parting of the root; the best time for doing of this or transplanting of the roots, is in the Spring, before they shoot: it requires a warm situation, otherwise it will not live abroad in *England*.

The sixth sort grows naturally at *La Vera Cruz* in *New Spain*; this hath a shrubby twining stalk, which twists about any prop that is near it, and rises to the height of twenty feet or upward; the stalks are very slender, and are armed with small stinging hairs, and garnished with broad heart-shaped leaves, which end in acute points, placed by pairs at each joint, and have slender foot-stalks; they are covered with rough hairs on their under side; the flowers are produced in small clusters, sitting close to the side of the stalks; they are pretty large, yellow, and star-shaped, spreading open to the bottom; and are succeeded by long swelling pods, filled with flat seeds lying *imbricatim*, which are crowned with long down.

This sort is tender, so requires the same treatment as the fourth, and is propagated the same way.

The seventh sort grows naturally in *Bithynia*. This rises with a pretty strong stalk, which fastens itself to any neighbouring tree, and mounts up to the top, garnished with broad, heart-shaped, smooth leaves, standing upon long foot-stalks; they are generally placed opposite, but sometimes there are three leaves arising from the same joint, one of which hath a much longer foot-stalk than the other two. The flowers come out from the wings of the leaves, standing upon pretty long branching foot-stalks; they are star-shaped, and of a pale yellowish colour.

This sort must be planted in a warm situation, otherwise it will not live through the winter in *England*. It requires the same treatment as the fifth sort, but may be propagated by laying down the young shoots in the same manner as the fourth sort.

CYNARA. *Lin. Gen. Plant.* 835. Artichoke.

The Characters are,

It hath a compound flower, made up of many hermaphrodite florets, included in one common scaly empalement. The florets are tubulous, equal, and uniform, divided at the top into five narrow segments. They have five short hairy stamina. At the bottom of each is situated an oval germen, which afterwards becomes a single, oblong, compressed, four-cornered seed, crowned with long hairy down.

The Species are,

1. CYNARA foliis subspinosis, pinnatis indivisisque, calycinis squamis ovatis. *Lin. Sp. Plant.* 827. The green or French Artichoke.

2. CYNARA foliis pinnatis inermibus, calycinis squamis obtusis emarginatis. The Globe Artichoke.

3. CYNARA foliis spinosis, omnibus pinnatifidis, calycinis squamis ovatis. *Lin. Sp. Pl.* 827. The Cardoon.

4. CYNARA foliis spinosis, pinnatifidis, subtus tomentosis, calycibus squamis subulatis. *Lin. Sp. Pl.* 828. Wild Artichoke of Spain.

The first sort is commonly known here by the title of French Artichoke, being the sort which is most commonly cultivated in *France*. The leaves of this sort are terminated by short spines, the head is oval, and the scales do not turn inward at the top, like those of the Globe Artichoke, they are also of a green colour; the bottoms of these are not near so thick of flesh as those of the Globe, and have a perfumed taste, which to many persons is very disagreeable,

so it is very seldom cultivated in the gardens near *London*, where the Globe or Red Artichoke is the only sort in esteem. The leaves of this are not prickly; the head is globular, a little compressed at the top; the scales lie close over each other, and their ends turn inward, so as to closely cover the middle.

The culture of these having been fully treated under the article ARTICHOKE, the reader is desired to turn to that, to avoid repetition.

The Chardoon, or Cardoon, is propagated in the kitchen gardens to supply the markets; this is annually raised from seeds, which should be sown upon a bed of light earth in *March*; and when the plants come up, they should be thinned where are too close; and if the plants are wanted, those which are drawn out may be transplanted into a bed at about three or four inches distance, where they should remain till they are fit to transplant out for good. In *June* they must be transplanted out, on a moist rich spot of ground at about four feet asunder every way; the ground should be well dug before they are planted, and the plants should be well watered until they have taken new root, after which the ground must be kept clean from weeds, to encourage the growth of the plants; and as they advance in height, there should be some earth drawn up about each; and when they are fully grown, their leaves should be closely tied up with a hay band, and the earth drawn up in hills about each plant, almost to their tops, being careful to keep the earth from falling between the leaves, which may occasion the rotting of the plants. This earth should be smoothed over the surface that the wet may run off, and not fall into the center of the plants. In about five or six weeks after the plants have been thus earthed, they will be blanched enough for use; so that if a succession of them are wanted for the table, there should be but few plants earthed up at the same time, but every week or ten days, there may be a part of them earthed, in proportion to the quantity desired.

Toward the middle or latter end of *November*, if the frost should be severe, it will be proper to cover the tops of those plants which remain with Pease haulm, or straw, to prevent the frost from penetrating to the tender leaves, which frequently pinches them where there is not some covering; but this should be taken off again in mild weather; if this care is taken, the plants may be preserved for use all the winter.

The fourth sort grows naturally in *Spain*, and also on the African shore, and is preserved in gardens for the sake of variety; this is very like the third sort, but the stems of the leaves are much smaller, and do not grow more than half so high. The heads of this have some resemblance to those of the French Artichoke, but have no meat, or fleshy substance in their bottoms; this may be planted in the same manner as the third sort, at about three or four feet apart, and will require no other treatment, than the keeping them clean from weeds; the second year they will flower, and, if the season proves dry, they will ripen their seeds.

CYNOGLOSSUM. *Lin. Gen. Pl.* 168. Hounds Tongue.

The Characters are,

It hath a funnel-shaped flower of one leaf, with a long tube. It hath five short stamina, in the chaps of the petal. At the bottom of the tube are situated four germen; the empalement afterwards becomes four capsules, inclosing four oval seeds.

The Species are,

1. CYNOGLOSSUM staminibus corolla brevioribus, foliis lanceolatis tomentosis sessilibus. *Lin. Sp. Plant.* 134. Common Greater Hounds Tongue.

2. CYNOGLOSSUM staminibus corollam aequantibus. *Hort. Upsal.* 33. Greatest Mountain Hounds Tongue.

3. CYNOGLOSSUM foliis oblongis tomentosis, amplexicaulis, caule ramoso, spicis florum longissimis sparsis. Broad-leaved stinking Hounds Tongue of *Crete*.

4. CYNOGLOSSUM

4. *CYNOGLOSSUM corollis calyce duplo longioribus foliis lanceolatis. Prod. Leyd. 406.* Hounds Tongue of Crete, with a narrow silvery leaf.

5. *CYNOGLOSSUM caule ramoso hirsuto, foliis lanceolatis asperis, floribus sparsis.* Virginia Hounds Tongue with a very small white flower.

6. *CYNOGLOSSUM caule erecto ramoso, foliis lanceolatis scabris sessilibus, spicis florum longissimis.* Taller Portugal Navelwort with a Hounds Tongue leaf.

7. *CYNOGLOSSUM foliis lineari-lanceolatis glabris. Hort. Cliff. 47.* Portugal Navelwort with a Flax leaf, commonly called Venus Navelwort.

8. *CYNOGLOSSUM repens, foliis radicalibus cordatis. Hort. Cliff. 47.* Low Spring Navelwort with a Comtry leaf.

The first sort grows naturally by the side of hedges and foot-ways in most parts of England, so is seldom admitted into gardens; the roots of this sort are used in medicine, which are gathered by the herb-folks in the fields. The leaves of this plant have a strong odour, like that of mice in a trap.

The second sort grows naturally on the *Apeunine* mountains; the leaves of this sort are much larger, the petal of the flower is shorter, and the plants grow taller than those of the first, and come earlier to flower in the spring; this is equally hardy with the common sort, and where the seeds are permitted to scatter, there will be plenty of the plants arise without care.

The third sort grows naturally in *Andalusia*; this hath a tall branching stalk, garnished with oblong woolly leaves, which embrace the stalk with their base. The flowers are produced in loose spikes, which come out from the side of the stalk, and are from six to eight inches long, and are thinly placed on one side; they are blue, striped with red. The seeds ripen in autumn, soon after which the root decays.

The fourth sort grows naturally in *Spain*, and also in the island of *Crete*. This rises with an upright stalk, little more than a foot high, garnished with long, narrow, silvery leaves, having no foot-stalks. The flowers are produced from the side, and at the top of the stalks, which are but thinly dispersed on the side, but at the top of the stalk are in small clusters; they are of a deep purple colour, and much longer than the empalement; these are succeeded by four broad buckler-shaped seeds, which are rough.

The fifth sort grows naturally in *Virginia*, and in other northern parts of *America*; this rises with an upright branching stalk, near four feet high. The stalks and leaves are covered with rough hairs; the branches are spread out on every side, and are but thinly garnished with leaves, from three to near four inches in length, and little more than one inch broad in the middle, gradually lessening to both ends; they have very short foot-stalks, and are placed alternate; the flowers grow scatteringly toward the end of the branches; these are small, white, and are succeeded by four small seeds, which ripen in autumn.

The sixth sort grows naturally in *Portugal*, but the seventh sort hath been long cultivated in the gardens for ornament, by the title of *Venus Navelwort*, but of late years that has been lost in *England*; and the sixth sort is now generally sown in the gardens, the seeds of which are sold by the seedsmen under that title; this is a much larger plant than the other, so makes a finer appearance. The leaves of the sixth sort are broad at their base, and are gradually narrowed to the end; they are slightly covered with hairs. The stalks grow nine or ten inches high, and divide into many branches, each being terminated by a long loose spike of white flowers, standing on separate foot-stalks; and are succeeded by four umbilicated seeds, from whence it had the title of *Navelwort*.

The seventh sort seldom rises more than five or six inches high; the stalks do not branch near so much as those of the sixth. The leaves are very narrow and long, of a grayish colour, and smooth. The flowers grow in short loose panicles at the end of the branches; these are white, but smaller than those of the other sort, and are succeeded by seeds of the same form.

These are both annual plants, which have been commonly sown in gardens, with other low annual flowers, to adorn the borders of the flower garden; but these should be sown in autumn, for those which are sown in the spring often fail, especially in dry seasons; and the autumnal plants always grow much larger, than those which arise from the spring sowing, and come to flower earlier in the year. The seeds should be sown where the plants are designed to remain, for they do not bear transplanting, unless it is performed while they are young. The plants require no other culture, but to be thinned where they are too close, and kept clean from weeds.

The eighth sort is a low perennial plant, which grows naturally in the woods of *Spain* and *Portugal*, where it usually flowers about *Christmas*. It hath trailing branches, which put out roots from their joints, whereby it propagates very fast. The leaves are heart-shaped, of a bright green colour, and stand upon long slender foot-stalks. The flowers grow in loose panicles, which arise from the divisions of the stalk; they are shaped like those of *Borage*, but are smaller, and of a lively blue colour; they appear in *March* and *April*, and in a cool shady situation continue great part of *May*, but are rarely succeeded by seeds; but the plants propagate themselves so fast by their trailing branches, as to render the cultivation of them by seeds unnecessary. It delights in a moist cool situation.

CYPRIPEDIUM. Lin. Gen. Pl. 906. Ladies Slipper.

The Characters are,

It hath a simple spadix. The germen sits under the flower, which is covered with a sheath. The flowers have four or five narrow spear-shaped petals, which expand. The nectarium, which is situated between the petals, is swollen and hollow, in shape of a shoe, or slipper. It hath two short stamina. Below the flower is fixed a slender contorted germen, which afterward becomes an oval blunt capsule with three corners, having three valves, and one cell, filled with small seeds.

The Species are,

1. *CYPRIPEDIUM radicibus fibrosis, foliis ovato-lanceolatis caulinis. Aët. Upsal. 1740.* Our Ladies Slipper.

2. *CYPRIPEDIUM scapo unifloro, foliis oblongis glabris, petalis angustis acuminatis.* Yellow Ladies Slipper.

3. *CYPRIPEDIUM foliis oblongo-ovatis venosis hirsutis, flore maximo.* Ladies Slipper with a larger flower.

The first sort grows naturally in some shady woods in the north of *England*. I found it in the park of *Borough Hall*, in *Lancashire*, the seat of the late *Robert Fenwick, Esq.* It hath a root composed of many fleshy fibres, from which arise two, three, or more stalks, in proportion to the strength of the root; these grow nine or ten inches high, garnished with oval spear-shaped leaves, having a few longitudinal veins; in the bosom of one of the upper leaves, is inclosed the flower-bud, which is supported by a slender foot-stalk, which generally turns a little on one side. The flower hath four dark purple petals, placed in form of a cross, which spread wide open. In the center is situated the large hollow nectarium, almost as large as a bird's egg, shaped like a wooden shoe, of a pale yellowish colour, with a few brown streaks; the opening is covered with two ears; the upper one is tender, white, and spotted with purple; the lower is thick, and of an herbaceous colour.

The second sort grows naturally in *Virginia*, and other parts of *North America*; this hath longer and smoother leaves than

than the former. The two side petals of the flower are long, narrow, and terminate in acute points, and are wreathed, or undulated on their sides. The nectarium is oblong, and narrower than in the first sort, and is yellow, spotted with brownish red. The stalks rise near a foot and an half high.

The third sort grows naturally in *America*, where the inhabitants call it Moccasin flower; this rises a foot and an half high. The leaves are of an oblong oval form, and are deeply veined. The flower is large, of a reddish brown colour, marked with a few purple veins.

All these sorts are with difficulty preserved in gardens; they must be planted in a loamy soil, and in a situation where they may have the morning sun only. They must be procured from the places where they naturally grow, for they cannot be propagated in gardens. The roots should be seldom removed, for transplanting them prevents their flowering.

CYSTICAPNOS. See *Fumaria*.

CYTISO GENISTA. See *Spartium*.

CYTISUS. *Lin. Gen. Pl.* 785. Base Tree Trefoil.

The Characters are,

It hath a butterfly flower. The standard of the flower is rising, oval, and reflexed on the sides. The wings are obtuse, erect, and the length of the standard. The keel is bellied and acute. It hath ten stamina, nine joined, and one standing separate, and an oblong germen, which after-ward becomes an oblong blunt pod, filled with kidney-shaped flat seeds.

The Species are,

1. *CYTISUS foliis oblongo-ovatis, racemis brevioribus pendulis, caule arboreo*. Broad-leaved Cytisus of the Alps, with pendulous bunches of flowers, commonly called Laburnum.

2. *CYTISUS foliis ovato-lanceolatis, racemis longioribus pendulis, caule fruticoso*. Narrow-leaved Cytisus of the Alps, with longer pendulous bunches of flowers, commonly called long-spiked Laburnum.

3. *CYTISUS racemis simplicibus erectis, foliis ovato-oblongis*. *Hort. Cliff.* 354. Blackish smooth Cytisus.

4. *CYTISUS villosus, foliolis cuneiformibus perennantibus, caulibus ramosissimis, racemis terminalibus*. Ever-green hoary Cytisus of the Canary islands.

5. *CYTISUS racemis erectis, calycibus bractea triplici unctis, foliis floralibus sessilibus*. *Lin. Sp. Pl.* 739. Smooth Cytisus with roundish leaves, and very short foot-stalks, commonly called by gardeners, *Cytisus secundus Clusii*.

6. *CYTISUS hirsutus, foliolis ovatis, floribus lateralibus, caule erecto fruticoso*. Hairy Cytisus, commonly called Ever-green Cytisus of Naples.

7. *CYTISUS floribus subsessilibus, foliis tomentosis, caulibus herbaceis*. *Lin. Sp. Pl.* 740. Low silvery Cytisus with narrow leaves.

8. *CYTISUS floribus capitatis, ramis decumbentibus*. *Prod. Leyd.* 376. Low Cytisus, with the under side of the leaves and pods covered with a soft down.

9. *CYTISUS floribus lateralibus, foliis hirsutis, caule erecto striato*. *Sauv. Monsp.* 161. Cytisus of Montpellier with a Medick leaf, and hairy pods collected in thick bunches.

10. *CYTISUS ramis humifusis albidis, floribus capitatis terminalibus, foliolis ovalibus glabris aggestis*. *Sauv. Monsp.* 190. Hoary narrow-leaved Cytisus with complicated leaves.

11. *CYTISUS caule erecto fruticoso, ramis foliolis ovatis glabris, floribus capitatis terminalibus*. Cytisus with a shrubby, erect, branching stalk, oval smooth leaves, and flowers collected in heads terminating the branches; or the Siberian Cytisus.

12. *CYTISUS floribus capitatis, foliolis ovato-oblongis, caule fruticoso*. Cytisus with flowers collected in heads, oblong oval leaves, and a shrubby stalk; commonly called Tartarian Cytisus.

13. *CYTISUS caule erecto fruticoso, foliolis cuneiformibus*

emarginatis, floribus simplicibus alaribus. Cytisus with a shrubby erect stalk, wedge-shaped leaves, which are indented, and single flowers growing on the sides of the branches.

14. *CYTISUS foliis lanceolato-linearibus tomentosis, floribus spicatis alaribus pedunculis longissimis*. Hairy narrow-leaved African Cytisus.

15. *CYTISUS racemis lateralibus strictis, ramis angulatis, foliolis cuneiformibus*. *Lin. Sp. Plant.* 740. Ethiopian Cytisus, with smaller, roundish, hoary leaves, and a small yellow flower.

16. *CYTISUS racemis axillaribus erectis, foliolis sublancoelatis tomentosis, intermedio longius petiolato*. *Flor. Zeyl.* 357. Tree Cytisus with eatable fruit, commonly called Pigeon Pea in *America*.

The first sort is the common broad-leaved Laburnum, which was formerly in greater plenty in the *English* gardens than at present; for since the second sort hath been introduced, it hath almost turned this out; the spikes of flowers being much longer, they make a finer appearance when they are in flower, which has occasioned their being more generally cultivated; but the first grows to be the largest tree, and the wood of it is very hard, of a fine colour, and will polish very well; it approaches near to green Ebony. In *England*, there are few of these trees which have been suffered to stand long enough to arrive to any considerable size; for as they have been only considered as an ornamental tree, so the frequent alterations which most of the gardens in *England* have undergone, have occasioned their being rooted out, where-ever they were growing; but in some of the old gardens in *Scotland*, where they have been permitted to stand, there are large trees of this kind, which are fit to cut down for the use of the timber. They grow very fast, and are extremely hardy, so may be well worth propagating upon poor shallow soils, and in exposed situations. His grace the duke of *Queensberry* sowed a great quantity of the seeds of this tree, upon the side of the downs, at his seat near *Amesbury*, in *Wiltshire*, where the situation was very much exposed, and the soil so shallow, as that few trees would grow there; yet in this place the young trees were twelve feet high in four years growth, so became a shelter to the other plantations, for which purpose they were designed; but the hares and rabbits are great enemies to these trees, by barking them in winter, so that where these trees are cultivated, they should be fenced from these animals.

Both the sorts are easily propagated by seeds, which the trees produce in great plenty; if these are sown upon a common bed of earth in *March*, the plants will appear by the middle, or end of *April*, and will require no other care but to be kept clean from weeds, during the following summer; and if the plants are too close together, they may be transplanted the autumn following, either into a nursery where they may grow a year or two to get strength, or into the places where they are designed to remain; but where people would cultivate them for their wood, it will be the best way to sow the seeds upon the spot where they are intended to grow, because these trees send out long thick fleshy roots to a great distance, which will penetrate gravel or rocks, and if the roots are cut or broken, it greatly retards their growth; therefore when they are not sown upon the intended spot, they should be transplanted thither young, otherwise they will not grow to near the size; though where they are only designed for ornament, the removing the plants twice will stop their growth, and cause them to be more productive of flowers; but all trees intended for timber, are much better sown on the ground, where they are to remain, than if they are transplanted.

If the seeds of these trees are permitted to scatter in winter, the plants will rise in great plenty the following spring, so that a few trees will soon supply any person with a sufficient number of the plants.

If the first sort comes to be considered as a useful wood, which there is no reason to doubt it may be, it may be planted in large clumps in parks, where they will be very ornamental; and I am certain, from long experience, that this tree will thrive upon many soils, and in such situations as few other trees will make any progress; the objection to fencing is the same here, as for any other trees, for wherever plantations are made, if they are not well secured from animals, they will not answer the design of the planters.

The second sort differs from the first, in having narrower leaves, longer bunches of flowers, and the trees do not grow so large and strong; this difference I find is constant from seed. There is another sort mentioned by *Tournefort*, with shorter bunches of flowers than either of these, one tree of which kind I thought I had found in a garden; the bunches of the flowers upon this tree were close and almost round, but I sowed the seeds of it, and the plants proved to be only the common sort.

The third sort grows naturally in *Austria*, *Italy*, and *Spain*, and at present is pretty rare in the *English* gardens; it was formerly in some of the curious gardens here, but had been long lost, till a few years ago, when I procured the seeds from abroad.

This shrub seldom rises more than three or four feet high in *England*; it naturally puts out many lateral branches near the ground, which spread out on every side, so as to form a low shrubby bush, and is with difficulty raised to a stem: the branches are very slender, and their ends are frequently killed if the winter is severe; these are garnished with oblong oval leaves, growing by threes on each foot-stalk; they are equal in size, and of a dark green colour; the branches grow erect, and are terminated by spikes of yellow flowers, about four or five inches long, standing upright; and as all the branches are thus terminated, so when the shrubs are in flower, they make a fine appearance; it flowers in *July*, after most of the other sorts are past. This is propagated by seeds, which should be sown on a bed of light earth in *March*. In the beginning of *May* the plants will appear, when they must be carefully weeded. In autumn the bed should be arched over with hoops, that in frosty weather the plants may be covered with mats, to prevent their tender shoots from being killed; for as these young plants are apt to continue growing later in the autumn, than those which are become woody, so they are much more susceptible of cold; therefore where there is not some care taken to cover them, if the winter should prove severe, many of them may be entirely destroyed. The spring following, after the danger of hard frost is over, the plants should be carefully taken up, and planted out at the distance of one foot, row from row, and six inches asunder in the rows; this should be in a sheltered situation: as these plants do not shoot till late in the spring, so they need not be transplanted before the beginning of *April*, and if the season should then prove warm and dry, it will be proper to give the plants some water to settle the earth to their roots. After they have taken new root, they will require no farther care, but to keep them constantly clean from weeds: in this nursery the plants may remain two years, by which time they will have acquired strength enough to be transplanted where they are to remain.

The fourth sort grows naturally in the *Canary* islands. This is too tender to live through the winter in the open air here, but requires the shelter of a green-house, and will thrive in such places where *Myrtles* and *Amomum Plinii* do well. It is a very bushy shrub, which rises with rough pliable stalks to the height of eight or ten feet, sending out many slender hairy branches, which are very closely garnished with small wedge-shaped leaves, placed by threes on each foot-stalk: they are of a dark green, and very hairy; the branches are terminated by close bunches of bright yellow flowers, which

are frequently succeeded by short hairy seed pods, which ripen in *August*.

It is propagated by seeds, which should be sown upon a very temperate hot-bed in *March*, which will bring up the plants in a short time; then they may be transplanted, each into a small halfpenny pot, filled with light earth, and plunged into a moderate hot-bed, just to forward their taking fresh root; after which they should be inured gradually to the open air, and the middle or latter end of *May*, they should be placed abroad in a sheltered situation, and afterward treated in the same way, as other hardy kinds of green-house plants.

The fifth sort grows naturally in the south of *France*, in *Spain* and *Italy*, but has been long cultivated in the nursery gardens, as an ornamental flowering shrub, by the title of *Cytisus secundus Clusii*, which is a great mistake, for the tenth species here enumerated is the second of *Clusius*. This rises with a woody stalk, putting out many branches covered with a brownish bark, and garnished by obverse, oval, small leaves, growing by threes on very short foot-stalks. The flowers are produced in close short spikes at the end of the branches; they are of a bright yellow colour, and appear in *June*; these are succeeded by short broad pods, which contain one row of kidney-shaped seeds, which ripen in *August*. These shrubs will rise to the height of seven or eight feet, and become very bushy; they are very hardy, so will thrive in any situation, and upon almost any soil, which is not too wet.

The sixth sort hath a soft shrubby stalk, dividing into many branches, which grow erect, and rise to the height of eight or ten feet; the stalks and leaves of this are very hairy, the leaves are oval, growing three upon each foot-stalk; the flowers come out from the side of the branches, in short bunches; they are of a pale yellow, and are succeeded by long, narrow, hairy pods, with one row of kidney-shaped seeds.

This sort, of late years, has been much cultivated in the nursery gardens near *London*, by the title of ever-green *Cytisus* of *Naples*; but as in severe frost these shrubs are sometimes killed, so they are not proper for every situation, therefore should only be planted on a dry soil, and in warm situations; they are also very difficult to remove, when grown to any size, for they shoot long roots deep into the ground, and when these are cut or broken, the plants seldom survive it. This may be propagated in the same manner as hath been directed for the third sort.

The seventh sort grows naturally in the south of *France*, and in *Italy*. This is a low perennial plant, which puts out several weak stalks from the root, which spread on the ground, and are from six to eight inches long, garnished with small silvery leaves growing by threes; the flowers are produced at the end of the branches, two or three growing together upon short foot-stalks; they are of a pale yellow colour; but unless the season proves very warm, they do not produce seeds in *England*. It is propagated by seeds, which should be sown in the spring, in a warm border, where the plants are to remain; for as they have commonly one downright root, so they seldom live if they are transplanted. The plants require no other culture, but to keep them clean from weeds, and the second year they will flower.

The eighth sort grows naturally in *Sicily*, *Italy*, and *Spain*; this is a perennial plant, from whose downright root, proceed several weak branches, which trail upon the ground, and extend to the length of eight or ten inches; garnished with oblong leaves, placed by threes upon pretty long foot-stalks; they are hoary on their under side; but smooth above; the flowers are collected in heads at the ends of the stalks, having a cluster of leaves under them; they are of a deep yellow colour, and in warm seasons they

they are succeeded by flat woolly pods, containing one row of small kidney-shaped seeds. This plant is propagated by seeds, which should be sown where they are to remain, and treated in the same manner as the seventh sort.

The ninth sort grows naturally about *Montpelier*; this rises with an upright stalk four or five feet high, sending out many side branches, which are streaked or furrowed, and garnished with oval hairy leaves; the flowers are produced in short spikes on the side of the branches, which are of a bright yellow, and are succeeded by hairy pods, which ripen in autumn. This may be propagated in the same manner as the third sort.

The tenth sort grows naturally about *Montpelier*; this is a perennial plant, with a strong downright root, sending out many tough ligneous branches, which spread flat on the ground, and extend to a foot and an half in length, covered with a white bark, and garnished with very small Trefoil leaves; the flowers are produced at the extremity of the branches in clusters; they are but small, and of a deep yellow inclining to an Orange colour, and in very warm seasons are succeeded by short pods, containing three or four kidney-shaped seeds in each. This sort is propagated in the same manner as the seventh.

The eleventh sort came from *Siberia*; this is a low shrub, which seldom rises more than three feet high in *England*, sending out side branches, garnished by oval smooth leaves, having pretty long foot-stalks; the flowers are produced in clusters or heads at the end of the branches; they are of a bright yellow, and appear the end of *March*, or the beginning of *April*, but are seldom succeeded by pods in *England*. This is propagated by seeds as the other sorts, but requires a cool situation; for the plants are subject to shoot upon the first mild weather in *February*, and so are often cut down by the frosts in *March*, which sometimes kills the shoots down to the old wood.

The twelfth sort grows naturally in *Tartary*. This hath a weak shrubby stalk, which rises near four feet high, covered with a green bark, and closely garnished by oblong oval leaves, which are hoary; the flowers are produced in close heads at the end of the branches, having a cluster of leaves under them; they are of a bright yellow colour, and are sometimes succeeded by short woolly pods, containing three or four small kidney-shaped seeds in each. This is propagated by seeds, which should be sown early in the spring, on a border of strong ground exposed to the east; for if they are sown where they have full sun, the plants will not thrive. It requires a cold situation and a pretty strong soil, otherwise it will not thrive.

The thirteenth sort grows naturally about *Algiers*. This rises with a soft shrubby stalk to the height of eight or ten feet, with many slender branches, garnished with small

wedge-shaped leaves, indented at the top, and of a dark green colour; the flowers come out single from the side of the branches, they are large and of a bright yellow colour, and are sometimes succeeded by pods containing three or four kidney-shaped seeds, which ripen in autumn. This sort is too tender to live in the open air through the winter in *England*, therefore the plants must be treated in the same way as those of the fourth sort; it is propagated by seeds in the same manner.

The fourteenth sort grows naturally in *Africa*; this rises with weak stalks about five feet high, which send out a few side branches, garnished by narrow, spear-shaped, Trefoil, woolly leaves, standing on long foot-stalks; the flowers grow in close spikes, upon long naked foot-stalks, which arise from the wings of the leaves; they are small, of a deep yellow colour, but do not produce seeds here. This requires the same treatment as the former sort.

The fifteenth sort grows naturally at the *Cape of Good Hope*; this hath a weak shrubby stalk near six feet high, sending out weak angular branches, like those of the common Broom, garnished by wedge-shaped small leaves growing by threes. The flowers come out in small slender bunches from the side of the stalks; they are small and of a pale yellow colour, but are rarely succeeded by seeds here. This must be propagated and treated in the same manner as the fourth sort.

The sixteenth sort grows naturally in the islands of *America*; it rises with a shrubby stalk eight or ten feet high, garnished by spear-shaped woolly leaves, placed by threes on each pedicle; that in the middle having a distinct foot-stalk, the two side lobes growing close to the principal foot-stalk. The flowers come out from the side of the branches, sometimes single, at other times in clusters; they are of a deep yellow colour, and about the size of those of the common Laburnum, and are succeeded by hairy pods about three inches long, which are sickle-shaped, ending with a long acute point; the seeds are roundish, a little inclined to a kidney shape, and are esteemed an excellent food for pigeons in *America*, from whence it had the title of Pigeon Pea.

This plant grows only in very warm countries, so cannot be preserved in *England*, unless it is placed in a warm stove. It rises easily from seeds in a hot-bed, and will grow three or four feet high the first year, provided they have a proper heat, and the second year they will produce flowers and seeds. The plants must be placed in the bark bed in the stove, and treated in the same manner as other tender plants from the same countries: they should have but little water in winter, and in the summer should have a large share of free air admitted to them in warm weather.

D.

D A M

D AFFODIL. See Narcissus.

DAISIES. See Bellis.

DALECHAMPIA. Lin. Gen. Plant. 1022.

The Characters are,

It hath male and female flowers on the same plant; the male flowers have no petals, but many stamina. The female flowers have a roundish three-cornered germen, which afterward becomes a round three-cornered capsule, having three cells, each containing one roundish seed.

We have but one Species of this in England, viz.

DALECHAMPIA foliis trilobis glabris, floribus axillaribus caule volubili. Delachampia, with smooth trifoliate leaves, flowers growing from the sides of the branches, and a twining stalk.

This plant grows naturally in Jamaica. From the root composed of many fibres, arise several weak twining stalks, which fasten themselves to the neighbouring plants, and mount up to a considerable height; they are garnished at each joint by one trifoliate leaf, or more properly by a leaf divided into three lobes, for these are joined together at their base, which are smooth; the two side lobes are oblique to the midrib. The flowers are produced from the side of the stalks, three or four growing upon each foot-stalk; some of these are male, and others female; they are of an herbaceous colour, and small, so make no appearance; they have each a double involucre, made up of two orders of leaves, which are narrow, and armed with small bristly hairs, which sting the hands of those who unwarily touch them; the flowers are succeeded by roundish capsules, having three prominent lobes which are smooth, each inclosing a single seed.

This plant is propagated by seeds, which must be sown early in the spring on a hot-bed; and when the plants are three inches high, they should be carefully transplanted, each into a separate small pot, and plunged into a hot-bed of tanners bark, being careful to screen them from the sun, until they have taken new root; after which, they should have a great share of fresh air in warm weather. When the plants have grown so large as to fill these pots with their roots, they should be removed into larger, and placed in the bark bed in the stove; where they must be supported either with stakes, or a trellis, round which they will twine, and rise to the height of eight or ten feet.

The plants must be kept constantly in the stove, for they are too tender to bear the open air in this country, even in the summer season; therefore they should be placed with tender Convolvuluses, and other twining plants, near the back of the stove, where a support should be made for them; in summer they will flower, and in warm seasons will perfect their seeds in this country. These plants do not continue longer than one year, so that young plants should be raised annually to preserve the kind.

DAMASONIUM. Star-headed Water Plantain.

The Characters are,

It hath a flower composed of three petals, included in a three-leaved empalement, with a star-shaped fruit, which is full of oblong seeds.

D A P

The Species are,

1. DAMASONIUM stellatum. Lugd. Star-headed Water Plantain.

2. DAMASONIUM Americanum maximum, plantaginis folio, flore flavescente, fructu globofo. Plum. Greatest American Water Plantain, with a Plantain leaf, a yellowish flower, and a globular fruit.

The first of these plants is a native of England; it grows commonly in standing waters, which are not very deep. It is sometimes used in medicine, but never cultivated in gardens, so must be gathered for use in the places of its growth.

The second sort grows in Jamaica, Barbadoes, and several other places in the warm parts of America, where it is generally found in stagnating waters, and other swampy places; so that it would be difficult to preserve this plant in England, for it will not live in the open air, and requires a bog to make it thrive; but as it is a plant of no great beauty or use, it is not worth the trouble of cultivating in this country.

DANDELION. See Leontodon.

DAPHNE. Lin. Gen. Plant. 436. Spurge Laurel, or Mezereon.

The Characters are,

The flower hath no empalement; it is of one petal, cut into four parts at the top; it hath eight short stamina. The oval germen is situated at the bottom of the tube, which afterward becomes a roundish berry with one cell, inclosing one roundish fleshy seed.

The Species are,

1. DAPHNE racemis axillaribus, foliis lanceolatis glabris. Lin. Sp. Plant. 357. Male Laureola, commonly called Spurge Laurel.

2. DAPHNE floribus sessilibus ternis caulinis, foliis lanceolatis deciduis. Lin. Sp. Plant. 357. Thymelæa, with a deciduous Bay leaf, commonly called Mezereon.

3. DAPHNE floribus sessilibus axillaribus, foliis lanceolatis, caulibus simplicissimis. Lin. Sp. Plant. 356. Thymelæa, with smooth Milkwort leaves.

4. DAPHNE floribus sessilibus aggregatis axillaribus, foliis ovatis utrinque pubescentibus nervosis. Lin. Sp. Pl. 356. Thymelæa, with soft, white, fatty leaves, commonly called Tarton-raire.

5. DAPHNE floribus sessilibus aggregatis lateralibus, foliis lanceolatis obtusiusculis subtus tomentosus. Lin. Sp. Pl. 356. Alpine Chamelæa, with obtuse leaves hoary on their under side.

6. DAPHNE floribus congestis terminalibus sessilibus, foliis lanceolatis nudis. Lin. Sp. Plant. 357. This is the Cneorum. Matth. Hist. 46.

7. DAPHNE paniculâ terminali, foliis lineari lanceolatis acuminatis. Lin. Sp. Pl. 357. Thymelæa, with Flax leaves.

8. DAPHNE floribus terminalibus pedunculatis, foliis sparsis linearibus patentibus mucronatis. Lin. Sp. Plant. 358. Thymelæa, with a woolly head, and many small pointed leaves.

The first sort grows in the woods in many parts of England, and is commonly known by the title of Spurge Laurel; of late years there are poor people, who get the young plants out of the woods, and carry them about London to sell

fell in the spring. This is a low ever-green shrub, which rises with several stalks from the root, to the height of three feet, which are garnished with thick spear-shaped leaves, sitting pretty close to the branches, and are of a lucid green; between these, toward the upper part of the stalks, come out the flowers in small clusters, of a yellowish green colour, and appear soon after *Christmas*, if the season is not very severe; these are succeeded by oval berries, which are green till *June*, when they ripen and turn black, soon after which they fall off. The whole plant is of a hot caustick taste, burning and inflaming the mouth and throat. The leaves continue green all the year, which renders the plants ornamental in winter; and as they will thrive under tall trees, so are very proper to fill up the spaces in plantations.

The second sort grows naturally in *Germany*, and of late there hath been a discovery made of its growing in *England*, in some woods near *Andover*, from whence a great number of plants have been taken. This is a very ornamental shrub in gardens; the flowers come out very early in the spring, before others make their appearance. There are two distinct sorts of this, one with a white flower, which is succeeded by yellow berries, the other with Peach-coloured flowers and red berries. These are by some supposed to be accidental varieties arising from the same seeds, but I have several times raised these plants from seeds, and always found the plants come up the same, as those from which the seeds were taken, so they may be called different species. There is a variety of the Peach-coloured *Mezercon*, with flowers of a much deeper colour than the common, but these I have always found to vary in their colours when raised from seeds.

This shrub grows to the height of five or six feet, with a strong woody stalk, putting out many woody branches, so as to form a regular head; the flowers come out very early in the spring, before the leaves appear, growing in clusters all round the shoots of the former year; there are commonly three flowers produced from each knot or joint, standing on the same short foot-stalk, which have short swelling tubes divided into four parts at the top, which spread open; they have a very fragrant odour, so that where there are plenty of the shrubs growing together, they perfume the air to a considerable distance round them. After the flowers are past, the leaves come out, which are smooth, spear-shaped, and placed without order; they are about two inches long, and three quarters broad in the middle, gradually lessening to both ends; the flowers are succeeded by oval berries, which ripen in *June*; those of the Peach-coloured flowers are red, and those of the white yellow.

This is propagated by seeds, which should be sown on a border exposed to the east, soon after the berries are ripe; for if they are not sown till spring, they often miscarry, or at least remain a year in the ground, before the plants appear; whereas those which are sown in *August*, will many of them grow the following spring. When the plants come up, they will require no other care but to keep them clean from weeds, and may continue in the seed bed two summers, especially if they do not make great progress the first year; then at *Michaelmas*, when the leaves are shedding, they should be carefully taken up so as not to break or tear their roots, and planted into a nursery at about sixteen inches row from row, and eight inches asunder in the row. In this nursery they may remain two years, by which time they will be fit to remove to the places where they are designed to remain for good; the best time to transplant these shrubs is in autumn, for as the plants begin to vegetate very early in the spring, so it is not proper to transplant them at that season. The plants grow best in a light earth which is dry, for in cold wet land they become mossy, and make little progress.

Although the berries of this tree are so very acrid, as to burn the mouth and throat of those who may incautiously

taste them, yet the birds greedily devour them, as soon as they begin to ripen; so that unless the shrubs are covered with nets to preserve the berries, they will all be destroyed before they are fit to gather.

The third sort grows naturally in *Spain*, *Italy*, and the south of *France*, where it rises to the height of three or four feet, with a single stalk covered with a light coloured bark; the flowers come out in clusters on the sides of the stalks, which are of an herbaceous colour, so make but little appearance; they appear early in the spring, and are succeeded by small berries which are yellowish when ripe.

The fourth sort grows naturally in the south of *France*; this is a low shrubby plant, which sends out several weak stalks from the root, about a foot long, which spread about irregularly; they seldom become woody in *England*, but are tough and stringy, covered with a light bark; the leaves are small, of an oval form, and are very soft, white, and shining like fatten; these sit pretty close to the stalks; between these the flowers come out in thick clusters from the side of the stalks, they are white, and are succeeded by roundish berries having one hard seed. This flowers here in *June*, but doth not produce ripe seeds.

The fifth sort grows in the mountains near *Geneva*, and in other parts of *Italy*, where it rises about three feet high; the flowers of this come out in clusters from the side of the branches, early in the spring. The leaves are spear-shaped, ending in blunt points, and are hoary on their under side. The flowers are succeeded by small roundish berries, which turn red when ripe.

The sixth sort grows naturally on the *Alps*, as also upon the mountains of *Verona*. This is a very humble shrub, seldom growing more than one foot high with ligneous stalks, garnished with narrow spear-shaped leaves, which are placed round the stalks without order; the branches are terminated by small clusters of purple flowers which stand erect, having no foot-stalks; the tubes of these flowers are longer and narrower than those of the *Mezereon*, and the mouth is cut into four acute parts which are erect. The flowers emit a pleasant odour; they appear early in the spring, but do not produce seeds here.

The seventh sort grows naturally about *Montpelier*. This hath a shrubby stalk, about two feet high, dividing into many smaller branches, closely garnished with narrow spear-shaped leaves, ending in acute points; the ends of the branches are terminated by panicles of flowers, which are much smaller than those of the *Mezereon*, having swelling tubes, which are contracted at the mouth.

The eighth sort grows naturally at the *Cape of Good Hope*. This shrub rises to the height of five or six feet, dividing into several branches which grow erect, and are covered with white bark, and closely garnished with small narrow leaves, which come out on every side of the branches without order. The tops of the branches are terminated by woolly heads, out of which the flowers come in small clusters; they are white, having oblong tubes, which are divided into four obtuse segments at the mouth, which spread open.

The third, fourth, and seventh sorts are hardy, so will live through the winters in *England* in the open air, provided they are in a dry soil. The fifth and sixth sorts are as hardy as the common *Mezereon*, so are not in danger of being hurt by frost in *England*, but these are very difficult to keep in gardens, because neither of them will bear to be transplanted. I have several times raised the plants from seeds, which have succeeded well in the places where they were sown, but whenever they were removed, they certainly died, though performed at different seasons, and with the greatest care, and the same has happened to every other person who has raised any of these plants; and some of

my correspondents have assured me, they have frequently attempted to remove these plants from their natural places of growth, into their gardens, and have chosen plants of all sizes, from the youngest seedlings to the oldest plants, yet have never succeeded in it. Therefore those who are desirous to have these plants in their gardens, must procure their seeds, which should be immediately sown where they are designed to remain. The third, fourth, and seventh sorts, should be on a warm dry border, where, if there is a foundation of lime rubbish or chalk, under the surface of the ground, the plants will thrive better and continue much longer, than in good ground; all the culture they require, is to keep the place clean from weeds, for the less the ground is stirred near their roots, the better the plants will thrive; for they naturally grow on poor shallow land, and out of crevices of rocks, so the nearer the soil approaches to this, the more likely the plants will be to succeed.

The fifth and sixth sorts may have a cooler situation; if these are sown where they may have only the morning sun, they will thrive better than in a warmer situation, and the ground near the roots of these should not be disturbed; therefore in the choice of the situation, there should be regard had to this, not to sow them near other plants, which may require transplanting, or to have the ground dug or loosened. The seeds of these plants should be put up in wet Moss, if they are to be sent to any considerable distance, and should be sown as soon as they arrive.

The eighth sort grows naturally at the *Cape of Good Hope*, so will not live abroad through the winter in *England*, but requires a good green-house to preserve it. This plant is very difficult to keep or propagate in gardens.

DATISCA. *Lin. Gen. Pl.* 1003. Bastard Hemp.

The Characters are,

They have male and female flowers in different plants; the male flowers have a five-leaved empalement, but no petals, with ten summits. The female flowers have no petals, but empalements like the male, with an oblong perovious germen, and three styles, an oblong triangular capsule, with three valves, filled with small seeds adhering to the three sides of the capsule.

The Species are,

1. **DATISCA caule laevi.** *Lin. Sp. Pl.* 1037. Datisca with a smooth stalk.

2. **DATISCA caule hirsuto.** *Lin. Sp. Plant.* 1037. Datisca with a rough stalk.

The first sort grows naturally in *Crete*. It hath a perennial root, from which arise several herbaceous stalks, five feet high, garnished with winged leaves placed alternately, composed of three pair of lobes terminated by an odd one; they are deeply sawed on their edges, and of a light green colour. The flowers come out in long loose spikes from the side of the stalks at the wings of the leaves, but having no petals, make but a poor appearance. The summits of the male flowers being pretty long, and of a bright yellow colour, are the only visible parts of the flowers to be discerned at any distance.

The flowers on the female plants are succeeded by oblong three-cornered capsules filled with small seeds, which adhere to the three valves.

This sort may be propagated by parting the roots, which should be done in autumn, when the stalks decay (which is the best time to transplant the roots) but they must not be parted too small; they may be planted in any open beds, where they are not under the drip of trees, and will require no other culture, but to keep them clean from weeds.

The second sort grows naturally in *Canada*, and other parts of *North America*. This differs from the former, in having hairy stalks, which grow taller; the leaves are larger, and do not stand so near each other upon the stalks. It is equally hardy with the first sort, and may be propa-

gated in the same manner, but should have a more shady situation and a moister soil.

DATURA. *Lin. Gen. Plant.* 218. Thorn Apple.

The Characters are,

The flower hath one funnel-shaped petal, with a long cylindrical tube, which is pentangular, each angle being pointed; it hath five stamina, and an oval germen, which afterward becomes an oval capsule with four cells, which are filled with kidney shaped seeds adhering to the partition.

The Species are,

1. **DATURA fructu rotundo erecto, pericarpio spinoso.** Thorn Apple with a round prickly fruit, and a single white flower.

2. **DATURA fructu ovali erecto, pericarpio spinoso.** Thorn Apple with an oblong prickly fruit, and a Violet-coloured flower.

3. **DATURA caule tomentoso, calycibus bifidis cylindricis, floribus decangularibus, fructibus rotundis nutantibus.** Thorn Apple with a Henbane leaf, a flower wholly white, and a round hanging fruit set with harmless prickles.

4. **DATURA fructu rotundo nutante, pericarpio spinoso, spinis robustioribus.** Thorn Apple with strong spines.

5. **DATURA fructu oblongo, erecto, pericarpio spinoso, caule altissimo.** Thorn Apple with an oblong prickly fruit, and a white flower, commonly called *American Thorn Apple*.

6. **DATURA fructu rotundo nutante, pericarpio carnosio tuberculoso.** *Egyptian Thorn Apple* with a double flower, white on the inside, and Violet-coloured on the outside.

The sorts here enumerated are undoubtedly distinct species, though some have supposed part of them to be only feminal variations, but these also never vary from one sort to another; all the difference which any of them have ever shewn, has been in the double flowers becoming single; for which reason I have only mentioned one with double flowers, which sometimes changes to single, at other times they are with double and treble tubes, stretched out beyond each other like those Primroses called *Hose in Hose*. There is also a double flower of the third sort, which is much esteemed by the curious, but this frequently degenerates to single, so is not to be mentioned as a distinct species.

The first sort here enumerated, is the most common sort of Thorn Apple, and was probably first introduced from *Italy* or *Spain*, where it naturally grows; but it is now become so common about *London*, and near other great towns in *England*, as to appear like a native plant; for there are few gardens or dunghills without this plant in summer, though it is only near such places, where the plants may have been cultivated in the gardens; for where-ever any of these plants are permitted to feed, they will furnish a supply of the plants for some years to come, as they produce a vast quantity of seeds, some of which will lie years in the ground, and when they are turned up to the air will vegetate.

This sort seldom grows much more than two feet high, dividing into many strong, irregular, hollow branches, garnished with large, smooth, angular leaves, which when handled emit a foetid odour. The flowers come out first from the divisions of the branches, and afterward near their extremities; they have long swelling tubes, which are dilated at the top into large pentagonal brims, each angle ending in a long point or ligula; and are succeeded by large roundish seed vessels, covered with large thorns, and are divided by four furrows, to which adhere the partitions, which separate the four cells, filled with black kidney-shaped seeds. The seeds ripen in autumn, which, if permitted to scatter, will fill the ground about them with plants the following years.

The second sort grows naturally in many parts of *America*, the islands of the *West-Indies*, and also in some of the northern parts of *America*. It rises with a purple strong stalk to the height of five or six feet, dividing into many strong branches, garnished with leaves-shaped somewhat like those of the former

former fort, but larger, and have a greater number of angles and laciniae on their edges; the flowers have longer and narrower tubes, of a purple colour; the fruit is also much longer, and these differences are permanent. This is equally hardy with the former, and if the seeds are permitted to scatter, the plants will become troublesome weeds.

The third fort hath a strong woolly stem, which rises three feet high; the leaves of this fort are woolly and almost entire, having only two or three slight indentures on their edges: the flowers have very long tubes, which spread out very broad at the brim, and is divided into ten obtuse angles; they are of a pure white above, but the tubes have a tincture of green within. They are succeeded by roundish fruit, closely covered with long soft thorns, and are divided into four cells as the other, but the seeds of this are of a light brown colour when ripe.

This plant is not so hardy as the others, so the seeds must be sown upon a gentle hot-bed in the spring, and the plants must be afterward treated in the same manner as the Marvel of Peru, and other of the hardier kinds of annual plants, so may be transplanted into the full ground the latter end of May. They will flower in July, and the seeds will ripen in autumn.

The fourth fort is of humbler growth, seldom rising more than a foot and a half high, spreading out into many branches, garnished with leaves somewhat like those of the first fort, but smaller, and stand upon longer foot-stalks; the flowers are like those of the first fort, but smaller; the fruit is round, and armed with very strong sharp thorns. The seeds of this are black when ripe.

This fort is too tender to be sown in the full ground in England, so the plants should be raised on a hot-bed, and afterward transplanted into borders as the former fort.

The fifth fort grows naturally in North America; this resembles the first fort while young, but afterward greatly differs from it; the stalks of this rise five feet high, are very smooth, of a light lucid green, as are also the leaves; the flowers are longer, and have a greater resemblance to those of the second fort. These differences have always continued for above thirty years, where it has been cultivated in the gardens. It is equally hardy with the first, so will propagate itself in plenty, where it remains to ripen seeds.

The sixth fort grows naturally in Egypt, and also in India; this rises with a fine polished purple stalk, four feet high, dividing into several branches, garnished with large, smooth, sinuated leaves, standing upon pretty long foot-stalks. The flowers are produced at the divisions of the branches, and have large swelling tubes; which expand very broad at the top, where their brims turn backward. The flowers are of a beautiful purple on their outside, and a fatiny white within; some of these are single, others have two or three flowers standing one within another. They have an agreeable odour at first, but if long smelt to, become less agreeable, and are narcotick. If these plants are brought forward upon a hot-bed in the spring, and in June planted out on a warm border of rich earth, they will flower very finely in July and August; but unless they are covered with glasses, the seeds seldom ripen well in England. The fruit of this fort is round, and grows nodding downward; the seed vessel is thick and fleshy, as are also the intermediate partitions which divide the cells. The outside of the fruit is covered with blunt protuberances, and the seeds are of a bright brown colour when ripe.

DAUCUS. Lin. Gen. Pl. 296. The Carrot.

The Characters are,

It hath an umbelliferous flower. The flowers are all hermaphrodite, and have five heart-shaped petals, which turn inward; they have each five hairy stamina. The germen sits under the flower, which afterward becomes a roundish striated fruit, covered with stinging bristly hairs.

The Species are,

1. DAUCUS *seminibus hispidis, radice tenuiore servido*. Common wild Carrot.
2. DAUCUS *seminibus hispidis, radice carnosio esculento*. Manured Carrot, with an Orange-coloured root, commonly called Orange Carrot.
3. DAUCUS *radiis involucris planis, laciniis recurvis*. Prod. Leyd. 97. Shining Maritime Carrot.
4. DAUCUS *seminibus nudis*. Hort. Cliff. 89. Gingidium with an oblong umbel.

The first fort is the common wild Carrot, which grows by the side of fields, and in pasture grounds in many parts of England. The plants of this fort do not differ greatly in appearance from the Garden Carrot, which has led some persons into an opinion of their being the same plant, but those who have attempted to cultivate the wild fort, are fully convinced of their being distinct. The seeds of this fort are used in medicine, and are esteemed good to bring away gravel; it is an excellent diuretic, but instead of these seeds, the shops are usually supplied with old seeds of the Garden Carrot; when they have lost their vegetative quality, the seedsmen then sell them to druggists for medicinal use, when they cannot vend them to gardeners; but certainly all seeds which are too old to grow, can have little medicinal virtue remaining in them.

There are some varieties of the Garden Carrot, differing in the colour of their roots, which variations may be continued, where there is proper care taken not to mix the different forts together, when they are left for seed; but the Orange Carrot is generally esteemed in London, so the yellow, the purple, and the white Carrots are seldom cultivated.

The second fort is commonly cultivated in gardens for the kitchen; and the different varieties of it are, in some places, esteemed, though in London the Orange Carrot is preferred to all the other.

Carrots are propagated at three different seasons, or sometimes oftener, where people are fond of having them young. The first season for sowing the seeds is soon after Christmas, if the weather is open, which should be in warm borders, near walls, pales, or hedges, but not immediately close thereto; but a border of Lettuce, or other young Sallad herbs, of about a foot wide, should be next the wall, &c. for if the Carrots are sown close to the wall, &c. they would draw up weak, without growing to have tolerable roots.

Carrots delight in a deep, warm, light, sandy soil, which should be dug two spades deep, that the roots may the better run down; for if they meet with any obstruction, they are very apt to grow forked, and shoot out lateral roots, but especially where the ground is too much dunged the same year that the seeds are sown, which will also occasion their being worm-eaten; but where there may be a necessity for dunging it the same year as the Carrots are sown, the dung should be well rotted, and thinly spread over the ground; and in the digging of it into the ground, great care should be taken to disperse it through the different parts, and not to bury it in heaps. Where the ground is inclinable to bind, there cannot be too much care taken to break and divide the parts; therefore in digging the land for Carrots, there should never be large spits taken, but they must be very thin, and the clods well broken; which, if not attended to by the master, is seldom properly performed by workmen, who are too apt to hurry over their work, if they are not well observed.

The ground when dug should be laid level and even, otherwise when the seeds are sown and the ground is raked over, part of the seeds will be buried too deep, and others will be in danger of being drawn up into heaps; so the plants will come up in bunches, and other parts of

the ground be naked, which should always be carefully avoided.

As these seeds have a great quantity of small forked hairs upon their borders, by which they closely adhere, so they are difficult to sow even, not to come up in patches; therefore they should be well rubbed with both hands, to separate them before they are sown; a calm day should be chosen to sow them, for if the wind blows, it will be impossible to sow the seeds equal; for as they are very light, they will be blown into heaps. When the seed is sown, the ground should be trodden pretty close, to bury them, then rake the ground level.

When the plants are come up, and have got four leaves, the ground should be hoed with a small hoe about three inches wide, cutting down all young weeds, and separating the plants to three or four inches distance each way, that they may get strength; and in about three weeks or a month after, when the weeds begin to grow again, the ground should be hoed over a second time, when there should be care taken not to leave two Carrots close to each other, and also to separate them to a greater distance, cutting down all weeds, and slightly stirring the surface of the ground in every place, the better to prevent young weeds from springing, as also to facilitate the growth of the Carrots.

In about five or six weeks after, you must hoe them a third time, to clear them from weeds as before; and now the Carrots should be separated to the distance they are to remain, which must be proportioned to the size they are intended to grow: if they are to be drawn while young, four or five inches asunder will be sufficient; but if they are to grow large before they are pulled up, they should be left eight or ten inches distant every way.

The second season for sowing these seeds is in *February*, on warm beds situated near the shelter of a wall, pale, or hedge; but those which are intended for the open large quarters, should not be sown before the beginning of *March*, nor should you sow any later than the end of the same month; for those which are sown in *April* or *May*, will run up to seed before their roots have any bulk, especially if the weather should prove hot and dry.

In *July* you may sow again for an autumnal crop, and at the end of *August* you may sow some to stand through the winter; by which method you will have early Carrots in *March*, before the spring sowing will be fit to draw; but these are seldom so well tasted, and are often very tough and sticky. However, as young Carrots are generally expected early in the spring, so most people sow some at this season; but these should be sown on warm borders and upon dry land, otherwise they are seldom good. Many people mix other sorts of feeds with these, as Leek, Onion, Parsnep, Radish, &c. especially in the kitchen gardens near *London*; but this method is not good, for, if there is a full crop of any one of these plants, there can be no room for anything else amongst them, so that what is got by the one is lost by another.

The covetousness of some gardeners will not permit them to cut out their Carrots to a proper distance when they hoe them, so that by leaving them close, they draw each other up weak; and if part of them are drawn while young, those which are left never recover their strength afterward so perfectly, as to grow near the size of those, which are properly thinned at their first hoeing.

This root has been long cultivated in gardens for the table, but has not till of late years been cultivated in the fields for cattle, nor has it been practised as yet, but in few parts in *England*; it is therefore greatly to be wished, that the culture of this root was extended to every part of *England*, where the soil is proper for the purpose; for there is scarce any root yet known, which more deserves it, being a very hearty good food for most sorts of animals. One acre of

Carrots, if well planted, will fatten a greater number of sheep, or bullocks, than three acres of Turneps, and the flesh of these animals will be firmer and better tasted. Horses are extremely fond of these roots, and for hogs there is not any better food. I have also known these roots cultivated for feeding of deer in parks; which has proved of excellent use in hard winters, when there has been a scarcity of other food; at which time, great numbers of deer have perished in some parks for want; and those which have escaped, have been so much reduced, as not to recover their flesh till very late the following summer; whereas those fed with Carrots have been kept in good condition all the winter, and upon the growth of the Grass in the spring, have been fat early in the season, which is an advantage, especially where the Grass is generally backward in its growth.

There is also an advantage in the cultivation of this root beyond that of the Turnep, because the crop is not so liable to fail; for as the Carrots are sown in the spring, the plants generally come up well; and unless the months of *June* and *July* prove very bad, there is no danger of the crop succeeding, whereas Turneps are frequently destroyed by the flies' at their first coming up; and in dry autumns they are attacked by caterpillars, which in a short time devour whole fields, but Carrots are not liable to such accidents: therefore every farmer who has a stock of cattle or sheep, should always have a supply of these roots, if he has land proper for the purpose, which must be light, and of a proper depth to admit of the roots running down.

In preparing of the land for Carrots in the open field, if it has not been in tillage before, it should be ploughed early in autumn, and then ploughed across again before winter, laying it up in ridges to mellow by the frost; and if the ground is poor, there should be some rotten dung spread over it in winter, which should be ploughed in about the end of *January*; then in *March*, the ground should be ploughed again to receive the seeds; in the doing of which, some farmers have two ploughs, one following the other in the same furrow, so that the ground is loosened a foot and an half deep or more: others have men with spades following the plough in the furrows, turning up a spit of earth from the bottom, which they lay upon the top, levelling it smooth and breaking the clods; the latter method is attended with a little more expence, but is much to be preferred to the first; because in this way the clods are more broken, and the surface of the ground is laid much even.

If the land has been in tillage before, it will require but three ploughings; the first just before winter, when it should be laid in high ridges for the reasons before given; the second cross ploughing should be in *January*, after which, if it is well harrowed to break the clods, it will be of great service; the last time must be in *March* to receive the seeds; this should be performed in the manner before mentioned: after this third ploughing, if there remain great clods of earth unbroken, it will be proper to harrow it well before the seeds are sown. One pound and an half of seed will be sufficient for an acre of land, but as they are apt to adhere together, so it renders them more difficult to sow than most other seeds; therefore some mix a quantity of dry sand with their seeds, rubbing them well together, so as to separate the Carrot seeds from each other, which is a good method. After the seeds are sown, they must be gently harrowed in to bury them; and when the plants come up, they should be hoed in the manner before directed, with this caution, to leave the plants at a greater distance.

But in order to preserve Carrots for use all the winter and spring, they should, about the beginning of *November*, when the green leaves are decayed, be dugged up, and laid in sand in a dry place, where the frost cannot come to them, taking them out from time to time as there is occasion for them.

The third sort grows naturally about *Montpelier*; this hath smoother stalks than the common Carrot, the segments of the leaves are broader, and of a lucid green; the umbels of flowers are larger, and not so regular.

The fourth sort is an annual plant, which grows naturally in *Spain* and *Italy*; it rises with an upright channelled stalk three feet high, garnished with smooth leaves, which are divided into many fine segments like those of Fennel; the stalks branch out upward, and each branch is terminated by a large umbel, composed of many small ones; the involucre is shorter than the umbel, and each of the leaves which compose it is trifid: the foot-stalks which sustain the small umbels (or rays) are long and stiff; these are by the *Spaniards* used for picking their teeth, from whence the plant had the title of *Visnaga*, or Pick-tooth. The seeds of this plant should be sown in autumn, for those which are sown in the spring frequently fail, or at least remain in the ground till the following year before they grow; the plants require no other culture but to keep them clean from weeds, and thin them where they are too close.

DAUCUS CRETICUS. See *Athamanta*.

D'AYENA. *Monier*.

This genus of plants receives its title from *Monseigneur Le Duc D'Ayen*, who is a great lover and promoter of the science of botany, and has a noble garden at *St. Germain's*, which is well stored with rare plants from many different parts of the world.

The Characters are,

The flowers arise from the wings of the stalk; they have a five-leaved empalement, and five heart-shaped petals. It hath five stamens inserted in a short nectarium, and a five-cornered germen, situated at the bottom of the nectarium, which afterward becomes a roundish five-cornered capsule, having five cells, each having one kidney-shaped seed.

We have but one Species of this genus, viz.

D'AYENA *inermis, foliis oblongo-cordatis, marginibus dentatis, floribus axillaribus*. Smooth D'AYENA, with oblong heart-shaped leaves indented on their edges, and flowers growing from the sides of the stalks.

This plant grows naturally in *Peru*; it hath a weak ligneous stalk a foot high, which divides into several slender horizontal branches, garnished with oblong heart-shaped leaves, which are slightly indented on their edges, standing upon pretty long foot-stalks; they are of a lucid green, and end in acute points. At the base of each foot-stalk, from the side of the branches, come out the flowers, two, three, or four, arising from the same point, each standing upon a separate slender foot-stalk, and have much resemblance to malvaceous flowers; they have a five-cornered germen at the bottom of the nectarium, which afterward becomes a roundish five-cornered capsule, having five cells, in each of these is lodged one kidney-shaped seed. The flowers are tubulous, and spread open at the top; they are purple, and continue in succession on the same plants, from *July* to the winter.

It is propagated by seeds, which should be sown upon a moderate hot-bed early in the spring; and when the plants have four leaves, they should be transplanted on a fresh hot-bed to bring them forward; part of them may be planted in small pots, and the others may be planted on the bed: those in the pots should be plunged into a hot-bed of tanners bark, and shaded till they have taken new root, then they must have free air admitted to them every day, in proportion to the warmth of the season. These plants should continue all the summer in the hot-bed, where they must have a good share of air, for those which are exposed to the open air will not thrive; and if they are too much drawn, they do not flower well, nor will they perfect their seeds, unless they are brought forward in the spring, and sheltered in summer.

DAY-LILY. See *Hemerocalis*.

DELPHINIUM. *Lin. Gen. Pl. 602*. Larkspur, or Larkheel.

The Characters are,

The flower is composed of five unequal petals; the upper petal is extended at the hinder part, into a tubular obtuse tail. It has a bifid nectarium situated in the center of the petals, and many small stamens, with three oval germen, which afterward become so many capsules joined together.

The Species are,

1. DELPHINIUM *nectariis monophyllis, caule subdiviso*. *Hort. Cliff. 217*. Corn Larkspur.

2. DELPHINIUM *nectariis monophyllis, caule ramoso, foliis multifidis linearibus*. Garden Larkspur, with a larger, single, blue flower, commonly called branching Larkspur.

3. DELPHINIUM *nectariis monophyllis, caule simplici*. *Hort. Cliff. 213*. Upright or unbranched Larkspur.

4. DELPHINIUM *nectariis diphyllis, capsulis solitariis, foliis multipartitis obtusis*. *Hort. Cliff. 213*. Broad-leaved Larkspur with a small flower.

5. DELPHINIUM *nectariis diphyllis, labellis bifidis, apice barbatis, foliis incis, caule erecto*. *Hort. Upsal. 151*. Perennial, hairy, Mountain Larkspur, with a Monkhood leaf, commonly called Bee Larkspur.

6. DELPHINIUM *nectariis diphyllis, labellis integris, floribus subsolitariis, foliis compositis linearimultipartitis*. *Hort. Upsal. 150*. Dwarf, narrow-leaved, perennial Larkspur, with an azure flower.

7. DELPHINIUM *nectariis diphyllis, labellis integris, floribus spicatis, foliis palmatis multifidis glabris*. *Siberian Larkspur*.

8. DELPHINIUM *villosum, nectariis diphyllis, labellis bifidis, foliis palmatis multifidis*. *American perennial Larkspur*.

9. DELPHINIUM *caule erecto simplici, foliis quinquelobatis, incis, glabris*. Smooth *Portugal Larkspur*, with a Monkhood leaf.

10. DELPHINIUM *nectariis diphyllis, foliis palmatis, lobis integris*. *Hort. Cliff. 213*. Larkspur with a Plane tree leaf, called Staveacre.

The several varieties of the Garden Larkspur are not here enumerated, but as the gardeners distinguish the Garden Larkspurs into those which are branched, and such as have upright stalks; which difference is permanent, so I shall just mention the varieties of both sorts. And first of the branched Larkspur, there are of the following colours, with single and double flowers.

Blue, purple, white, flesh, Ash, and Rose colours; and some have flowers beautifully variegated, with two or three of these different colours.

The upright or unbranched Larkspur, produces a greater variety of colours than the branched, and the flowers are larger and fuller than those; but the principal colours run nearly the same with those of the other, though many of the colours are deeper, and there are more different shades of these colours in the flowers of this sort.

The first sort grows naturally amongst the Wheat in *Cambridgeshire*, and some other parts of *England*, where the flowers are of two colours, viz. blue and white.

The branching Larkspur, which is the second sort, comes later to flower than the upright, and has a very branching stalk; the branches come out horizontally from the side of the stalks, but afterward turn that part on which the spike of flowers grow upward, so as to make an angle; the leaves are long and finely divided, the flowers are placed thinner in the spikes than those of the upright sort; they are large, and some of them very double and of various colours.

The third sort hath upright stalks, which scarce put out any branches; the spikes of flowers grow erect, and the flowers are placed very close together, so that they make a fine appearance. These plants flower in *July* and *August*, and

and are very great ornaments to the borders of the flower-garden.

The plants are annual, so are every year propagated by seeds, which should be sown in the autumn in the places where the plants are designed to remain; but to continue a succession of these flowers, there should be some seeds sown in the spring. Where the seeds are sown on the borders of the flower-garden for ornament, it should be in small patches in the middle of the borders, at proper distances; in each of these patches may be scattered a few seeds, covering them over about a quarter of an inch with earth; in the spring, the plants may be thinned, leaving three or four of the upright sort in each patch to stand for flowering; but of the branching sort, not more than two, because these require room; after this the plants will require no farther care but to keep them clean from weeds, and when they begin to flower should be supported, to prevent their being broken by wind, especially if they are not in a sheltered situation. If the seeds are well chosen, there will be very few ordinary flowers among them; and if there are seeds of the different coloured flowers sown in each patch, they will make a pleasing variety: but the upright sort should never be mixed in the same patches with the branching, because they do not flower at the same time.

In order to preserve the two sorts fine without degenerating to single or bad colours, there should be a bed of each sort sown in autumn, in some separate part of the garden, where the plants should be properly thinned, and kept clean from weeds, till they begin to shew their flowers, when they should be carefully looked over every other day, to pull out all those plants, whose flowers are not very double or of good colours; for if these are permitted to stand among the others till their farina has impregnated them, it will certainly cause them to degenerate; so that those persons who are contented with only marking their good flowers for seed, and suffer the others to stand for seed among them, will always find themselves disappointed: therefore those who propose to have their flowers in perfection, should never gather the seeds of such as grew in the borders of the flower-garden; because there it will be almost impossible to preserve them so true, as when they are in beds at a distance from all other kinds.

When the seed vessels turn brown, they must be carefully watched, to gather them before they open and discharge the seeds; so that those which are situated on the lower part of the stalk, will open long before those on the upper part are ripe, for which reason the pods should from time to time be gathered as they ripen.

The fourth sort grows naturally in *Sicily* and *Spain*. This hath a very branching stalk, which rises about two feet high; the lower leaves are divided into many broad obtuse segments, but those which are upon the stalks are generally single; the flowers grow scatteringly toward the upper part of the branches, they are small and of a deep blue colour; these are succeeded by very small seed vessels, which are sometimes single, and at others double, and very rarely three together, as in the common sorts. This is an annual plant, whose seeds should be sown in autumn, and the plants treated as the common sort; it hath little beauty, and is only kept in some gardens for the sake of variety.

The fifth sort hath a perennial root, which sends out several upright stalks in the spring, rising five or six feet high, garnished with leaves which are divided into many broad segments, in form of a spreading hand; these segments are cut at their extremities into several acute points; they are hairy, and stand upon long foot-stalks; the flowers terminate the stalks, growing in long spikes; they are of a light blue, covered toward their hinder part with a mealy down.

The sixth sort grows naturally in *Siberia*. This hath a perennial root, which puts out two or three branching stalks, which rise a foot and an half high, garnished at each joint with leaves composed of many narrow segments, which terminate with several acute points; they are smooth, and of a light green colour; the flowers come out toward the upper part of the stalks singly, each standing upon a long naked foot-stalk; they are large, and of a fine azure colour.

The seventh sort grows naturally in *Siberia*. This is a perennial plant, which rises with many strong branching stalks, seven or eight feet high; the upper part of the stalks are of a fine purple colour, and are garnished with hand-shaped leaves, which are divided into four or five broad lobes, ending with many acute points; they are smooth, and stand upon long foot-stalks; the flowers terminate the stalks, growing in long spikes; they are of a fine blue colour, with a large bearded nectarium, having two lips; of a dark colour, resembling at a small distance the body of a bee, from whence some have titled this and also the fifth sort, Bee Larkspur.

The eighth sort grows naturally in *North America*. This is a perennial plant, which resembles the seventh, but the segments of the leaves are broader, the flowers are much smaller, and of a paler blue, and grow in longer spikes; the leaves of this are woolly, and the stalks seldom grow so tall; these differences are constant in the plants raised from seed.

The ninth sort grows naturally in *Portugal*. This rises with an upright unbranched stalk, about three feet high, garnished with smooth leaves divided into five obtuse lobes, which are cut on their edges into obtuse segments. The flowers are produced in short spikes at the extremity of the stalk; they are of a fine bright blue colour, and do not expand so broad as those of the former sorts.

All these perennial Larkspurs are propagated by seeds, which, if sown in autumn, will more certainly succeed, than those which are sown in the spring; when the plants come up, they should be kept clean from weeds, and where they are too close together, part of them should be drawn out, to allow room for others to grow till the following autumn, when they must be planted where they are to remain; the following summer they will flower, and the roots will continue many years growing in magnitude, so will produce a greater number of flower-stalks.

The tenth sort is an annual plant, which grows naturally in the *Levant*, as also in *Calabria*; this rises with a strong hairy stalk three feet high, garnished with hand-shaped hairy leaves, composed of five or seven oblong lobes, which have frequently one or two acute indentures on their sides; the flowers form a loose spike at the upper part of the stalk, each standing on a long foot-stalk; they are of a pale blue or purple colour, and have a two-leaved nectarium. This is propagated by seeds, which should be sown in autumn, for those sown in the spring never grow the same year. The seeds should be sown where the plants are to remain, and require no other treatment than the common Larkspur.

DENS CANIS. See *Erythronium*.

DENS LEONIS. See *Leontodon*.

DENTARIA. *Lin. Gen. Pl.* 726. Toothwort.

The Characters are,

The flower hath four obtuse petals placed in form of a cross, and six stamina, four of which are as long as the empalement, the other two are shorter. In the center is situated an oblong germen, which after-ward becomes a long taper pod with two cells, divided by an intermediate partition, opening with two valves, including many roundish seeds.

The Species are,

1. DENTARIA *foliis quinatis, foliolis acuminatis serratis*. Five-leaved Toothwort with sawed leaves.
2. DENTARIA *foliis inferioribus pinnatis, summis simplicibus*. Hort. Cliff. 335. Seven-leaved bulb-bearing Toothwort.
3. DENTARIA *foliis ternis ternatis*. Lin. Sp. Plant. 653. Three-leaved Toothwort.
4. DENTARIA *foliis summis digitatis*. Lin. Sp. Plant. 654. Five-leaved Toothwort with rough leaves.

The first sort rises with a strong stalk a foot and an half high, garnished with a leaf at each joint, composed of five lobes, which are four inches long, and near two broad, deeply sawed on their edges; they are smooth, and stand on long foot-stalks; the flowers grow in loose spikes at the top of the stalks; they are small, of a bluish colour, and are succeeded by long taper pods filled with small roundish seeds. It grows in the shady woods in the south of France and Italy.

The second sort rises with slender stalks about a foot high; the leaves at the bottom have seven lobes, those a little above five, others but three, and at the upper part of the stalk they are single: the flowers grow in clusters at the top of the stalk; these have four obtuse purple petals, and are succeeded by taper pods filled with roundish seeds.

The third sort rises with an upright stalk a foot high; the leaves are composed of nine lobes, three growing together, so that one leaf has three times three; the flowers grow in small bunches on the top of the stalks, and are succeeded by small taper pods filled with roundish seeds.

The fourth sort rises a foot and an half high; the lower leaves of this are composed of seven lobes, and those on the upper part of the stalk have five, they are rough and hairy: the flowers grow in loose spikes on the top of the stalks; they are white, and are succeeded by taper pods like the other sorts.

These plants grow on the mountains in Italy, and in the woods of Austria. The second sort is found wild in some parts of England, but particularly near Harefield, in Hertfordshire. This produces bulbs on the side of the stalks, where the leaves are set on, which, if planted, will grow and produce plants. The plants are propagated by seeds, or parting their roots; the seeds should be sown soon after they are ripe, in a light soil and a shady situation: in the spring the plants may be taken up where they grow too close, and transplanted out in the like soil and situation; where, after they have taken root, they will require no farther care, but to keep them clear from weeds: the second year they will produce flowers, and sometimes perfect their seeds.

The best time to transplant the roots is in October, when they should be planted in a moist soil and a shady situation; for they will not live in a dry soil, or when they are exposed to the sun.

DIANTHERA. Lin. Gen. Plant. 37.

The Characters are,

The flower is of the grinning kind, with a short tube; it hath two stamina, one of which hath a twin summit, the other is a little taller, and an oblong germen. The empalement afterward becomes a capsule with two cells, which open with an elasticity, casting a single flat seed out of each cell.

The Species are,

1. DIANTHERA *spicis solitariis*. Lin. Syst. Dianthera with a single spike.
2. DIANTHERA *spicis filiformibus venticillatis, inferioribus umbellatis*. Lin. Syst. Dianthera with whorled spikes, and umbels below.

The first sort grows naturally in Virginia, and other parts of North America. This is a low herbaceous plant with a

perennial root, which sends out upright stalks a foot high, garnished with long narrow leaves of an aromattick odour, standing close to the stalks; from the side of the stalks the foot-stalks of the flowers are produced, sustaining small spikes of flowers.

This plant is very difficult to preserve in this country, for although it is hardy enough to live in the open air in England, yet it is very subject to rot in winter; and if it is placed under shelter, it is apt to draw up weak, and soon after decay, so that at present the plants are rare in this country.

The second sort grows naturally in Jamaica; it has hairy stalks near a foot high, garnished with narrow leaves placed opposite. The flowers are produced in slender spikes, which on the lower part of the stalk is placed in whorls, but at the top they come out without order; the flowers are of a pale purple colour, and being small make no appearance.

It may be propagated by seeds, which must be sown upon a hot-bed, and when the plants are fit to remove, they must be planted in pots, and plunged into a fresh hot-bed; they must be kept in the stove, and treated like other tender plants from the same country.

DIANTHUS. Lin. Gen. Plant. 500. Clove Gillyflower, Carnation and Pink.

The Characters are,

The flower hath a cylindrical empalement of one leaf, scaly below, with five petals, whose tails are as long as the empalement, but their upper part is broad, plain, and spread open. It hath ten stamina. In the center is situated an oval germen, which afterward becomes a cylindrical capsule with one cell, opening in four parts at the top, filled with compressed angular seeds.

The Species are,

1. DIANTHUS *floribus solitariis, squamis calycinis lanceolatis binis, corollis crenatis*. Hort. Cliff. 164. Common narrow-leaved wild Pink.
2. DIANTHUS *caule subunifloro, corollis crenatis, squamis calycinis brevissimis, foliis subulatis*. Lin. Sp. Pl. 412. English small creeping or maiden Pink, commonly called the Matted Pink by seedsmen.
3. DIANTHUS *floribus subsolitariis, squamis calycinis lanceolatis quaternis, corollis crenatis*. Hort. Cliff. 164. Branching Pink, with a white flower having a purple circle, commonly called Mountain Pink.
4. DIANTHUS *floribus solitariis, squamis calycinis subovatis brevissimis, corollis multifidis fauce pubescentibus*. Lin. Sp. Plant. 411. Single wild Pink, with a small, pale, reddish flower.
5. DIANTHUS *floribus solitariis squamis calycinis subovatis brevissimis, corollis crenatis*. Hort. Cliff. 164. Single Garden Carnation with a large flower.
6. DIANTHUS *floribus aggregatis fasciculatis, squamis calycinis lanceolatis villosis tubum æquantibus*. Hort. Cliff. 165. Bearded wild Pink, called Deptford Pink.
7. DIANTHUS *floribus aggregatis fasciculatis, squamis calycinis linearibus, foliis lanceolatis*. Broad-leaved Garden Sweet William.
8. DIANTHUS *floribus aggregatis capitatis, squamis calycinis ovatis obtusis muticis tubum superantibus*. Lin. Sp. Pl. 410. Wild childing Sweet William.
9. DIANTHUS *floribus aggregatis capitatis, squamis calycinis lanceolatis aristatis, corollis crenatis*. Italian umbellated Mountain Pink, with flowers varying from yellow to an iron colour in the same cluster.
10. DIANTHUS *floribus solitariis, squamis calycinis subulatis patulis, tubum æquantibus, corollis crenatis*. Hort. Cliff. 164. The China Pink.
11. DIANTHUS *caulibus unifloris squamis calycinis ovatis, corollis multifidis, foliis linearibus*. Flor. Suec. 318. Dwarf wild Pink with one flower.

12. *DIANTHUS caule unifloro, corollis crenatis, squamis calycinis exterioribus tubum æquantibus, foliis linearibus obtusis.*
Lin. Sp. Pl. 412. Dwarf broad-leaved Pink.

The first sort hath a short ligneous stalk, from which come out several tufted heads closely garnished with long narrow leaves, whose base lie over each other embracing the stalks; between these arise the flower-stalks, which grow about nine inches high, garnished at every joint by narrow grassy leaves placed opposite. The stalks are terminated by a single flower of a pale red colour. This is rarely admitted into gardens, the flower having little beauty.

The second sort is a low trailing plant, whose stalks lie on the ground; they grow very close together, and are garnished with short, narrow, grassy leaves of a deep green colour; the stalks are terminated by small red flowers, each standing upon a separate foot-stalk. This sort grows naturally in several parts of *England*, so is not now often cultivated in gardens, but formerly the seeds were sown to make edgings for the borders of the flower-garden by the title of Matted Pink, by which the seeds were sold in the shops.

The third sort grows naturally upon *Chidder* rocks in *Somersetshire*, and some other parts of *England*; this was formerly cultivated in the gardens, by the title of Mountain Pink. It hath a resemblance of the second sort, but the leaves are shorter, of a grayish colour; the stalks grow taller and branch more; the flowers are larger, of a white colour with a purple circle at the bottom, like that sort of Pink called Pheasant's Eye. As the flowers of this sort have no scent, the plants are seldom kept in gardens.

The fourth sort grows naturally in several parts of *England*, frequently upon old walls; it is a small single Pink of a pale red colour, so is not cultivated in gardens.

The fifth sort is a small single Carnation, which has been long cast out of all the gardens; from some one of this sort, it is supposed the fine flowers now cultivated in the gardens had their original.

The sixth sort grows naturally in several parts of *England*, and particularly in a meadow near *Deptford* in *Kent*, from whence it had the title of *Deptford* Pink. This is of the kind called Sweet William; the flowers of these grow in close clusters at the end of the branches; they are red, and have long bearded empalements. I have never observed this to vary.

The seventh sort is the common Sweet William, which has been long cultivated in the gardens for ornament, of which there are now great varieties which differ in the form and colour of their flowers, as also in the size and shape of their leaves; those which have narrow leaves were formerly titled Sweet Johns by the gardeners, and those with broad leaves were called Sweet Williams; there are some of both these sorts with double flowers, which are very ornamental plants in gardens.

The eighth sort grows naturally in the south of *France*, in *Spain* and *Italy*; this is an annual plant, which rises with an upright stalk about a foot high, garnished with narrow grassy leaves, and is terminated by a small head of pale red flowers, which are included in one common scaly empalement. These have little beauty, so the plants are seldom kept in gardens.

The ninth sort is a perennial plant, which rises with an upright stalk a foot and an half high, having long narrow leaves placed opposite at each joint, which embrace the stalk with their base; they are of a deep green colour, stiff, and end in acute points. The flowers grow in close clusters at the top of the stalks, having stiff bearded empalements; they are yellow and iron-coloured, intermixed on the same stalk, and frequently there are of both colours in the same

head. The roots will continue several years, and annually flower and seed; but the young plants of the second year, always produce the strongest flowers.

The tenth sort came originally from *China*, so it is titled the *China* Pink; the flowers of this have no scent, but there are a great variety of lively colours among them, and of late years there has been great improvements made in the double flowers of this sort, some of which are as full of petals as the double Pink, and their colours are very rich. The plants seldom grow more than eight or nine inches high, branching out on every side; the branches grow erect, and are terminated each by a single flower. They are commonly raised every year from seeds, but the roots will continue two years in dry ground.

The eleventh sort is found growing naturally upon old walls and buildings in many parts of *England*; this is a single small Pink of a sweet odour, but of a pale colour, so makes no appearance; and since the great improvement which has been made in these flowers by culture, this hath been entirely neglected.

The twelfth sort grows naturally on the *Alps*; this hath broad, short, blunt leaves; the stalks seldom rise more than four inches high, each being terminated by a single flower of a pale red colour. It is sometimes preserved in botanick gardens for the sake of variety, but is rarely admitted into other gardens.

The sorts here enumerated, are such as the botanists allow to be distinct species; and all the varieties of fine flowers, which are now cultivated in the gardens of the curious, are supposed to be only accidental variations which have been produced by culture; the number of these are greatly increased annually, in many different parts of *Europe*; so that as new varieties are obtained, the old flowers are rejected.

The plants of this genus may be properly enough divided into three sections. The first to include all the variety of Pinks, the second all the Carnations, and the third those of the Sweet William; for although these agree so nearly in their principal characters, as to be included under the same genus by the botanists, yet they never vary from one to the other, though they frequently change and vary in the colour of their flowers.

I shall proceed therefore to treat of these under their different sections: and first I shall begin with the Pink, of which there are a great variety now cultivated in the gardens; the principal of which are, the damask Pink, the white Shock, the Pheasant Eye with double and single flowers, varying greatly in their size and colour, the Cob Pink, Dobson's Pink, and Bat's Pink. The old Man's Head, and Painted Lady Pink, rather belong to the Carnation.

The damask Pink is the first which flowers of the double sorts; this hath a short stalk, the flower is not very large, and not so double as many others; the colour is of a pale purple inclining to red, but is very sweet.

The next which flowers is the white Shock, which was so called from the whiteness of its flowers, and the borders of the petals being much jagged and fringed; the scent of this is not so agreeable as that of some others.

Then comes all the different kinds of Pheasants Eye, of which there are frequently new varieties raised, which are either titled from the persons who raised them, or the places where they were raised; some of these have very large double flowers, but those which burst their pods, are not so generally esteemed.

The Cob Pink comes after these to flower; the stalks of this are much taller than those of any of the former; the flowers are very double, and of a bright red colour; these have the most agreeable odour of all the sorts, so merit a place

place in every good garden. The time of the Pinks flowering is from the latter end of *May* to the middle of *July*, and frequently that sort of Pheasant Eye, which is called Bat's Pink, will flower again in autumn.

The old Man's Head Pink, and the Painted Lady, do not flower till *July*, coming at the same season with the Carnation, to which they are more allied than the Pink. The first when it is in its proper colours, is purple and white, striped and spotted, but this frequently is of one plain colour, which is purple; this sort will continue flowering till the frost in autumn puts a stop to it, and the flowers having an agreeable scent renders them valuable. The Painted Lady is chiefly admired for the liveliness of its colour, for it is not so sweet, or of so long continuance as the other.

The common Pinks are propagated either by seeds, which is the way to obtain new varieties, or by making layers of them as is practised for Carnations, or by planting slips, which, if carefully managed, will take root very well.

If they are propagated by seeds, there should be care taken in the choice of them, and only the seeds of the best sorts saved, where persons are curious to have the finest flowers. These seeds may be sown in the spring, and the plants afterward treated in the same manner as is hereafter directed for the Carnation: with this difference only, that as the Pinks are less tender, so they may be more hardily treated. Those which are propagated by layers, must be also managed as the Carnation, for which there are full instructions hereafter given. The old Man's Head and Painted Lady Pinks are commonly propagated this way, but most of the other sorts are propagated from slips.

The best time to plant the slips of Pinks is about the end of *July*, when, if there should happen rain, it will be of great service to them; but if the weather be dry, they will require to be constantly watered every other day, until they have taken root; these should be planted in a shady border, and the ground should be dug well, and all the clods broken, and if no rain falls, it should be well soaked with water a few hours before the slips are planted; then the slips should be taken from the plants, and all their lower leaves stripped off, and planted as soon as possible after, for if they are suffered to lie long after they are taken from the plants, they will wither and spoil; these need not be planted at a greater distance than three inches square, and the ground must be closed very hard about them; then they must be well watered, and this must be repeated, as often as it is found necessary, till the cuttings have taken root; after which they will require no other care but to keep them clean from weeds till autumn, when they should be transplanted to the borders of the flower-garden where they are to remain: there are some who plant the slips of Pinks later in the season than is here directed, but these plants are never so strong nor flower so well, as those which are early planted.

We shall next proceed to the culture of the Carnation; these the florists distinguish into four classes.

The first they call Flakes; these are of two colours only, and their stripes are large, going quite through the petals.

The second are called Bizarrs; these have flowers marked or variegated with three or four different colours, in irregular spots and stripes.

The third are called Piquettes; the flowers of these have always a white ground, and are spotted (or pounced, as they call it) with scarlet, red, purple, or other colours.

The fourth are called Painted Ladies; these have their petals of a red or purple colour on their upper side, and are white underneath.

Of each of these classes there are numerous varieties, but particularly of the Piquettes, which some years ago were chiefly

in esteem with the florists, but of late years the Flakes have been in greater request than any of the other kinds. To enumerate the varieties of the principal flowers in any one of these classes, would be needless, since every country produces new flowers almost every year; so that those flowers, which, at their first raising, were greatly valued, are in two or three years become so common, as to be of little worth, especially if they are defective in any one property. Therefore (where flowers are so liable to mutability, either from the fancy of the owner, or that better kinds are yearly produced from seeds, which, with good florists, always take place of older, which are turned out of the garden to make room for them) it would be but superfluous in this place to give a list of their names, which are generally borrowed either from the names and titles of noblemen, or from the person's names, or places of abode, who raised them.

These flowers are propagated either from seeds (by which new flowers are obtained), or by layers, for the increase of those sorts which are worthy maintaining; but I shall first lay down the method of propagating them from seed, which is thus:

Having obtained some good seeds, either of your own sowing, or from a friend that you can confide in, about the middle of *April*, prepare some pots or boxes (according to the quantity of seed you have to sow); these should be filled with fresh light earth mixed with rotten neats dung, which should be well incorporated together; then sow your seeds thereon (but not too thick), covering it about a quarter of an inch with the same light earth, placing the pots, or cases, so as to receive the morning sun only, till eleven of the clock, observing also to refresh the earth with water as often as it may require; in a month or five weeks the plants will come up, and if kept clear from weeds, and duly watered, will be fit to transplant about the latter end of *June*; at which time should be prepared some beds (of the same sort of earth as was directed to sow them in) in an open airy situation, in which they should be planted at the distance of three inches square, observing to water and shade them; till they have taken new root, then they must be kept clear from weeds; in these beds they may remain till the end of *August*, by which time they will have grown so large as almost to meet each other; then prepare some more beds of the like good earth (in quantity proportionable to the flowers raised), in which they should be planted at six inches distance each way, and not above four rows in each bed, for the more conveniently laying such of them as may prove worthy preserving; for in these beds they should remain to flower.

The alleys between these beds should be two feet wide, that persons may pass between the beds to weed and clean them. If the season should prove very dry at this time, they should not be transplanted till there is some rain, so that it may happen to be the middle, or latter end of *September* some years, before there is wet enough to moisten the ground for this purpose; but if there is time enough for the plants to get good root before the frost comes on, it will be sufficient. If the winter should prove severe, the beds should be arched over with hoops, that they may be covered with mats, otherwise many of the plants may be destroyed, for the good flowers are not so hardy as the ordinary ones of this genus. There will be no other culture wanting to these, but to keep them clean from weeds, and when they shoot up their stalks to flower, they must be supported by sticks to prevent their breaking. When the flowers begin to blow, they must be looked over to see which of them proffer to make good flowers; as soon as that can be discovered, all the layers upon them should be laid; those which are well marked, and blow whole without breaking their pods, should be reserved to plant in borders, to

furnish seeds; and those which burst their pods, and seem to have good properties, should be planted in pots, to try what their flowers will be, when managed according to art; and it is not till the second year of flowering, that any person can pronounce what the value of a flower will be; but in order to be well acquainted with what the florists call good properties, I shall here set them down.

1. The stem of the flower should be strong, able to support the weight of the flower without nodding down.

2. The petals of the flower should be long, broad, and stiff, and pretty easy to expand, or (as the florists term them) should be free flowerers.

3. The middle pod of the flower should not advance too high above the petals in the other part of the flower.

4. The colours should be bright, and equally marked all over the flower.

5. The flower should be very full of leaves, so as to render it, when blown, very thick and high in the middle, and the outside perfectly round.

Having made choice of such flowers as promise well, these should be marked separately for pots, and the round whole blowing flowers for borders; all single flowers, or such as are ill-coloured and not worth preserving, should be drawn out, that the good flowers may have the more air and room to grow strong; when the layers of the good flowers have taken root (which will be some time in *August*), they should be taken off and planted out; those that blow large, in pots, and the other in borders (as hath been already directed).

Of late years, the whole-blowing flowers have been much more esteemed than those large flowers which burst their pods; but especially those round flowers which have broad stripes of beautiful colours, and round Rose leaves, of which kinds there have been a great variety introduced from *France*, within these few years; but as these *French* flowers are extremely apt to degenerate to plain colours, and being much tenderer than those which are brought up in *England*, there are not such great prices given for the plants now, as was a few years past: from the present taste for these whole-blowing flowers, many of the old varieties, which had been turned out of the gardens of the florists, have been received again; and large prices have been paid of late for such flowers as some years ago were sold for one shilling a dozen, or less, which is a strong proof of the variableness of the fancies of the florists.

I shall next proceed to give some directions for propagating these by layers, and the necessary care to be taken of them to have large and fair flowers.

The best season for laying these flowers is in *July*, as soon as the shoots are strong enough for that purpose: it is performed in the following manner: after having stripped off the leaves from the lower part of the shoot intended to be laid, make choice of a strong joint about the middle of the shoot (not too near the heart of the shoot, nor in the hard part next the old plant); then with a penknife make a slit in the middle of the shoot, from the under side of the joint upward half the way or more, to the joint next above it, according to the distance of the joints; then with your knife cut the tops of the leaves, and also cut off the swelling part of the joint where the slit is made, so that the part slit may be shaped like a tongue; (when that outward skin is pared off, which, if left on, would prevent their pushing out roots); having loosened the earth round the plant, and, if need be, raised it with fresh mould, that it may be level with the shoot intended to be laid, lest by the ground being too low, by forcing down the shoot it should be split off; then make a hollow place in the earth, just where the shoot is to come, and bend the shoot gently into the earth, observing to keep the top as upright as pos-

sible, that the slit may be open; and being provided with forked sticks for that purpose, thrust one of them into the ground, so that the forked part may take hold of the layer, to keep it down in its proper place; then gently cover the shank of the layer with the same sort of earth, giving it a gentle watering, to settle the earth about it, observing to repeat the same as often as is necessary, to promote their rooting. In about five or six weeks after this, the layers will have taken root sufficient to be transplanted; then those which are intended for pots, should be each planted in a separate small pot, placing them in the shade until they have taken fresh root; after which they may be removed into a more open situation, where they may remain till the middle of *November* (if the weather continues so long good) when the pots should be put under a common frame, where they may enjoy the open air at all times when the air is mild, but screened from hard rains, snow and frost.

Where there is conveniency, the layers, which are intended for the common borders, may be planted upon a bed at about three inches asunder each way, and in winter covered with a frame, or else arched over with hoops, and in bad weather covered with mats, which will secure them till spring, when they may be taken up with balls of earth, and planted where they are designed to flower.

Those layers, which were planted in small pots in the autumn, should, in the spring, be turned out of those pots, preserving the earth to their roots, paring off the outside with the matted roots, and put into the pots they are designed to remain for good. The best compost for these flowers is as follows:

Make choice of some good upland pasture, or a common that is of an hazel earth, or light sandy loam; dig from the surface of this about eight inches deep, taking all the turf with it; let this be laid in an heap to rot and mellow for one year, turning it once a month, that it may sweeten; then mix about a third part of rotten neat's dung, or for want of that some rotten dung from a Cucumber, or a Melon bed; let this be well mixed together, and if you can get it time enough before-hand, let them lie mixed six or eight months before it is used, turning it several times, the better to incorporate their parts. But as the layers, which are made from such roots as have been forced to flower the same year, do seldom succeed so well the next, it will be a good method to plant two or three layers of each of the best kinds in a bed of fresh earth not over dunged; which plants should only be suffered to shew their flowers, that their colours may be known to be perfect in their kind; and when satisfied in that particular, the flowers should be cut off the stems, and not suffered to spend the roots in blowing, by which means the layers will be strengthened. And from some of the best plants of these, the layers should be taken for the next year's blowing, always observing to have a succession of them yearly, by which means every year a fine bloom of these flowers may be expected, supposing the season favourable. When the plants which are intended to flower, are put into the larger pots in the spring, they should be placed in a situation where they may be defended from the north wind; observing to give them gentle waterings, as the season may require.

Here they may remain till the middle, or latter end of *April*, when a stage of boards should be made to set the pots upon, which should be so ordered as to have little cisterns of water round each post, to prevent the insects from getting to the flowers in their bloom; which, if they are suffered to do, they will destroy all the flowers in a short time: the chief and most mischievous insect in this case is, the earwig, which will gnaw off all the lower parts of the petals of the flowers (which are very sweet), and thereby cause the whole flower to fall to pieces; but since the making

ing one of these stages is somewhat expensive, and not very easy to be understood by such as have not seen them, I shall describe a very simple one, which I have used for several years, which answers the purpose full as well as the best and most expensive one can do. First, prepare some common flat pans, about two feet over, and three inches deep, place these two and two opposite to each other, at about two feet distance, and at every eight feet in length. In each of these turn a flower-pot upside down, then lay a piece of flat timber, about two feet and an half long, and three inches thick, cross from pot to pot, the whole length of the stage; then lay the planks lengthways upon these timbers, which will hold two rows of the size for these pots which are proper for the Carnations; and when you have set the pots upon the stage, fill the flat pans with water, always observing, as it decreases in the pans, to replenish it, which will effectually guard your flowers against insects, for they do not care to swim over water; so that if by this, or any other contrivance, the passage from the ground to the stage, on which the pots are placed, is defended by a surface of water four or five inches broad, and as much in depth, will effectually prevent these vermin from getting to the flowers.

This stage should be placed in a situation open to the south east, but defended from the west winds, to which these stages must not be exposed, lest the pots should be blown down by the violence of that wind, which is often very troublesome at the season when these flowers blow; indeed they should be defended by trees at some distance, from the winds of every point; but these trees should not be too near the stage, nor by any means place them near walls, or tall buildings, for in such situations the stems of the flowers will draw up too weak. About the middle of *April*, the layers will begin to shoot up for flower; therefore there should be provided some deal sticks, about four feet and an half long, which should be thicker toward the bottom, and planed off taper at the top; these sticks should be carefully stuck into the pots as near as possible to the plant, without injuring it; then with a slender piece of bass mat, fasten the stalk of the flower to the stick to prevent its being broken; this must be often repeated as the stalk advances in height, and all the side stalks must be pulled off as they are produced, never letting more than two stalks remain upon one root, nor above one, if they are intended to blow exceeding large. Toward the beginning of *June* the flowers will most of them have attained their height, and their pods will begin to swell, and about the end some of the earliest begin to open on one side; therefore the pods must be opened in two other places, at equal angles; this must be done as soon as the pod breaks, otherwise the flower will run out on one side, and be in a short time past recovering, so as to make a complete flower. In a few days after the flowers begin to open, they must be covered with glasses which are made for that purpose, in the following manner:

Upon the top of the glass, exactly in the center, is a tin collar, or socket, about three-fourths of an inch square, for the flower-stick to come through; to this socket are soldered eight slips of lead at equal distances, which are about six inches and an half long, and spread open at the bottom about four inches asunder; into these slips of lead are fastened slips of glass, cut according to the distances of the lead, which, when they are fixed in, are bordered round the bottom with another slip of lead quite round, so that the glass hath eight angles, with the socket in the middle, and spread open at the bottom about eleven inches wide.

When the flowers are open enough to be covered with these glasses, a hole must be made with an awl through the flower-stick, exactly to the height of the under part of the pod, through which should be put a piece of small wire

about six inches long, making a ring at one end of the wire to contain the pod, into which ring should the stem of the flower be fixed, taking off all the tyings of bass; and the stem of the flower must be placed so far from the stick, as may give convenient room for the flower to expand without pressing against it; to which distance it may be fixed, turning the wire so as not to draw back through the hole; then make another hole through the stick, at a convenient distance above the flower, through which should be put a piece of wire, an inch and an half long, to support the glasses from sliding down upon the flowers, observing that the glasses are not placed so high as to admit the sun and rain under them to the flowers, nor so low as to scorch their leaves with the heat. At this time also, or a few days after, should be cut some stiff paper, cards, or some such thing, into collars about four inches over, and exactly round, cutting a hole in the middle of it about three-fourths of an inch diameter, for the bottom of the flower to be let through; then place these collars about them, to support the petals of the flower from hanging down; this collar should be placed within side the calyx of the flower, and should be supported thereby. If, as the flowers blow, one side comes out faster than the other, the pots should be turned about, to shift the other side toward the sun; and, if the weather proves very hot, the glasses should be shaded in the heat of the day with Cabbage leaves, &c. to prevent their being scorched, or forced out too soon; and, when the middle pod begins to rise, the calyx must be pulled out with a pair of nippers made for that purpose; but this should not be done too soon, lest the middle part of the flower should advance too high above the sides, which will greatly diminish the beauty of it. And when the flowers are fully blown, if they are cut off, a fresh collar of stiff paper should be put on, which should be cut exactly to the size of the flower, that it may support the petals to their full width, but not to be seen wider than the flower in any part: when this is put on, the widest leaves should be spread out, to form the outside of the flower, which although they should happen to be in the middle (as is often the case), yet by removing the other leaves they may be drawn down, and so the next longest leaves upon them again, that the whole flower may appear equally globular without any hollow parts. In the doing of this, some florists are so curious as to render an indifferent flower very handsome; and on this depends, in a great measure, the skill of the artist to produce large fine flowers.

The directions here given are chiefly for the management of those large Carnations, which require the greatest skill of the florists, to have them in perfection; but as of late years these have not been so much in esteem as formerly, and those flowers which do not break their pods have now the preference. These are generally planted in pots, and treated in the same way as the large flowers, but do not require so much trouble to blow them: all that is necessary to be done for these, is to fasten their stems up to flower-sticks to prevent their being broken, and to take off the pods which proceed from the side of the stalks, leaving only the top bud to flower, if they are intended to be large and fair; and when the flowers begin to open, if they are screened from the sun in the heat of the day, and also from wet, they will continue much longer in beauty.

The layers which are planted in the full ground, generally produce seeds better than those in pots; therefore whoever proposes to raise a supply of new flowers from seeds, must always observe to save the best of their seedling flowers for this purpose; for it is well known, that after any of these flowers have been a few years propagated by layers, they become barren, and do not seed; which is also the case with many other plants, which are propagated by slips, layers, or cuttings; so that the young plants which have

been newly obtained from seeds, are always the most productive of seeds.

I shall next proceed to the culture of that species, which is commonly known by the title of Sweet William: of this there are a great variety of different colours, which are single, and three with double flowers: some of these have narrow leaves, which were formerly titled Sweet Johns, but of late that distinction has not been made, because they are found to vary when raised from seeds.

Some of the single flowers have very rich colours, which frequently vary in those of the same bunch; there are others with fine variegated flowers, and others whose middles are of a soft red, bordered with white, which are called Painted Ladies; but where persons are desirous to preserve any of these varieties in perfection, the best flowers of each should be particularly marked, and no other permitted to stand near them, lest their farina should impregnate them, which would cause them to vary.

That which is called the Painted Lady Sweet William, is a very beautiful variety; the stalks of this do not rise so high as most of the other; the bunches of flowers are larger, and produced more in the form of an umbel, the flowers standing equal in height, make a better appearance: there are others whose stalks rise three feet high, and the flowers are of a very deep red or scarlet colour. These all flower at the same time with the Carnations, which renders them less valuable, because they have no scent.

The single kinds of these flowers are generally propagated by seeds, which must be sown the beginning of *April*, in a bed of light earth, and in *June* they will be fit to transplant out, at which time must be prepared some beds ready for them; they should be planted six inches distance every way: in these beds they may remain till *Michaelmas*, at which time they may be transplanted into the borders of the pleasure-garden. These will flower the next year in *June*, and perfect their seeds in *August*, which you should save from the best coloured flowers for a supply.

The three sorts with double flowers, are: 1. The broad-leaved sort, which hath very double flowers, of a deep purple colour inclining to blue, which bursts its pods, so that it is not so much esteemed as the others, and therefore has been less regarded, and is now almost totally banished the gardens of the curious. 2. The Double Rose Sweet William, whose flowers are of a fine deep Rose-colour, and smell sweet; this is much valued for the beauty and sweetness of its flowers; the empalement (or pods) of these flowers never burst, so the flowers remain with their petals fully expanded, and do not hang down loosely as those of the former. 3. The Mule, or Fairchild's Sweet William; it hath narrower leaves than either of the former, and is of that variety called Sweet John: this was said to have been produced from seeds of a Carnation, which had been impregnated by the farina of the Sweet William; the flowers of this are of a brighter red colour than either of the former; their bunches are not quite so large, but their flowers have an agreeable scent.

The double kinds are propagated by layers, as the Carnations, or by slips as Pinks; they love a middling soil, not too light, nor too heavy or stiff, nor too much dunged, which very often occasions their rotting: these continue flowering for a long time, and are extremely beautiful; but they are very subject to canker and rot away, especially if planted in a soil over wet or too light. These flowers when planted in pots, are very proper to adorn court-yards at the time they are in flower.

The *China* Pink is generally esteemed an annual plant, because the plants which are raised from seeds flower and produce ripe seeds the same season, so their roots are not often preserved; but where they are planted in a dry soil,

they will continue two years, and the second year will produce a greater number of flowers than the first. There are a great variety of (very rich colours in these flowers, which annually vary when raised from seeds. The double flowers of this are most esteemed, though the colours of the single are more distinct and beautiful; for the multiplicity of petals in the double flowers, in a great measure hide the deep shades, which are toward the lower part of the petals.

These plants are propagated by seeds, which should be sown upon a gentle hot-bed about the beginning of *April*; this moderate heat is only intended to forward the vegetation of the seeds, therefore when the plants come up, they must have a large share of air admitted to them, to prevent their drawing up weak; and as soon as the weather will permit, they must be exposed to the open air; in about a month after, the plants will be fit to remove, when they should be carefully taken up with good roots, and planted in a bed of rich earth, at about three inches asunder, being careful to shade them from the sun till they have taken new root. The farther care is to keep them clean from weeds till the end of *May*, at which time they may be transplanted to the places where they are designed to remain for flowering, when they may be taken up with large balls of earth to their roots, so as scarcely to feel their removal, especially if it happens to rain at that time.

As these plants do not grow large, so when they are planted singly in the borders of the flower-garden, they do not make so fine an appearance, as where they are planted by themselves in beds; or if they are planted in small clumps, of six or eight roots in each, where the flowers being of different colours, set off each other to advantage.

Those who are curious in these flowers, take particular care in saving their seeds, for they never permit any single flowers to stand among their double, but pull them up as soon as they shew their flowers, and also draw out all those which are not of lively good colours; where this is observed, the flowers may be kept in great perfection; but where persons have trusty friends, who live at some distance, with whom they can exchange seeds once in two or three years, it is much better so to do, than to continue sowing seeds in the same place many years in succession, and this holds true in most sorts of seeds: but the great difficulty is to meet with an honest person of equal skill, who will be as careful in the choice of his plants for seed, as if he was to sow them himself.

DIAPENSIA. See Sanicula.

DICTAMNUS. *Lin. Gen. Plant.* 468.

The Characters are,

The flower hath five petals which are unequal, and ten stamina which are as long as the petals. In the center is situated a five-cornered germen, which afterward becomes a capsule with five cells joined together, inclosing several roundish, hard, shining seeds.

We have but one distinct Species of this genus, viz.

DICTAMNUS. *Hort. Cliff.* 161. White Dittany, commonly called Fraxinella.

There are three varieties of this plant, one with a pale red flower striped with purple, another with a white flower, and one with shorter spikes of flowers; but as I have observed them to vary when propagated by seeds, so I esteem them only seminal varieties.

This is a very ornamental plant for gardens, and as it requires very little culture, so deserves a place in all good gardens. It hath a perennial root, which strikes deep into the ground; the head annually increases in size; it sends up many stalks, in proportion to its bigness, which rise from two to three feet high, garnished with winged leaves placed alternate; they are composed of three or four pair of oblong lobes, terminated by an odd one, which are smooth
and

and stiff, sitting close to the midrib; the lobes placed on each side the midrib, are oblique, but those which terminate the leaf have their sides equal. The flowers are produced in a long, pyramidal, loose spike, or thyrse, on the top of the stalk, which is nine or ten inches long; the flowers of one sort is white, and the other of a pale red marked with red or purple stripes. The whole plant when gently rubbed, emits an odour like that of Lemon peel, but when bruised has something of a balsamick scent.

These plants are propagated by seeds, which, if sown in the autumn, soon after they are ripe, the plants will appear the following April; but when they are kept out of the ground till the spring, the seeds seldom succeed; or if they do grow, it is the following spring before the plants appear, so that a whole year is lost. When the plants come up, they must be constantly kept clean from weeds; and in the autumn, when their leaves decay, the roots should be carefully taken up, and planted in beds at six inches distance every way; these beds may be four feet broad, and the paths between them two, that there may be room enough to pass between the beds to weed them. In these beds the plants may stand two years, during which time they must be constantly kept clean from weeds; and if they thrive well, they will be strong enough to flower; so in the autumn they should be carefully taken up, and planted in the middle of the borders of the flower-garden, where they will continue thirty or forty years, producing more stems of flowers in proportion to the size of the roots. All the culture these require is to be kept clean from weeds, and the ground about them dug every winter.

DICTAMNUS CRETICUS. See Origanum.

DIERVILLA, *Tourn. Aët. R. Par.* 1706.

The Characters are,

The flower is of one leaf, cut into five parts at the top; it hath five stamina, which are equal with the petal; at the bottom of the flower is situated an oval germen, which afterward becomes a pyramidal berry, divided into four cells, which contain small round seeds.

We know but one Species of this genus at present, viz.

DIERVILLA *Acadiensis fruticosa, flore luteo. Aët. R. Par.* 1706. Shrubby Diervilla of Acadia, with a yellow flower.

This plant grows naturally in the northern parts of America; it hath woody roots which spread far in the ground, and put out shoots at a distance from the principal stalk, whereby it multiplies greatly: the stalks are ligneous, and seldom rise more than two feet high, and are garnished with oblong heart-shaped leaves, ending in acute points, which are very slightly sawed on their edges, and are placed opposite, sitting close to the stalks; the upper part of the stalk is garnished with flowers, which come out from the side, and also at the top of the stalks, two or three together sustained upon short foot-stalks: they are of a pale yellow, and being small make no great appearance.

It is easily propagated by suckers, which it sends out in plenty, and loves a moist soil and shady situation, where the cold will never injure it.

DIGITALIS. *Lin. Gen. Plant.* 676. Foxglove:

The Characters are,

The flower is bell-shaped, of one petal, with a large open tube, whose brim is slightly divided into five parts; it hath four stamina, which are inserted in the base of the petal, two being longer than the other; the germen afterward swells to an oval capsule, having two cells inclosing many small angular seeds.

The Species are,

1. DIGITALIS *calycinis foliolis ovatis acutis, corollis obtusis, labio superiore integro. Hort. Upsal.* 178. Common or purple Foxglove with a rough leaf.

2. DIGITALIS *calycinis foliolis acutis, corollis acutis, labio superiore bifido. Lesser Spanish purple Foxglove.*

3. DIGITALIS *calycinis foliolis acutis, corollis obtusis, labio superiore integro, foliis lanceolatis obtusis. Lesser yellow Foxglove, with a small flower.*

4. DIGITALIS *foliolis calycinis acutis, corollis obtusis, labio superiore trifido, foliis oblongo cordatis acutis. Greater Foxglove, with a small yellow or pale flower.*

5. DIGITALIS *foliolis calycinis linearibus, corollis acutis, labio superiore integro, foliis lanceolatis. Yellow Foxglove, with a larger yellow flower.*

6. DIGITALIS *calycinis foliolis ovatis obtusis, corollæ labio inferiore longitudine floris. Lin. Sp. Plant.* 622. Narrow-leaved Foxglove, with an iron-coloured flower.

7. DIGITALIS *calycinis foliolis lanceolatis, corollis bilabiatis acutis, caule fruticoso. Lin. Sp. Plant.* 622. Shrubby Canary Foxglove like Bearsbreech, with a golden flower.

The first sort grows naturally by the side of hedges and in shady woods in most parts of England, so is rarely cultivated in gardens; it is a biennial plant, which the first year produces a great tuft of oblong rough leaves; the second year it shoots up a strong herbaceous stalk, which rises from three to five feet high, garnished with leaves of the same form as the lower, but they gradually lessen upward; the flowers grow in a long loose thyrse, standing only on one side of the stalk; they are large, tubulous, and shaped like a thimble, of a purple colour, with several white spots on the under lip; these are succeeded by oval capsules with two cells, which are filled with dark brown seeds: whoever has a mind to cultivate it, should sow the seeds in autumn, for those which are sown in the spring seldom succeed.

There is a variety of this with a white flower, which is found growing naturally in some parts of England, which differs from this only in the colour of the flower; but this difference is premanent.

The second sort grows naturally in Spain; this seldom rises much more than a foot high; the lower leaves are ten inches long, and three broad in the middle; they are soft, woolly, and roughly veined on their under side; the stalks are garnished with leaves of the same shape, but smaller; the upper part of the stalk hath a short thyrse of purple flowers, like those of the common sort, but smaller, and the segments of the petal are acute: this plant retains its difference when cultivated in gardens.

The third sort hath very long obtuse leaves near the root; the stalk is small, and rises from two to three feet high, the lower part being pretty closely garnished with smooth leaves, about three inches long and one broad, ending in obtuse points: the upper part of the stalk, for ten inches in length, is adorned with small yellow flowers, which are closely ranged on one side, having a few very small acute leaves placed between them, which are situated on the opposite side of the stalk; the upper lip of the flower is entire, and the petal is obtuse.

The fourth sort differs from the third in having shorter leaves, which end in acute points, and no indentures on their edges; the flowers are larger, and the upper lip is divided into three parts.

The fifth sort hath long, smooth, veined leaves at the bottom; the stalk is strong, and rises two feet and a half high, garnished with leaves which are five inches long, one and a half broad, ending in acute points; these have many longitudinal veins, and are slightly sawed on their edges; the upper part of the stalk is adorned with large yellow flowers, nearly of the size of those of the common sort, the brim having acute points, and the upper lip entire.

The sixth sort hath narrow smooth leaves, which are entire; the stalk rises five or six feet high; the lower part of the stalk is garnished with very narrow small leaves; the flowers terminate the stalk, growing in a long spike, with very few leaves between them, and those very small; the

empalement is divided into four obtuse parts, the lower lip extending much longer than the upper; the flowers are of an iron colour; there is a variety of this with broader leaves.

The seventh sort grows naturally in the *Canary Islands*; this plant hath a shrubby stalk, which rises to the height of five or six feet, dividing into several branches, garnished with rough spear-shaped leaves near five inches long, and one and a half broad in the middle, with a few short serratures on their edges; they are placed alternately on the branches; each of the branches is terminated by a loose spike of flowers, about six inches in length; the empalement is cut into five acute segments almost to the bottom; the upper lip is long and entire, this is arched, and immediately under it the stamina and style are situated; the lower lip is obtuse, and indented at the top; there are two acute segments on the side, which compose the chaps of the flower; two of the stamina are longer than the other; in the bottom of the flower is situated the germen, supporting a slender style, crowned by an oval stigma; the germen afterward becomes an oval capsule, filled with small angular seeds.

This plant begins to flower in *May*, and there is generally a succession of flowers on the same plant, till the winter puts a stop to them, which renders the plant more valuable; it is propagated by seeds, which should be sown in pots in the autumn, soon after the seeds are ripe; these pots should be plunged into an old bed of tanners bark, whose heat is gone, and in mild weather the glasses should be drawn off to admit the air; but in hard rains and frost they must be kept on to protect the seeds from both, which frequently destroys them; in the spring the plants will come up, when they should enjoy the free air in mild weather, but must be protected from the cold: as soon as these are large enough to transplant, they should be each put into a separate small pot, and placed under the frame till they have taken new root, then they should be gradually inured to the open air. During the summer season the plants should remain abroad in a sheltered situation; but in the autumn they must be placed in a green-house, for they will not live abroad in winter: they must not be kept too warm and close in the house, for they only want protection from the frost.

All these sorts should be sown in the autumn, for if the seeds are sown in the spring they commonly fail, or at least lie a whole year in the ground before they vegetate. The plants are biennial (except the seventh sort) and perish soon after their seeds are ripe.

DIOSCOREA. *Plum. Nov. Gen. 9. tab. 26. Lin. Gen. Plant. 995.*

The Characters are,

It hath male and female flowers in different plants; the male flowers hath a perianthium cut into six parts, and have no petals, but have six short hairy stamina; the female flowers have the same perianthium, they have no petals, but have a three-cornered germen; the perianthium afterward becomes a triangular capsule with three cells, opening with three valves, containing two compressed bordered seeds in each.

The Species are,

1. DIOSCOREA *foliis cordatis alternis, caule lævi. Hort. Cliff. 459.* Climbing Dioscorea, with black Briony leaves, and fruit growing in long bunches.

2. DIOSCOREA *foliis hastato-cordatis, caule lævi, racemis longissimis.* Climbing Dioscorea, with a spear-pointed leaf, and fruit growing in long bunches.

3. DIOSCOREA *foliis cordatis rotundis, alternis, caule volubili lævi.* Climbing Dioscorea, with a roundish pointed leaf, and fruit growing in long bunches.

4. DIOSCOREA *foliis cordatis, caule alato bulbifera. Flor. Zeyl. 360.* Dioscorea with heart-shaped leaves, and a winged stalk bearing bulbs, commonly called Yam.

5. DIOSCOREA *foliis cordatis alternis oppositifque, caule lævi. Lin. Sp. Plant. 1033.* Dioscorea with heart-shaped leaves, growing alternate and opposite, and a smooth stalk.

The first sort grows naturally in most of the islands in the *West-Indies*; this hath slender climbing stalks, which fix themselves to any support near them, and rise to the height of eighteen or twenty feet, garnished with heart-shaped leaves ending in acute points, with five longitudinal veins, which arise from the foot-stalk, and diverge towards the sides, but meet again at the point of the leaves; they stand upon pretty long foot-stalks, from the base of which arise the branching spikes of flowers, which are small, and have no beauty; the female flowers are succeeded by three-cornered oblong capsules, having three cells, each containing two compressed seeds.

The second sort differs from the first in the shape of its leaves, these having two round ears at their base, but the middle extends to an acute point, like that of an halbert. The bunches of flowers are longer, and they are looser placed than those of the former sort.

The third sort hath broad, round, heart-shaped leaves, ending in acute points, having many longitudinal veins, which arise from the foot-stalk, and diverge to the side, but afterward join at the point of the leaf; the flowers come out on long loose strings, standing on short foot-stalks; the female flowers are succeeded by three-cornered oblong capsules, with three cells, having compressed bordered seeds.

The fourth sort hath triangular winged stalks, which trail upon the ground and extend to a great length; these frequently put out roots from their joints, as they lie upon the ground, whereby the plants are multiplied. The roots of this plant are eaten in many parts of both *Indies*, where the plants are much cultivated.

The fifth sort grows naturally in *Virginia*, and in other parts of *North-America*; this hath a smooth stalk, which climbs on the neighbouring plants, and rise five or six feet high, garnished with heart-shaped leaves, which are placed sometimes alternate, and at others they are opposite, and have several longitudinal veins; the flowers come out from the side of the stalk in the same manner as the other sorts, but have no beauty.

These plants may be propagated by laying their branches into the ground, which in about three months will put out roots, and may then be taken from the old plants, and planted into separate pots, which should be plunged into the tan-bed in the stove; during the winter, these plants should have but little water given them; but in summer, when they are growing vigorously, they require more; in warm weather they should have a large share of air. When the seeds of these plants are brought to *England*, they should be immediately sown in pots, and plunged in a hot-bed, where, if the seeds are fresh, the plants will come up in two months; but sometimes they remain in the ground till the following spring before the plants appear; therefore, when the plants do not come up the first season, the pots should be screened from the frost in the winter, and put into a new hot-bed in the spring, which will bring up the plants.

The fourth sort is much cultivated by the inhabitants of the islands in *America*, and is of great use to them for feeding of their negroes; and the white people make puddings of their roots, when ground to a sort of flour. This plant is supposed to have been brought from the *East* to the *West-Indies*, for it has not been discovered to grow wild in any part of *America*; but in the island of *Ceylon*, and on the coast of *Malabar*, it grows in the woods, and there are in those places a great variety of sorts.

This plant is propagated by cutting of the root into pieces, observing to preserve an eye or bud to each, as is practised in planting of potatoes; each of these being planted will grow,

grow, and produce three or four large roots: in *America* they are commonly six or eight months in the ground before the roots are taken up for use; the roots are roasted or boiled, and eaten by the inhabitants, and sometimes are made into bread.

This plant will not thrive in the open air, in the warmest time of the year, so must constantly be kept in the bark-stove.

DIOSMA. *Lin. Gen. Plant.* 241. *African Spiræa*, vulgò.

The Characters are,

The flower hath five obtuse petals, which are as long as the empalement, and five stamina, with a five-pointed hollow nectarium sitting on the germen, which afterward becomes a fruit composed of five compressed capsules, joined together, each inclosing one smooth oblong seed.

The Species are,

1. DIOSMA *foliis subulatis acutis oppositis*. *Hort. Cliff.* 71. *African Spiræa*, with leaves placed in the form of a cross.

2. DIOSMA *foliis linearibus hirsutis*. *Hort. Cliff.* 71. *Diosma* with narrow hairy leaves.

3. DIOSMA *foliis linearibus acutis glabris, subtus bifarium punctatis*. *Lin. Sp. Plant.* 198. *Diosma* with smooth, narrow, acute leaves, which are spotted on their under side.

4. DIOSMA *foliis lineari-lanceolatis subtus convexis, bifariam imbricatis*. *Lin. Sp. Plant.* 198. *African Spiræa*, with leaves like the berry-bearing Heath.

The first sort rises to the height of three or four feet; the branches are slender, and produced from the stem very irregularly; the leaves are placed crossways; the flowers are produced at the end of the branches, between the leaves: these plants continue a long time in flower, and make a fine appearance when they are intermixed with other exoticks in the open air.

The second sort makes a very handsome shrub, growing to the height of five or six feet: the stalks are of a fine coral colour; the leaves come out alternately on every side of the branches, which are narrow-pointed and hairy: the flowers are produced in small clusters at the end of the shoots, which are small and white; these are succeeded by starchy seed vessels, having five corners like those of the starchy Anise; each of these corners is a cell, having one smooth, shining, oblong, black seed: these seed vessels abound with a resin, which affords a grateful scent, as doth also the whole plant.

The third sort rises from two to three feet high, forming a bushy head; the leaves are smooth, narrow, and acute-pointed, having two or three spots on their under side; the flowers are small, of a blush colour, and come out at the end of the shoots; but this sort rarely produces seeds in *England*.

The fourth sort is of humbler growth than either of the former, seldom rising above two feet high, and spreads out into many branches; the leaves of this sort are smooth, and resemble those of the Heath; and the plant from thence had the name of *Erica Æthiopica*, &c. given to it by Dr. *Plukenet*: the flowers of this kind are produced in clusters at the end of the branches, like those of the second sort, but are smaller, and the bunches not so large.

All these plants are propagated by cuttings, which may be planted during any of the summer months in pots, and plunged into a moderate hot-bed, where they should be shaded in the day time from the sun, and frequently refreshed with water; in about two months the cuttings will have taken root, when they should be each transplanted into a small pot, and placed in a shady situation until they have taken fresh root, when they may be placed among other exotick plants, in a sheltered situation: the plants may remain abroad until the beginning of *October* or later, if the season continue favourable, for they only require to be sheltered from frost; so that in a dry airy green-house they may be preserved very well in winter, and in summer they

may be exposed to the open air, with other green-house plants.

DIOSPYROS. *Lin. Gen. Plant.* 1027. The Indian Date Plumb.

The Characters are,

It hath hermaphrodite and male flowers on separate plants; the hermaphrodite flowers have a large, obtuse, permanent empalement, divided into four parts; the flower hath one pitcher-shaped petal, cut at the brim into four segments, and eight short bristly stamina firmly joined to the empalement; in the center is situated a roundish germen, which afterward becomes a large globular berry with cells, each including one oblong, compressed, hard seed; the male flowers have the same calyx and flower, with eight short stamina, but have no germen.

The Species are,

1. DIOSPYROS *foliorum paginis discoloribus*. *Lin. Sp. Plant.* 1057. *Diospyros*, with the surface of the leaves of two colours, or the Indian Date Plumb.

2. DIOSPYROS *foliorum paginis concoloribus*. *Lin. Sp. Plant.* 1057. The Pishamin or Persimon, and by some Pitchumon Plumb.

The first sort is supposed to be a native of *Africa*, and was transplanted from thence into several parts of *Italy*, and also the south of *France*. The fruit of this tree is by some supposed to be the Lotus, which *Ulysses* and his companions were enchanted with. This is a tree of a middling growth in the warm parts of *Europe*, where it rises upward of thirty feet high; in the botanick garden at *Padua* there is one very old tree, which has been described by some of the former botanists, under the title of *Guaiacum Patavinum*. This tree produces plenty of fruit every year, from the seeds of which many plants have been raised.

The second sort is a native of *America*, but particularly in *Virginia* and *Carolina*; the seeds of this sort are frequently brought to *England*, where the trees are now become pretty common in nurseries about *London*. This rises to the height of twelve or fourteen feet, but generally divides into many irregular trunks near the ground, so that it is very rare to see a handsome tree of this sort: it produces plenty of fruit in *England*, but they never come to perfection here: in *America*, the inhabitants preserve the fruit until it be rotten (as is practised by *Medlars* in *England*) when they are esteemed a pleasant fruit.

Both sorts are propagated by seeds, which will come up very well in the open ground; but if they are sown upon a moderate hot-bed, the plants will come up much sooner, and make a greater progress; but in this case the seeds should be sown in pots or boxes of earth, and plunged into the hot-bed, because the plants will not bear transplanting till autumn, when the leaves fall off; so that when the plants are up and have made some progress, they may be inned by degrees to the open air; and in *June* they may be wholly exposed, and may remain abroad until *November*, when it will be proper to set the pots under a hot-bed frame to protect them from hard frost; which, while they are very young, may kill the tops of the plants; but they must have as much free air as possible in mild weather: the following spring, before the plants begin to shoot, they should be transplanted into a nursery, in a warm situation, where they may be trained up for two years, and then removed to the places where they are designed to remain. These are both hardy enough to resist the greatest cold of this country, after the plants have acquired strength.

DIPSACUS. *Lin. Gen. Plant.* 107. The Teazel.

The Characters are,

It hath many florets collected in one common perianthium; they have but one petal, which is tubular, cut into four parts at the top. They have four hairy stamina. The germen is situated below the flower, which afterward becomes a column-shaped seed, inclosed

closed in the common conical fruit, which is divided by long prickly partitions.

The Species are,

1. *DIPSACUS foliis sessilibus serratis, aristis fructibus erectis.* Wild. Teazel.

2. *DIPSACUS foliis connatis, aristis fructibus recurvis.* Cultivated Teazel.

3. *DIPSACUS foliis connatis sinuatis.* Lin. Sp. Plant. 97. Teazel with a lacinated leaf.

4. *DIPSACUS foliis petiolatis appendiculatis.* Hort. Upsal.
25. Wild Teazel with a smaller head, or smaller Shepherd's Rod.

The first of these plants is very common upon dry banks in most parts of *England*, and is seldom cultivated in gardens, unless for the sake of variety.

The fourth sort grows naturally in many places near *London*, and is rarely admitted into gardens.

The third sort grows naturally in *Alsace*, and is kept in botanick gardens for the sake of variety; this differs from the wild Teazel, in having the leaves deeply cut and jagged.

But it is the second sort only which is cultivated for use, which is called *Carduus Fullorum*, or *Fullonum*, being of singular use in raising the knap upon woollen cloth; for which purpose there are great quantities of this plant cultivated in the west country.

This plant is propagated by sowing the seeds in *March*, upon a soil that has been well prepared. About one peck of seed will sow an acre; for the plants should have room to grow, otherwise the heads will not be so large, nor in so great quantity. When the plants are come up, they must be hoed in the same manner as is practised for Turneps, cutting down all the weeds, and singling out the plants to about eight inches distance; and as the plants advance, and the weeds begin to grow again, they must be hoed a second time, cutting out the plants to a wider distance; for they should be, at last, left at least a foot asunder: and should be kept clear from weeds, especially the first summer; for when the plants have spread so as to cover the ground, the weeds will not so readily grow between them. The second year after sowing, the plants will shoot up heads, which will be fit to cut about the beginning of *August*; at which time they should be cut, and tied up in bunches, setting them in the sun, if the weather be fair; but if not, they must be set in rooms to dry them. The common produce is about an hundred and sixty bundles or staves upon an acre, which they sell for one shilling a stave. Some people sow Caraway and other seeds amongst their Teazels, but this is not a good method, for the one spoils the other; nor can the weeds be so well cleaned away from the Teazels.

DIRCA. Lin. Gen. 1078.

The Characters are,

The flower is tubulous, has no empalement; it has eight stamina, which are longer than the tube. The flower is succeeded by a berry with one cell, including a single seed.

There is but one sort of this genus, viz.

DIRCA. Lin. Gen. Nov. 1078. The French call it *Bois de Plomb*, i. e. Leadwood: the English in *America* call it Leatherwood, from its lightness.

This is a low shrub in this country; it seldom rises more than four or five feet high, and is very nearly allied to the Mezereon; the flowers come out early in the spring before the leaves; they are small, tubulous, and of a light herbaceous colour, so make very little appearance. The leaves are oval, smooth, and of a pale green; they fall off in the autumn; the shoots are jointed like knees.

It grows naturally in moist places in *North America*, but is at present pretty rare in the English gardens. It may be propagated by layers, but they are commonly two years

before they put out roots. It should have a moist soil and a shady situation.

DITTANY, the white. See *Dictamnus*.

DOCK. See *Rumex*.

DODARTIA. Lin. Gen. Plant. 698.

The Characters are,

The empalement is cut into five parts at top; the flower hath one petal; the upper lip is twice as long as the lower. It hath four stamina, two of which are shorter than the other. In the center is situated a round germen, which after-ward becomes a globular capsule with two cells, filled with small seeds.

The Species are,

1. *DODARTIA foliis linearibus integerrimis glabris.* Lin. Sp. Pl. 633. *Dodartia* with very narrow, smooth, entire leaves.

2. *DODARTIA foliis radicalibus oblongo-ovatis, serratis, caulibus linearibus integerrimis floribus spicatis terminalibus.* *Dodartia* with oblong, oval, sawed leaves at the bottom, those on the stalk narrow and entire, and flowers growing in spikes at the end of the stalks.

The first sort was discovered by Dr. *Tournefort* near mount *Ararat* in *Armenia*. It hath a perennial root which creeps far in the ground, and sends out stalks at a great distance from the parent plant; the stalks are firm, a little compressed, and grow a foot and an half high, sending out several side branches, garnished with long, fleshy, narrow leaves placed opposite; those on the lower part of the stalk are shorter and broader than those above, and have two or three sharp indentures on their edges. At the joints the flowers come out singly on each side the stalk, sitting close to it; they are tubulous, but divide into two lips; the upper lip is hollow like a spoon, and is divided into two parts; the lower lip is divided into three parts, the middle being the narrowest. The flower is of a deep purple colour, but is rarely succeeded by seeds in *England*. It propagates very fast by its creeping roots, so that when it is once established in a garden, it will multiply fast enough.

The second sort is a biennial plant, which perishes soon after the seeds are ripe; this sends out several oblong leaves from the root, which are narrow at their base, but increases in width upward, and are rounded at the end: between these arise the stalks which grow a foot high, their lower parts being garnished with leaves of the same form as the lower leaves, but much smaller, the upper leaves are very narrow and entire. The flowers grow in spikes at the top of the stalks, they are very small and white, but are shaped like those of the former sort.

This is propagated by seeds, which should be sown in autumn, soon after they are ripe, upon a border of light earth, where they are designed to remain. When the plants appear the following spring, they must be thinned, and kept clean from weeds, which is all the culture they require; the second year they will flower and seed, after which the plants decay; when the seeds are sown in the spring, the plants never come up the same year.

DOG'S TOOTH. See *Erythronium*.

DOG-WOOD. See *Cornus*.

DORIA. See *Solidago* and *Othonna*.

DORONICUM. Lin. Gen. Pl. 862. Leopard's Bane.

The Characters are,

It hath a flower composed of several hermaphrodite florets, which form the disk, and female florets which compose the rays; these are included in one common empalement, which hath a double series of leaves, as long as the rays. In the bottom of the hermaphrodite florets is situated the germen, which after-ward becomes a single, oval, compressed seed, crowned with hairy down. The female florets are formed like a tongue, and compose the border; these have a germen crowned by two reflexed stigmas, but have no stamina; the germen becomes a single furrowed seed without down.

The Species are,

1. *DORONICUM foliis cordatis obtusis, radicalibus petiolatis, caulinis amplexicaulibus. Lin. Mat. Med. 394.* Leopard's Bane with obtuse heart-shaped leaves, those from the root having foot-stalks, and those above embracing the stalks.

2. *DORONICUM foliis ovatis acutis, subdentatis, ramis alternis. Hort. Cliff. 411.* Leopard's Bane with oval-pointed leaves indented at bottom, and alternate branches.

3. *DORONICUM caule nudo simplicissimo unifloro. Hort. Cliff. 500.* Leopard's Bane with a naked single stalk having one flower.

The first sort grows naturally in *Hungary*, and upon the *Helvetian* mountains, but is frequently preserved in the *English* gardens. It hath thick fleshy roots, which divide into many knots or knees, sending out strong fleshy fibres, which penetrate deep into the ground; from these arise in the spring, a cluster of heart-shaped leaves, which are hairy, and stand upon foot-stalks; between these arise the flower-stalks, which are channelled and hairy, near three feet high, putting out one or two smaller stalks from the side, which grow erect, and are garnished with one or two heart-shaped leaves, closely embracing the stalks with their base; each stalk is terminated by one large yellow flower, composed of about twenty-four rays or female florets, long, plain, and indented in three parts at the top. In the center is situated a great number of hermaphrodite florets, which compose the disk; these are tubulous, and slightly cut at the top in five parts.

This plant multiplies very fast by its spreading roots, and if the seeds are permitted to scatter, they will produce plants where-ever they happen to fall, so that it becomes a weed where it is once established; it loves a moist soil and a shady situation.

The second sort hath oval leaves ending in acute points; these are indented on their edges toward their base, but their upper parts are entire; the stalks rise about two feet high, each is terminated by a large yellow flower like those of the former sort; the stalks of this sort have two or three leaves, which are placed alternately, and their base fits close to the stalks; these are not so hairy as those of the former sort. This grows naturally in *Portugal*, *Spain*, and *Italy*, but is equally hardy with the first, and multiplies in as great plenty; the root is perennial.

The third sort grows naturally on the *Alps* and the *Pyrenean* mountains; it hath a perennial root; the leaves are like those of the lesser Daisy, but longer, and not so broad. The flower grows upon a naked foot-stalk, which is near a foot long; the roots seldom send out more than one stalk; the rays of the flower are white, and very like those of the common Daisy; the disk of the flower is yellow, which is composed of hermaphrodite flowers.

This plant is preserved in botanick gardens for the sake of variety, but the flowers make little better appearance than those of the common Field Daisy, only they stand upon much taller foot-stalks. It must have a shady situation and a moist soil, otherwise it will not thrive in this country; it is propagated by parting of the roots, for the seeds do not ripen well in *England*.

The roots of the first sort have been sometimes used in medicine; some have commended it as an expeller of the poison of scorpions, but others reckon it to be a poison, and affirm that it will destroy wolves and dogs.

DORSTENIA. Plum. Nov. Gen. 29. tab. 8. Lin. Gen. Plant. 147. Contrayerva.

The Characters are,

It hath one common involucre situated vertically, upon which sit many small flowers which have no petals, but have four short stamina. In the center is situated a roundish germen, which afterward becomes a single seed, inclosed in the common fleshy receptacle.

The Species are,

1. *DORSTENIA foliis sinuatis obtusis, placenta ovali, marginibus integris.* Contrayerva with obtuse sinuated leaves, and an oval placenta with entire borders.

2. *DORSTENIA foliis cordato-angulatis acutis, placenta quadrangulari dentato.* Contrayerva with angular, heart-shaped, acute leaves, and a quadrangular placenta which is indented.

3. *DORSTENIA foliis palmato-angulatis, angulis acutis, placenta oblonga tetragono.* Contrayerva with angular handed leaves, whose angles are very acute, and an oblong four-cornered placenta.

The first of these plants was discovered by my late ingenious friend *Dr. William Houstoun*, near *Old La Vera Cruz* in *New Spain*. The second was found by the same gentleman, on the rocky grounds about *Campeachy*. The third sort was found in great plenty in the island of *Tobago*, by *Mr. Robert Millar*, Surgeon. But the roots of all these species are indifferently brought over, and used in medicine, and for dying.

The first sort sends out several leaves from the root, which are about four inches long, and as much in breadth, deeply lacinated into five or seven obtuse parts, standing upon long foot-stalks; they are smooth, of a deep green. The stalk which supports the placenta arises from the root, is four inches high, upon which the fleshy placenta is vertically placed; this is of an oval form about an inch long, and three quarters broad. Upon the upper surface of this, the small flowers are closely situated, the fleshy part becoming an involucre to them; these are very small, and scarce conspicuous at a distance, being of an herbaceous colour.

The second sort sends out several angular heart-shaped leaves from the root, which have foot-stalks eight or nine inches in length and very slender; the leaves are about three inches and an half long, and almost four broad at their base, the two ears having two or three angles which are acute, and the middle of the leaves are extended and end in acute points like an halbert; they are smooth and of a lucid green; the foot-stalk which sustains the placenta is nine inches long, and about half an inch square; the upper surface is closely set with small flowers like the first.

The third sort sends out leaves of different forms; some of the lower leaves are heart-shaped having a few indentures on their edges, ending in acute points, but the larger leaves are deeply cut like the fingers on a hand, into six or seven acute segments. They are five inches long, and six broad in the middle, of a deep green, and stand upon long foot-stalks. The placenta is very thick and fleshy, an inch and an half long, and three quarters broad, having four acute corners; these have a number of small flowers placed on the upper surface, like the other species.

These plants are at present very rare in *Europe*, nor was it known what the plant was, whose roots were imported, and had been long used in medicine in *England*, until the late *Dr. Houstoun* informed us: for although father *Plumier* had discovered one species of this plant, and given the name of *Dorstenia* to the genus, yet he seems not to have known, that the *Contrayerva* was the root of that plant.

It will be difficult to obtain these plants, because the seeds are seldom to be found good; nor will they grow, if they are kept long out of the ground; so that the only sure method to obtain them is, to have the roots taken up at the time when their leaves begin to decay, and planted very close in boxes of earth, which may be brought very safe to *England*, provided they are preserved from salt water, and are not over watered with fresh in their passage.

When the plants arrive, they should be each transplanted into a separate pot, and plunged into the bark stove, which should be kept of a moderate heat; they may be increased by parting their roots in the spring, before the plants put out their leaves.

DORYCNIUM. See Lotus.

DOUGLASSIA. See Volkameria.

DRABA. Dillen. Gen. Lin. Gen. Pl. 714.

The Characters are,

The flower hath four petals in form of a cross, and six stamina, four of which are as long as the empalement, the other two are much shorter. In the center is situated a bifid germen, which afterward becomes an oblong, oval, entire pod, with two cells, separated by the swelling style, which is oblique. The valves are parallel to the middle, and opens oblique, each cell containing a single seed.

The Species are,

1. DRABA scapo nudo simplici, foliis lanceolatis integerrimis. Fl. Lapp 255. Yellow hairy Alpine Madwort.
2. DRABA scapis nudis, foliis subserratis. Lin. Syst. Draba with naked stalks and cut leaves.
3. DRABA scapo nudo, foliis cuneiformibus trifidis. Lin. Syst. Least perennial Madwort of the Pyrenees with trifid leaves.
4. DRABA caule ramoso, foliis cordatis dentatis amplexicaulis. Prod. Leyd. 33. Draba with a branching stalk, and heart-shaped indented leaves embracing the stalks.
5. DRABA caule ramoso, foliis ovatis sessilibus dentatis. Lin. Sp. Pl. 643. Draba with a branching stalk, and oval indented leaves growing close to the branches.
6. DRABA foliis caulinis numerosis incanis, siliiculis obliquis. Flor. Suec. 526. Draba with many hoary leaves on the stalks, and oblique pods.

The first sort grows naturally on the Alps, and other mountainous parts of Europe. It is a very low plant, which divides into small heads, like some sorts of Houseleek, and from thence it was titled *Sedum Alpinum*, &c. or *Alpine Houseleek*. The leaves are short, narrow, and hairy; from each of these heads come out a naked flower-stalk an inch and an half high, terminated by a loose spike of yellow flowers, having four obtuse petals placed in form of a cross; when these fade, they are succeeded by heart-shaped pods, which are compressed, and inclose three or four roundish seeds.

This plant is easily propagated by parting of the heads; the best time for doing this is in autumn, because it shoots up to flower very early in the spring. It should have a moist soil and a shady situation.

The second sort is an annual plant, which grows naturally upon walls, and dry banks, in many parts of England, so is never cultivated in gardens. This flowers in April, and the seeds ripen in May.

The third sort grows naturally on the Alps, and other mountainous parts of Europe. This is a low perennial plant, which seldom rises more than two inches high; it has a shrubby stalk, which divides into many small heads like the first sort. The leaves are small, some of them are winged, having five short narrow lobes, placed on a midrib, others have but three. The flowers come out in clusters, fitting close to the leaves. They are of a bright purple colour, and appear early in the spring. This is a perennial plant, which may be propagated by parting of the heads in the same manner as the first, and requires the same treatment.

The fourth sort grows naturally in shady woods in many parts of Europe, and is but seldom kept in gardens, unless for the sake of variety. It is an annual plant, rising with an upright branching stalk, garnished with heart-shaped indented leaves, which embrace the stalks with their base. The stalks are terminated by loose spikes of white flowers,

which appear the beginning of May; in June the seeds ripen, and the plants soon after decay.

The fifth sort is an annual plant, which grows in shady woods in the northern parts of Europe. This is like the former sort, but the leaves are larger, rounder, and do not embrace the stalks; they are also hairy, and the flowers are yellow. If the seeds of this are permitted to scatter, the plants will maintain themselves, if they have a shady situation.

The sixth sort rises with an upright stalk about a foot high, the lower part being very closely garnished by oblong hoary leaves, which are indented on their edges. The upper part of the stalk puts out two or three short branches, which are almost naked of leaves, as is also the upper part of the stalk. The flowers come loosely out at the top of the stalk; they are composed of four small white petals placed in form of a cross, which are succeeded by oblong pods which are twisted, containing three or four roundish compressed seeds.

DRACO ARBOR. See Palma.

DRACO HERBA, or Tarragon. See Abrotanum.

DRACOCEPHALUM. Lin. Gen. Plant. 648. Dragon's Head.

The Characters are,

The flower hath one ringent petal, with large, oblong, inflated chaps. The upper lip is obtuse and arched, the under lip is trifid. It hath four stamina, two being shorter than the other, and a four-parted germen, which afterward becomes four oval oblong seeds, inclosed in the empalement.

The Species are,

1. DRACOCEPHALUM foliis lanceolatis serratis, floribus spicatis. Lin. Sp. American Dragon's Head.
2. DRACOCEPHALUM floribus spicatis, foliis compositis. Lin. Hort. Cliff. Three-leaved American Balm, having a strong smell, commonly called Balm of Gilead.
3. DRACOCEPHALUM floribus verticillatis, bracteis lanceolatis, serraturis capillaceis. Lin. Hort. Upsal. 166. Moldavian Balm, with a Betony leaf and blue flower.
4. DRACOCEPHALUM floribus verticillatis, bracteis serrato ciliatis orbiculatis. Lin. Hort. Upsal. Lesser eastern Moldavian Balm, with a Willow leaf and a bluish flower.
5. DRACOCEPHALUM floribus verticillatis, bracteis oblongis, serraturis spinosis, foliis subtomentosis. Hort. Upsal. 166. Eastern Moldavian Balm, with a Betony leaf and a large blue flower.
6. DRACOCEPHALUM floribus verticillatis, bracteis oblongis ovatis integerrimis, corollis majusculis nutantibus. Hort. Upsal. 167. Moldavian Balm with a Betony leaf, and larger blue pendulous flowers.
7. DRACOCEPHALUM floribus verticillatis, bracteis oblongis integerrimis, corollis vix calyce majoribus. Hort. Upsal. 167. Moldavian Balm, with a Betony leaf and very small blue flowers.
8. DRACOCEPHALUM floribus verticillatis foliis ovatis inciso-crenatis, bracteis lanceolatis integerrimis. Lin. Sp. Pl. 595. Dragon's Head with flowers growing in whorls, and oval leaves which are cut and crenated, and spear-shaped bractæ, which are entire.

The first sort is a native of North America. This sort rises with an upright four-cornered stalk, near three feet high, garnished with narrow spear-shaped leaves, fitting close to the stalk, sawed on their edges, and are placed opposite at each joint. The flowers grow in long spikes on the top of the stalks; they are of a purple colour. This is a perennial plant, which will live in the open air, but requires a moist soil, or should be duly watered in dry weather. It is propagated by parting the roots in autumn.

The second sort is a native of the Canary islands. It is usually called by the gardeners Balm of Gilead, from the strong resinous

resinous scent which the leaves emit on being rubbed. This is a perennial plant, which rises with several square stalks, to the height of three feet or more, becoming ligneous at their lower parts, garnished with compound leaves at each joint, which are placed opposite; they have three or five lobes, which are oblong, pointed, and sawed on their edges. The flowers terminate the stalks in short thick spikes; they are of a pale blue colour, and are succeeded by small angular seeds. This plant continues producing flowers most part of summer; it is usually kept in green-houses, but, in mild winters, the plants will live abroad, if they are planted in warm borders; and those plants which are kept in pots, will thrive much better when they are sheltered under a frame, than if placed in a green-house, where the plants are apt to draw up weak, for they should have as much free air as possible in mild weather, and only require to be sheltered from severe frost. This may be propagated by seeds, which, if sown in autumn, will more certainly grow, than those which are sown in the spring; if the seeds are sown in the full ground, it should be in a warm border. It may also be propagated by cuttings, which, if planted in a shady border any time in summer, will very soon take root, and furnish plenty of rooted plants.

The third sort is a native of *Moldavia*; it is an annual plant, which rises with branching stalks two feet high, garnished with oblong leaves, placed opposite, which are deeply sawed on their edges. The flowers come out in whorls round the stalks at every joint; they are blue, and are succeeded by seeds which ripen in *September*. The seeds should be sown in small patches in the spring, upon the borders where they are to remain, and when the plants come up, they should be thinned where they grow too near together, and kept clear from weeds, which is the only culture they require. Of this there is a variety with white flowers, which is pretty common in the gardens.

The fourth sort was discovered by *Dr. Tournefort* in the *Archipelago*. This rises with upright stalks about a foot high, which seldom put out branches; they are garnished with very long, narrow, entire leaves, placed opposite at each joint, where the flowers come out in whorls, almost the whole length of the stalks; they are of a pale blue, but as they are very small, so make no great appearance.

The fifth sort was also discovered by *Dr. Tournefort* in the *Levant*; this hath hoary square stalks, which rise a foot and an half high, putting out two or three side branches, garnished with hoary leaves, a little indented on their edges; they are placed opposite at their joints, just under the whorls of flowers, which sit close to the stalk; the flowers are larger than those of the other species, and are of a fine blue colour, which between the hoary leaves of the plant make a pretty appearance. It flowers and seeds about the same time with the former sorts. There is a variety of this with white flowers, the seeds of which generally produce the same coloured flowers.

The sixth sort grows naturally in *Siberia*. This is an annual plant, with many square weak stalks a foot long; these are at the bottom garnished with oval spear-shaped leaves, crenated on their edges. The upper part of the stalks have smaller leaves, which sit close at the joints, from whence come out the flowers in whorls, of a deep blue colour, and hang downward; these appear at the same time with the former, and the seeds ripen in autumn.

The seventh sort grows also in *Siberia*. It hath square stalks, which rise a foot and an half high; the lower leaves are very like those of *Betony*, and stand upon very long foot-stalks. The upper leaves are small, and sit closer to the stalks. The flowers come out in whorls at every joint; these are very small, and of a pale purple colour, so make little appearance.

The eighth sort grows naturally in *Siberia*. This is an annual plant, with a square stalk; sending out two or three small side branches from the lower part. The leaves are oval, and deeply crenated on their edges. The flowers are large, of a blue colour, and come out in whorls round the stalks, having two spear-shaped, entire, small leaves (called *bractea*) immediately under them. This sort flowers and seeds at the same time with the former.

All these sorts are propagated by seeds, which may be sown either in the spring or autumn, in the places where the plants are to remain, and will require no other treatment than the third sort.

DRACONTIUM. *Lin. Gen. Pl.* 916. Dragon.

The Characters are,

It hath a close cylindrical spadix, and a boat shaped sheath. The flowers have no empalement, but have five oval concave petals. They have an oval germen, which afterward becomes a roundish berry, inclosing several seeds.

The Species are,

1. DRACONTIUM *foliis pertusis, caule scandente.* *Lin. Sp. Plant.* 968. Dragon with leaves having holes, and a climbing stalk.

2. DRACONTIUM *scapo brevissimo, petiolo radicato, lacera, foliis tripartitis, laciniis pinnatifidis.* *Hort. Cliff.* 434. Many leaved Arum, with a rough purple stalk.

3. DRACONTIUM *foliis sagittatis, pedunculis petiolisque aculeatis.* *Flor. Zeyl.* 328. Dragon with arrow-pointed leaves, whose foot-stalks have spines.

4. DRACONTIUM *foliis lanceolatis.* *Amerit. Acad.* p. 360. Dragon with spear-shaped leaves.

The first sort grows naturally in most of the islands in the *West-Indies*. This hath trailing stalks, which put out roots at every joint, that fasten to the trunks of trees, walls, or any support which is near them, and thereby rise to the height of twenty-five or thirty feet. The leaves are placed alternately upon long foot-stalks; they are four or five inches long, and two and an half broad, and have several oblong holes in each, which on the first view appear as if eaten by insects, but they are natural to the leaves. The flowers are produced at the top of the stalk, which always swells to a much larger size in that part immediately under the flower, than in any other; these are covered with an oblong spatha (or hood) of a whitish green colour, which opens longitudinally on one side, and shews the pistil, which is closely covered with flowers, of a pale yellow, inclining to white. When this plant begins to flower, it seldom advances farther in height, so that these seldom are more than seven or eight feet high, but the leaves are much larger on these, than those of the plants which ramble much farther.

It is propagated easily by cuttings, which, if planted in pots filled with poor sandy earth, and plunged into a hot-bed, will soon put out roots, if they had none before, but there are few of the joints which are destitute of roots; the plants are tender, so will not live in the open air in *England*, therefore the pots should be placed near the walls in the hot-house, against which the plants will climb, and fasten their roots into the wall, and thereby support themselves. They should have but little water given them in the winter, but in warm weather it must be given them frequently; in the summer the free air should be admitted to them in plenty. The plants have no particular season of flowering, for they sometimes flower in autumn, and at other times in the spring, but they do not ripen their seeds in *England*.

The second sort grows naturally in several of the islands of *America*. This hath a large, knobbed, irregular root, covered with a rugged brown skin. The stalk rises about a foot high, is naked to the top, where it is garnished with a
tuff

tuft of leaves, which are divided into many parts. The stalk is smooth, of a purple colour, but is full of sharp protuberances of different colours, which shine like the body of a serpent. The spadix (or stalk) of the flower rises immediately from the root, and is seldom more than three inches high, having an oblong swelling hood at the top, which opens lengthways, shewing the short, thick, pointed pistil within, upon which the flowers are closely ranged.

This sort is tender, so requires a warm stove to preserve it in *England*. The roots must be planted in pots, and plunged into the tan bed in the stove, where they should constantly remain; in the winter they must be watered very sparingly, but in warm weather, when the plants are in vigour, they must be often refreshed, but it should not be given them in too great quantities.

The third sort grows naturally in the island of *Ceylon*, and in several parts of *India*; this hath an oblong thick root, full of joints, from which arise several leaves, shaped like those of the common Arum, but their foot-stalks are covered with rough protuberances. The stalk which supports the flower is short, and set with the like protuberances, and at the top is a hood, or spathe, about four inches long, which opens longitudinally, and exposes the pistil, which is set with flowers. This is a tender plant, and requires the same treatment as the former sort.

The fourth sort hath roots like the common Arum, from which come out several spear-shaped leaves, standing each upon a separate foot-stalk, arising immediately from the root, as those of the common Arum. This grows naturally in *Siberia*, so requires a shady situation, and will bear the greatest cold of this country.

These plants are preserved in the gardens of the curious in *England* and *Holland*, more for the sake of variety, than their beauty, for except the first sort, there is not any of them which makes much appearance; that, indeed, may be suffered to have a place against the wall of the stove, over which it will spread, and cover the nakedness of the wall, and the leaves remaining all the year, which are so remarkably perforated, make a singular appearance.

DRACUNCULUS PRATENSIS. See *Achillæa*.

DRAGON. See *Dracontium*.

DULCAMARA. See *Solanum*.

DURANTIA. *Lin. Gen. Plant.* 704.

The Characters are,

The flower is of the ringent kind, with one petal, which is erect and concave, and hath an empalement divided into five equal segments. It hath four short stamina, the two middle being a little shorter than the other. The germen, which is situated under the flower, afterward becomes a globular berry, having one cell inclosing four angular seeds.

The Species are,

1. DURANTIA spinosa. *Lin. Sp. Plant.* 637. Prickly *Durantia*.

2. DURANTIA inermis. *Lin. Sp. Plant.* 637. *Durantia* without thorns.

The first sort hath many trailing branches, which are armed with hooked thorns at every joint, and are garnished with oblong leaves, which are placed without order; the flowers come out from the side of the stalks in pretty long

bunches, like those of the common *Currant*; they are of a pale bluish colour, and are succeeded by brown berries not unlike those of the *Hawthorn*; these have one cell, and inclose four angular seeds.

The second sort hath a branching woolly stalk, which rises seven or eight feet high; the branches are garnished with oval spear-shaped leaves, sawed on their edges, of a lucid green colour, and stand opposite. The flowers are produced in long bunches at the end of the branches; these are blue, and are succeeded by pretty large, round, yellow berries, which contain four angular seeds.

These plants are natives of warm countries, so they require a stove to preserve them in winter. They are propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners bark; and when the plants are fit to remove, they must be planted each into a separate small pot, and plunged into a hot-bed again, observing to shade them till they have taken new root, then they must be treated in the same manner as other plants from the same country.

They may also be propagated by cuttings, which may be planted in any of the summer months; but these should be plunged into a moderate hot-bed, and shaded from the sun till they have taken root, then they may be treated in the same manner as the seedling plant.

DWARF TREES were formerly in much greater request than they are at present; for though they have some advantages to recommend them, yet the disadvantages attending them greatly over-balance; and since the introducing of *Espaliers* into the *English* gardens, Dwarf Trees have been in little esteem for the following reasons:

1. The figure of a Dwarf Tree is very often so much studied, that, in order to render the shape beautiful, little care is taken to procure fruit, which is the principal design in planting these trees.

2. The branches being spread horizontally near the surface of the ground, render it very difficult to dig or clean the ground between them.

3. Their taking up too much room in a garden (especially when they are grown to a considerable size) for nothing can be sown or planted between them.

It is also very difficult to get to the middle of these Dwarf Trees in the summer, when their leaves and fruit are on the branches, without beating off some of the fruit, and breaking the young shoots; whereas the trees on an *Espalier* can at all times be come at on each side, to tie up the new shoots, or to displace all vigorous ones, which if left on, would rob the trees of their nourishment.

Add to this, the fruit buds of many sorts of Pears and Apples are produced at the end of the former year's shoot, which must be shortened in order to keep the Dwarfs to their proper figure, so that the fruit buds are cut off, and a greater number of branches are obtained, than can be permitted to stand; so that all those sorts of fruit trees, whose branches require to be trained at full length, are very improper to train up as Dwarfs.

These evils being entirely remedied by training the trees to an *Espalier*, hath justly gained them the preference.

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EBENUS. *Lin. Gen. Nov.* Ebony.

The Characters are,

The empalement of the flower is slenderly indented and hairy; the flower is of the butterfly kind. It hath ten stamina. In the bottom is situated an oblong germen, which afterward becomes an oblong swelling pod, inclosing one kidney-shaped seed.

This is distinguished from *Trifolium* by the bractæ, which are situated between the flowers on the spikes.

We have but one Species of this genus, viz.

EBENUS. *Lin. Sp. Plant.* 764. Ebony.

This plant grows naturally in *Crete*, and in some of the islands of the *Archipelago*; it rises with a shrubby stalk three or four feet high, which put out several side branches, garnished with hoary leaves at each joint, composed of five narrow spear-shaped lobes, which join at their tails to the foot-stalk, and spread out like the fingers of a hand: the branches are terminated by thick spikes of large purple flowers, which are of the butterfly or Pea-bloom kind.

This is propagated by seeds, which should be sown in the autumn, for those which are sown in the spring often fail; they should be sown in pots, and placed under a frame in the winter, where they may be protected from frost; in the spring the plants will come up. When these have acquired strength enough to be removed, they should be each planted in a separate small pot, and shaded till they have taken new root; then they should be placed in a sheltered situation, where they may remain till autumn, when they must be removed into shelter, for these plants will not live in the open air through the winter; nor should they be too tenderly treated: I have found them succeed best when placed in an airy glass-case without fire in the winter, where they will have more sun and air, than in a greenhouse: during the winter season, the plants must be sparingly watered, but in the summer they will require to be often refreshed.

EBULUS. See *Sambucus*:

ECHINOMELOCACTUS. See *Cactus*.

ECHINOPHORA. *Lin. Gen. Pl.* 292. Prickly Parsnep.

The Characters are,

It hath an umbellated flower; the flowers have five unequal petals; they have each five stamina, terminated by roundish summits. Under the perianthium is situated an oblong germen within the empalement, which afterward turns to two seeds, which are inclosed in the empalement.

The Species are,

1. **E**CHINOPHORA *foliolis subulato-spinosis integerrimis. Lin. Sp. Plant.* 239. Prickly-headed Parsnep, with awl-shaped prickly leaves which are entire.

2. **E**CHINOPHORA *foliolis incisus inermibus. Lin. Sp. Plant.* 239. Prickly-headed Parsnep, with cut leaves without thorns.

These plants grow naturally on the borders of the *Mediterranean sea*; they are preserved in the gardens of botany, for the sake of variety: they have both perennial roots, which creep in the ground; the first have branching stalks, growing five or six inches high, which are garnished with short thick leaves, that terminate in two or three sharp

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thorns, which are placed opposite: the flowers grow in an umbel, sitting upon a naked foot-stalk, which arises from the side of the stalk; the flowers are white, and under the umbel is situated an involucre, composed of several leaves, which terminate in sharp spines.

The second sort rises near a foot and an half high; from the principal stalk are sent out two side branches at each joint, placed opposite; the lower part is garnished with leaves, which are finely divided like those of the Carrot; the flowers grow in small umbels at the extremity of the branches, having a short prickly involucre. The seeds of these plants rarely ripen in *England*.

These plants are propagated by their creeping roots in *England*; the best time to transplant them is the beginning of *March*, a little before they shoot: the roots should be planted in a gravelly or sandy soil, and in a warm situation, or otherwise they should be covered in the winter to prevent the frost from destroying them.

ECHINOPS. *Lin. Gen. Pl.* 829. Globe Thistle.

The Characters are,

The flower hath one funnel-shaped petal, included in an imbricated empalement, divided at the top into five parts; it hath five short hairy stamina, terminated by cylindrical summits. In the bottom of the tube is situated an oblong germen, which afterward becomes an oblong oval seed narrowed at the base, but obtuse and hairy at the top.

The Species are,

1. **E**CHINOPS *calyculis unifloris, caule multifloro, foliis spinosis supra nudis. Lin. Sp. Plant.* 814. Greater Globe Thistle.

2. **E**CHINOPS *calycibus unifloris, caule unicapitato. Lin. Sp. Pl.* 815. Smaller Globe Thistle.

3. **E**CHINOPS *calycibus fasciculatis unifloris, lateralibus sterilibus, foliis pinnatifidis supra strigosis. Lin. Sp. Plant.* 815. Smaller annual Globe Thistle, with a large head.

4. **E**CHINOPS *caule unicapitato, foliis spinosis, omnibus pinnatifidis villosis, radice reptatrice. Greek Globe Thistle, whose leaves are divided into narrow segments and are woolly, with a smaller blue head.*

The first is the common Globe Thistle. This grows naturally in *Italy* and *Spain*; it hath a perennial root, from which arise many stalks that grow to the height of four or five feet, garnished with long jagged leaves, which are divided into many segments almost to the midrib, the jaggs ending in spines; they are of a dark green on their upper side, but woolly on their under; the flowers are collected in globular heads, several of these grow upon each stalk; the common sort hath blue flowers, but there is a variety of it with white.

This plant is easily propagated by seeds, which, if permitted to scatter, the plants will come up in plenty, so a few of them may be transplanted to the places where they are designed to remain to flower; they require no other culture, but to keep them clean from weeds: the second year they will flower and produce seeds, and the roots will continue two or three years after.

The second sort grows in the south of *France* and in *Italy*; this hath a perennial root, which sends up several stalks, that

that rise two feet high, garnished with leaves, which are cut into many fine segments to the midrib, which are set with prickles, and are white on their under side: the stalks are each terminated by a globular head of flowers, which are smaller than those of the first, and of a deeper blue; there is also a variety of this with white flowers; this is propagated in the same way as the first.

The third sort grows naturally in *Spain* and *Portugal*: this is an annual plant, which rises with a stiff white stalk two or three feet high, garnished with divided leaves, ending in many points which have spines; their upper side is green, and covered with brown hairs, their under side white and woolly; the stalk is terminated by one large head of pale blue flowers; and if the season proves warm and dry, the seeds will ripen in autumn, but in wet cold years they rarely ripen here.

These seeds should be sown in the spring upon a border of light earth, where the plants are to remain; they require no other management, but to thin them where they are too close.

The fourth sort grows naturally in *Greece*; this hath a perennial creeping root, by which it multiplies fast enough; the stalks rise about two feet high, and are closely garnished with leaves which are shorter and much finer divided than either of the former sorts; these are hoary, and armed on every side with sharp thorns; the stalks are terminated by one globular head of flowers, which in some are blue and in others white: in warm seasons the seeds will ripen well in *England*, but it is easily propagated by its creeping roots; it loves a dry soil and a warm situation.

ECHIUM. *Lin. Gen. Plant.* 157. Viper's Buglofs.

The Characters are,

The flower hath one petal, with a short tube, and an erect broad brim, cut into five irregular parts, and hath naked chaps; it hath five awl-shaped stamina; in the bottom are situated four germen, which afterward become so many roundish pointed seeds, inclosed in the rough empalement.

The Species are,

1. ECHIUM caule simplici erecto, foliis caulinis lanceolatis hispidis, floribus spicatis lateralibus, staminibus corolla æquantibus. Common Viper's Buglofs.
2. ECHIUM caule simplici erecto, foliis caulinis lanceolato-linearibus hispidis, floribus lateralibus spicatis sessilibus, staminibus corollâ longioribus. This is the *English Lycopsis*.
3. ECHIUM corollis vix calycem excedentibus, marginè villosis. *Hort. Upsal.* 35. Great rough Viper's Buglofs, with a white flower.
4. ECHIUM foliis radicalibus lanceolatis amplissimis, caulinis linearibus hirsutis, corollis staminè longioribus. *Portugal Viper's Buglofs*, with a large leaf.
5. ECHIUM calycibus frutescentibus distantibus, caule prosumbente. *Lin. Hort. Upsal* 35. Broad-leaved Viper's Buglofs of *Candia*, with a red flower.
6. ECHIUM caule ramoso, aspero, foliis calloso verrucosis, staminibus corollâ longioribus. *Narrow-leaved Viper's Buglofs* of *Candia*, with a red flower.
7. ECHIUM caule fruticoso. *Hort. Cliff.* 43. Shrubby *African Viper's Buglofs*, with hairy leaves.

The first sort grows naturally in *Germany* and *Austria*; this and our common Viper's Buglofs, which is the second, have been confounded by most of the writers on botany, who have supposed they were the same plant, whereas they are very different; for the leaves of this are shorter, and much broader than those of the second; the spikes of flowers are much longer, and the stamina of the flowers are in this equal in length with the petal; whereas those of the second stand out much beyond it, which is an essential difference.

The second sort grows naturally upon chalky lands, in most parts of *England*: this is what *Lobel* titles *Lycopsis*

Anglica, and has been generally taken for the common Echium.

The third sort grows naturally in the south of *France*, and in *Italy*; this rises with an upright stalk, which is very hairy, as are also the leaves; the flowers are produced in short spikes on the side of the branches; they are small, and scarce appear above the empalements; some plants have white flowers, and others are purplish; the empalements of the flowers are very hairy, and cut into acute segments.

The fourth sort grows naturally in *Portugal* and *Spain*; the lower leaves of this are more than a foot long, and two inches broad in the middle, gradually lessening to both ends; these are covered with soft hairs. The stalks grow two feet high; the flowers are in short spikes coming from the side of the stalks; the petals of these are longer than the stamina.

The fifth sort grows naturally in *Crete*; this hath trailing hairy stalks, which grow about a foot long, and put out several side branches, garnished with hairy spear-shaped leaves fitting close to the stalks. The flowers come out on slender spikes upon long foot-stalks, which come from the wings of the leaves; they are large, of a reddish purple colour, which turns to a fine blue when they are dried; these stand at a distance from each other on the spike; it is an annual plant, which flowers in *July* and decays in autumn.

The sixth sort hath branching stalks, which grow a foot and a half long, declining toward the ground; they are covered with stinging hairs, which are wanted; the leaves are four inches long, and not more than half an inch broad; the flowers grow in loose spikes from the side of the stalks, and also at the end of the branches; they are of a reddish purple colour, but not so large as those of the former sort; and the stamina of these are longer than the petals: this is also an annual plant, which grows naturally in *Crete*.

These are all of them biennial plants, except the fifth and sixth sorts, which are annual, and are the most beautiful of all the kinds: the seeds of these must be sown every year in the places where they are designed to remain; and the plants require no other culture, but to keep them clean from weeds, and thin them where they grow too close. In *July* they flower, and their seeds ripen in five or six weeks after. The seeds of the other sorts being sown in the spring, will the second summer after produce flowers and seeds, after which they seldom continue; they all delight in a rubbishy gravelly soil, and will grow upon the tops of old walls or buildings, where, when once they have established themselves, they will drop their seeds, and thereby maintain a succession of plants without any care, and on these places they appear very beautiful.

The seventh sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby stalk two or three feet high, dividing upward into several branches, which are garnished with oval leaves placed alternate, whose base fits close to the stalk; they are hairy, and of a light green colour; the flowers are produced singly between the leaves, at the end of the branches; they are of a purple colour, and in shape much like those of the fifth sort.

It is propagated by seeds, which should be sown in pots soon after they are ripe, and may be exposed to the open air till the beginning of *October*, when the pots should be placed under a frame; to guard them from frost; but in mild weather they should have the free air, to prevent the seeds from vegetating till the winter is past; for if the plants come up at that season, their stems will be weak and full of juice, and very liable to rot with damps; therefore it is much better, if the plants do not come up till toward *March*, which is the usual time of their appearing, when the seeds are not forced by warmth. When the plants are fit to remove, they should be each planted into a small pot, and placed under a frame to forward their putting out new roots;

then they should be gradually inured to bear the open air, and the latter end of *May* be placed abroad in a sheltered situation, where they may remain till the beginning of *October*, at which time they must be removed into an airy glass-case, where they may enjoy the sun, and have free air in mild weather. During the winter season these plants must be sparingly watered, for as their stems are succulent, so much moisture will cause them to rot. In the summer they should be set abroad in a sheltered situation, and treated in the same manner as other plants from the same country.

EDERA QUINQUEFOLIA. See *Vitis*.

EDGINGS. The best and most durable plant for edgings in a garden, is *Box*, which, if well planted and rightly managed, will continue in beauty several years: the best season for planting this is either in the autumn, or very early in the spring; for if you plant it late, and the season should prove hot and dry, it will be very subject to miscarry, unless great care be taken to supply it with water; the best sort for this purpose is the dwarf *Dutch Box*.

EHRETIA. *Trew. Tab. 25.* Bastard Cherry tree.

The Characters are,

The flower has one bell-shaped petal, cut into six segments, which are reflexed, and six stamina, which are longer than the petal; it has a roundish germen, which afterward becomes a succulent berry with two cells, including two stones, each having two kernels.

We know but one Species of this genus, viz.

EHRETIA. This is the *Ehretia foliis alternis oblongis acuminatis, spica florum sparsa petalis reflexis albis. Trew. Tab. 25.* It is called Bastard Cherry tree in the *West-Indies*.

This has a strong woody trunk, which in the *West-Indies* grows to the size of a middling Pear tree, covered with a gray furrowed bark, divided into many branches, garnished with oblong, acute-pointed, smooth leaves, five or six inches long, and two inches and a half broad, of a dark green colour on their upper side, placed alternate, having short foot-stalks: the flowers are produced in panicles at the end of the branches; they are small, white, and of one petal, having a bell-shaped tube, but cut into six segments to the middle, which are reflexed; these are succeeded by small, oval, succulent berries, containing one or two stones; it grows in most of the islands of the *West-Indies*.

This is usually propagated by seeds, when they can be obtained, which should be sown in pots, and plunged into a hot-bed of tan; when the plants come up they may be treated in the same way as the *Malpigbia*; to which article the reader is desired to turn, to avoid repetition; it may also be increased by layers. This plant has produced its flowers several times in the *Chelsea* garden, but it has not perfected its fruit here.

The title of this genus was given to it by the learned Dr. *Trew* of *Nuremberg*, in honour of Mr. *George Denis Ehret*, a curious botanist, who sent a drawing of the plant to the Doctor, taken from one of the plants that flowered in the *Chelsea* garden, from which he has published a curious print in his twenty-fifth table.

ELÆAGNUS. *Lin. Gen. Plant. 148.* Oleaster, or wild Olive.

The Characters are,

The flower hath a bell-shaped empalement of one leaf, which is quadrifid, rough on the outside, but coloured within; it hath no petals, but four short stamina, which are inserted in the divisions of the empalement: at the bottom is situated a roundish germen, which afterward becomes an obtuse oval fruit, with a puncture at the top, inclosing one obtuse nut.

The Species are,

1. ELÆAGNUS aculeatus, foliis lanceolatis. Prickly wild Olive, with spear-shaped leaves; or, *Lafena* broad-leaved wild Olive, with a large fruit.

2. ELÆAGNUS inermis, foliis lineari-lanceolatis. Wild Olive without thorns, and narrow spear-shaped leaves.

3. ELÆAGNUS foliis ovatis. *Prod. Leyd. 250.* Wild Olive, with oval leaves.

The first and second sorts Dr. *Tournefort* found growing naturally in the *Levant*; the first I take to be the common sort, which grows naturally in *Bobemia*, of which I saw some trees growing in the curious garden of the late Dr. *Boerhaave*, near *Leyden* in *Holland*. The leaves of this sort are not more than two inches long, and about three quarters of an inch broad in the middle; they are of a silver colour, placed alternate; at the foot-stalk of every leaf there comes out a pretty long sharp thorn, which are alternately longer: the flowers are small, the inside of the empalement is yellow, and they have a strong scent when fully open.

The second sort hath no thorns on the branches, the leaves are more than three inches long, and half an inch broad, and have a shining appearance like fatten. The flowers come out at the foot-stalks of the leaves, sometimes singly, at other times two, and frequently three at the same place; the outside of the empalement is silvery and studded, the inside of a pale yellow, having a very strong scent; this flowers in *July*, and sometimes the flowers are succeeded by fruit. This is the sort which is most commonly preserved in the *English* gardens.

These plants may be propagated by laying down the young shoots in autumn, which will take root in one year, when they may be cut off from the old trees, and either transplanted into a nursery for two or three years, to be trained up, or into the places where they are to remain. The best season for transplanting of these trees is in the beginning of *March*, or early in the autumn, provided the roots are mulched, to protect them from severe frost in winter; they should be placed where they may be screened from strong winds, for they grow very freely, and are very subject to be split down by the wind, if they are too much exposed.

The third sort grows naturally in *Ceylon*, and in some other parts of *India*. This is pretty rare at present in the *English* gardens, but some years past there were several pretty large plants of it growing in the garden at *Hampton Court*: this in *England* rises with a woody stem to the height of eight or nine feet, dividing into many crooked branches, garnished with oval silvery leaves, which have several irregular spots of a dark colour on their surface; they are placed alternately on the branches, and continue all the year. The flowers I have not seen, though some of the trees at *Hampton Court* produced flowers, but I was not so lucky as to see them.

This sort requires a warm stove to preserve it in this country, for it is too tender to live in the open air, excepting for a short time in the warmest part of summer.

ELATERIUM. See *Momordica*.

ELATINE. See *Linaria*.

ELECAMPANE. See *Inula*.

ELEPHANTOPUS. *Lin. Gen. Plant. 827.* Elephant's Foot.

The Characters are,

The flowers are collected in one common involucre, each contains four or five florets, which are tubulous, and divided into five equal parts; they have five very short hairy stamina; in the bottom is situated an oval germen, which afterward becomes a single compressed seed crowned with bristles, and sitting on a naked placenta.

The Species are,

1. ELEPHANTOPUS foliis oblongis scabris. *Hort. Cliff. 390.* Elephantopus with oblong rough leaves.

2. ELEPHANTOPUS foliis ovatis tomentosiss. *Gron. Virg. 90.* Elephantopus with oval woolly leaves.

The first sort grows naturally in both the *Indies*; this sends out many oblong rough leaves, which spread near the ground; between these, in the spring, arises a branching stalk little more than a foot high; the side branches are short, and are generally terminated by two heads of flowers, each standing upon a short foot-stalk; the heads contain a great number of hermaphrodite florets, included in a common involucre, composed of four oval leaves, ending in acute points; the florets are of a pale purple colour, but it rarely produces seeds in *England*.

The second sort grows naturally in *South Carolina*; the plants of this have frequently come up in the earth, which has been sent from thence with other plants; this hath several oval woolly leaves growing from the root, which have many transverse nerves, running from the midrib to the sides; they spread flat on the ground, and between these arise a stiff stalk about a foot high, which divides into many branches, each being terminated by two flowers, which are composed of several florets, inclosed in a four-leaved involucre; two of these leaves are alternately larger than the other: the involucre is longer than the florets, so they do but just appear within the two larger leaves; the flowers make no appearance; they appear in *July*, but the seeds never ripen in this country.

The first sort hath a perennial root, but an annual stalk. If this is planted in pots, and sheltered in the winter from frost, it may be preserved several years, and the plants will annually flower; but the second sort seldom continues longer than two years.

They are propagated by seeds, which should be sown on a hot-bed in the spring; and when the plants are come up, they must be transplanted into pots, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root; then they should have a large share of fresh air in warm weather, and must be frequently refreshed with water.

ELICHRYSUM. See Gnaphalium.

ELLISIA. *Brown. Hist. Jam.* 262.

The Characters are,

The flower has a small cylindrical empalement of one leaf, indented in five parts at the brim; it has one tubulous petal, whose brim is cut into five segments, which spread open; it has four stamina, two of which are longer than the other, and a roundish germen, which becomes a roundish berry crowned by the empalement, inclosing eight nuts, which have two cells, with one angular seed in each.

We have but one Species of this genus, viz.

ELLISIA.

This grows naturally in *Jamaica*, and some of the other islands in the *West-Indies*; it has a shrubby stalk, which divides into many slender, angular, ligneous branches, garnished with oval leaves which stand opposite; some of which are obtuse, and others end in acute points; they are sawed on their edges toward the top, and are of a light green colour when they are in the stove; but in summer, when they are exposed to the open air, they change black, and continue so till after they have been some time in the stove again. The flowers (according to *Dr. Brown's* figure) are disposed in loose spikes, which come out from the wings, and also at the end of the branches; they are white and of the ringent kind: the branches are armed at each joint with two slender erect thorns, which are situated opposite immediately above the leaves, and are unequal, one being longer than the other.

This plant is propagated by cuttings, which put out roots with great facility in any of the summer months; if they are planted in pots, and plunged into a moderate hot-bed of tan, and shaded from the sun, they will soon take root; when they begin to shoot they should have free air

admitted to them, and gradually hardened; then they should be carefully separated, and each planted in a small pot, placing them under cover till they have taken new root; when they may be removed into a warm sheltered situation, where they may remain till autumn; then they must be removed into a stove, and during the winter season should have a temperate heat, in which they will thrive best; for when they are too tenderly treated, their shoots are weak, and subject to be attacked by vermin, nor will the plants live through the winter in a green-house. In summer, they should be placed in the open air in a warm sheltered situation; with this management the plants have succeeded best.

ELM. See Ulmus.

EMERUS. *Tourn. Inst. R. H.* 650. Scorpion Sena, vulgò.

The Characters are,

The flower hath an empalement of one leaf, divided into five parts; the flower is of the butterfly kind; the standard is narrow, and shorter than the wings, over which it is arched; the wings are large and concave; the keel is heart-shaped and reflexed; it hath ten stamina: in the empalement is situated an oblong slender germen, which afterwards becomes a taper cylindrical pod, swelling in those parts where the seeds are lodged.

The Species are,

1. EMERUS caule fruticoso, pedunculis longioribus. Scorpion Sena with a shrubby stalk, and longer foot-stalks to the flowers.

2. EMERUS foliolis obcordatis, pedunculis brevioribus, caule fruticoso. Scorpion Sena with long heart-shaped leaves, shorter foot-stalks to the flowers, and a shrubby stalk.

3. EMERUS caule erecto, herbaceo, foliolis multijugatis, floribus singularibus, siliquis longissimis erectis. Scorpion Sena with an erect herbaceous stalk, the leaves composed of many pair of lobes, single flowers proceeding from the sides of the stalks, and very long erect pods.

The first of these shrubs is very common in all the nurseries near *London*; this rises with weak shrubby stalks to the height of eight or nine feet, dividing into many slender branches, garnished with winged leaves, composed of three pair of lobes, terminated by an odd one. The flowers come out upon long foot-stalks from the side of the branches, two or three of these foot-stalks arising from the same point, each sustaining two, three, or four yellow butterfly flowers, which are succeeded by long slender pods, swelling in those parts where the seeds are lodged; these shrubs continue long in flower, especially in cool seasons, and frequently flower again in autumn, which renders them valuable.

The second sort rises with many shrubby stalks like the first, but not more than half the height; this hath larger leaves, which are of an oblong heart-shape. The flowers are rather larger than those of the first, and stand upon shorter foot-stalks; these differences hold in the plants which are raised from seeds, therefore I think they may be allowed to stand as distinct species, though there is a great likeness at first sight in them.

These shrubs are easily propagated by laying down their tender branches, which will take root in one year, and may then be transplanted into a nursery, and managed in the same manner as other flowering shrubs.

The third sort grows naturally in the *West-Indies*, where *Plumier* first discovered it in the *French* settlements, but has since been found growing in plenty at *La Vera Cruz*, in *New Spain*, by the late *Dr. Houssoun*. This plant is annual, it rises with a round herbaceous stalk three feet high, garnished at each joint with one long winged leaf, composed of about twenty pair of lobes, terminated by an odd one; the flowers come out singly from the side of the stalk, immediately above the foot-stalks of the leaves, standing upon slender foot-stalks; they are larger than those of either of

the former sorts, and are of a pale yellow colour; these are succeeded by slender compressed pods, which are more than six inches long, having a border on each side, and swelling where each seed is lodged.

The seeds of this plant must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted into a separate small pot, and plunged into a moderate hot-bed of tanners bark, shading them from the sun until they have taken new root, then they must be treated in the same manner as other exotick plants from those warm countries. If the plants are brought forward in the spring, and kept under a deep frame in a tan-bed, or plunged into the bark-bed in the stove, when they are grown too tall to remain under common frames, they will ripen seeds in *England*, for those seeds which I received did not arrive here till *May*, and yet those plants flowered well in *August*; but the autumn proving cold, prevented their perfecting seeds, and those seeds which I reserved till the next year did not grow.

EMPETRUM. *Lin. Gen. Plant.* 977. Black-berried Heath.

The Characters are,

It hath male and female flowers on different plants; the male flowers have a three-pointed empalement, and three petals, which are narrow at their base, and three long hanging stamina; the female flowers have the same empalement and petals as the male; in the center is situated a depressed germen, with nine reflexed spreading stigmas; the germen afterward becomes a depressed round berry of one cell, inclosing nine seeds placed circularly.

We have but one Species of this genus in *England*, viz.

EMPETRUM procumbens. *Hort. Cliff.* 470. Trailing Berry-bearing Heath, Crow Berries, or Crake Berries.

This little shrub grows wild upon the mountains of *Staffordshire*, *Derbyshire*, and *Yorkshire*, and is seldom propagated in gardens, unless for variety sake; the plants should be procured from the places where they grow naturally, for the seeds remain a year in the ground before they vegetate, and afterward are very slow in their growth, so they are not worth the trouble of cultivating from seeds. If the plants are planted on a moist boggy soil in autumn, they will get roots in the winter, and will require no farther care than to clear them from weeds: as these low shrubs commonly grow upon the tops of wild mountains, where the soil is generally peaty and full of bogs, so the heath cocks feed much upon the berries of this plant; and wherever there is a plenty of these low shrubs, there are commonly many of these fowls to be found.

ENULA CAMPANA. See *Inula*.

EPHEDRA. *Lin. Gen. Plant.* 1007. Shrubby Horse Tail, *vulgò*.

The Characters are,

It hath male and female flowers in different plants; the male flowers are collected in scaly katkins, under each scale is a single flower; they have no petal, but seven stamina, which are joined in form of a column. The female flowers have a perianthium, composed of five series of leaves, which alternately lie over the divisions of the lower range; they have no petals, but two oval germen, which afterward turn to oval berries, each having two seeds.

We have but one Species of this genus in *England*, viz.

EPHEDRA pedunculis oppositis, amentis geminis. *Hort. Cliff.* 465. Shrubby Horse Tail, with opposite foot-stalks and twin katkins.

This is a low shrubby plant, which grows naturally upon the rocks by the sea in the south of *France*, in *Spain*, and *Italy*; it is also preserved in several gardens for the sake of variety, but has little beauty. This hath a low shrubby stalk, which puts out a few short branches, rising about two feet high, which have many protuberant joints, at

which come out several narrow rushy leaves, like those of the Horse Tail, which continue green all the year, but the plants rarely flower in this country.

It may be propagated by offsets, which the plants send forth in plenty, for the roots creep under ground, and put up suckers, which may be taken off to transplant in the spring; they love a pretty moist strong soil, and will endure the cold of our ordinary winters very well in the open air. Some of these plants were formerly preserved in pots, and were housed in winter; but by later experience, they are found to thrive better in the full ground.

EPHEMERUM, See *Tradescantia*.

EPIGÆA. *Lin. Gen. Plant.* 486. Trailing Arbutus.

The Characters are,

The flower hath a double empalement, the outer is composed of three, and the inner of one leaf, divided into five parts; the flower is of the salver shape; it hath ten slender stamina the length of the tube. In the center is situated a globular germen, which afterward becomes a depressed five-cornered fruit, with five cells, containing several seeds.

We know but one Species of this genus, viz.

EPIGÆA. *Lin. Gen. Plant.* 486. Trailing Arbutus.

This plant grows naturally in *North America*; it is a low plant, with a trailing shrubby stalk, which puts out roots at the joints, and when in a proper soil and situation multiplies very fast; the stalks are garnished with oblong rough leaves, which are waved on their edges; the flowers are produced at the end of the branches in loose bunches; these are white, and divided at the top into five acute segments, which spread open in form of a star.

The plants are easily propagated by their trailing stalks, which put out roots at the joints, so may be cut off from the old plant, and placed in a shady situation, and a moist soil; the best time for this is in autumn, that the plants may be well rooted before the spring. If the winter should prove severe, it will be proper to lay a few dried leaves, or some such light covering over them, which will prevent their being injured by frost; and after they are well rooted, they will require no other care but to keep them clean from weeds.

EPILOBIUM. *Lin. Gen. Plant.* 426. Willow Herb, or French Willow.

The Characters are,

The empalement of the flower is four-pointed; the flower hath four petals, and eight stamina, which are alternately shorter; under the flower is situated a long cylindrical germen, which afterward becomes a cylindrical furrowed capsule, with five cells filled with oblong seeds, crowned with down.

The Species are,

1. EPILOBIUM foliis lanceolatis integerrimis. *Lin. Hort. Cliff.* 157. Common broad-leaved Willow Herb, or French Willow.

2. EPILOBIUM foliis oppositis lanceolatis serratis. *Lin. Hort. Cliff.* 145. Hoary Willow Herb, with a large flower, commonly called Codlins and Cream.

There are several other species of this genus, some of which grow naturally in shady woods and moist places in most parts of *England*, where they are often very troublesome weeds, therefore are seldom admitted into gardens, so I shall not trouble the reader with their distinctions.

The first sort here mentioned, was formerly planted in gardens for the beauty of its flowers; but as it usually spreads far by the creeping roots, whereby it over-runs all the neighbouring plants, it has been cast out of most gardens; but it deserves to have room in some low moist places, or in great shade, where it will make a good appearance when it is in flower, and these flowers are very proper to cut for basons to adorn chimnies in the summer season. This usually grows about four feet high, with slender stiff branches,

which are beset with leaves, resembling those of the Willow, from whence it had the name of Willow Herb, or French Willow. On the upper part of the stalks the flowers are produced in long spikes, which are of a fine Peach colour; and, if the season is not very hot, they will continue near a month in beauty: this sort is found wild in divers parts of England; it is a great creeper at the root, so may be easily propagated.

There is a variety of this with white flowers, which is planted in gardens, but differs from it only in the colour of the flower; however, some persons are fond of propagating these varieties, for which reason I mentioned it here.

The second sort is found wild by the side of ditches and rivers in many parts of England; this plant grows about three feet high, and produces its flowers on the top of the stalks, but these are much less beautiful than those of the first; and the plant, being a great Rambler at the root, is never admitted into gardens. The leaves of this plant being rubbed, emit a scent like scalded apples, from whence some have given the name of Codlins and Cream to this plant.

EPIMEDIUM. *Lin. Gen. Plant.* 138. Barrenwort.

The Characters are,

The flower hath a three-leaved empalement, which falls off; it hath four obtuse petals, and four nectariums, which are cup-shaped, and as large as the petals, with four stamina, and an oblong germen, which afterward becomes an oblong pod with one cell, inclosing many oblong seeds.

This plant hath a creeping root, from which arise many stalks about nine inches high, divided at the top into three, each of which is again divided into three smaller; upon each of these stands a stiff heart-shaped leaf, ending in a point, of a pale green on the upper side, but gray on the under. A little below the first division of the stalk comes out the foot-stalk of the flower, which is near six inches long, dividing into smaller, each of these sustaining three flowers; these are composed of four leaves, placed in form of a cross; they are of a reddish colour, with yellow stripes on the border. In the center of the flower arises the style, situated upon the germen, which afterward turns to a slender pod, containing many oblong seeds, which seldom ripen with us. The roots, if planted in a good border, should be every year reduced, so as to keep them within bounds, otherwise it will spread its roots and interfere with the neighbouring plants.

EQUISETUM. Horse Tail.

There are several species of this plant, which are found in England on the sides of ditches, or in shady woods; but as they are plants which are never cultivated in gardens, I shall pass them over.

ERANTHEMUM. See Adonis.

ERICA. *Lin. Gen. Plant.* 435. Heath.

The Characters are,

The flower hath a coloured empalement of four leaves, and one swelling petal, which is quadrisid, with eight stamina fixed to the receptacle; in the bottom is situated the germen, which afterward becomes a round capsule, having four cells, which are filled with small seeds.

The Species are,

1. ERICA *antheris bicornibus inclusis, corollis inaequalibus, campanulatis mediocribus foliis oppositis sagittatis. Lin. Sp. Plant.* 352. Common smooth Heath.

2. ERICA *antheris bifidis simplicibus exsertis, corollis campanulatis longioribus, foliis quinis linearibus patentibus. Lin. Sp. Plant.* 355. Pine-leaved Heath with many flowers.

3. ERICA *antheris bicornibus inclusis, corollis ovatis racemosis, foliis ternis glabris linearibus. Lin. Sp. Plant.* 352. Dwarf Heath, with an ash-coloured bark, and Strawberry tree flower.

4. ERICA *antheris simplicibus inclusis, corollis ovatis irregu-*

laribus, floribus terno racemosis, foliis ternis ciliatis. Laest. Epist. 2. p. 9. *Lin. Sp. Plant.* 354. Heath with single sommits, oval irregular petals, triple branching flowers, and hairy leaves placed by threes.

5. ERICA *antheris bifidis exsertis, corollis globosis mediocribus, pedunculis triphyllis foliis quaternis, Lin. Sp.* 355. Shrubby African Heath.

The four first sorts grow wild upon barren uncultivated places, in divers parts of England; but notwithstanding their commonness, yet they deserve a place in small-quarters of humble flowering shrubs, where, by the beauty and long continuance of their flowers, together with the diversity of their leaves, they make an agreeable variety.

These are seldom propagated in gardens, and so not to be had from the nurseries, but may be taken up, with a ball of earth to their roots, from the natural places of their growth in autumn, and may be transplanted into the garden. The soil where they are planted should not be dunged, nor should they have any other culture than clearing them from weeds; for the less the ground is dug, the better these will thrive.

The fifth sort grows naturally at the Cape of Good Hope, and in Portugal: it hath a shrubby stalk, which rises four or five feet high, spreading into many branches, garnished with narrow smooth leaves: the flowers come out at the end of the shoots, they are of a bright purple colour, but are not succeeded by seeds in England.

This sort is preserved in some curious gardens, but is difficult to increase; it requires protection from hard frost, but in mild winters will live abroad in a warm situation.

ERICA BACCIFERA. See Empetrum.

ERIGERON. *Lin. Gen. Plant.* 855. Groundsel.

The Characters are,

It hath a compound flower, composed of many hermaphrodite florets, which form the disk, and female-half florets, which make the rays, contained in one oblong scaly empalement. The hermaphrodite florets are funnel-shaped, and have few stamina, and a small germen crowned with down, which afterward becomes a small oblong seed, crowned with long down, sitting on a naked receptacle.

The Species are,

1. ERIGERON *pedunculus unifloris lateralibus, calycibus squarrosis. Hort. Upsal.* 258. Male Fleabane of Theophrastus, and greater Fleabane of Dioscorides.

2. ERIGERON *pedunculis alternis, unifloris. Hort. Cliff.* 407. Blue acid Fleabane.

3. ERIGERON *foliis basi revolutis. Lin. Sp. Plant.* 863. Purplish Groundsel of Buenos Ayres; with under leaves like Hartshorn Plantain.

4. ERIGERON *caule floribusque paniculatis. Hort. Cliff.* 407. Annual Virginia Golden Rod.

5. ERIGERON *caule subbifloro, calyce subhirsuto. Lin. Sp. Plant.* 864. Blue Alpine Fleabane.

The first sort grows naturally in the south of France, and in Italy; it hath a perennial root, from which arise several upright stalks near three feet high, garnished with oblong, oval, hairy leaves, sitting close to the stalk; they are placed alternate; these in warm weather sweat out a clammy juice; the flowers are produced single upon pretty long foot-stalks, some arising from the side of the stalk, and others terminate it; they are yellow, and have an agreeable odour; they flower in July, and the seeds ripen in autumn.

This plant is propagated by seeds, which, if sown in autumn, will more certainly succeed, than those which are sown in the spring; it delights in a dry soil, and a sunny exposure. The second year the plants will flower and perfect their seeds, but the roots will continue some years, and annually produce their flowers and seeds.

The other four sorts are preserved in botanick gardens for the sake of variety, but are seldom admitted into gardens for pleasure. The fifth sort is a perennial plant, which grows naturally on the Alps, and may be propagated by seeds in the same manner as the first sort, but should have a shady situation and a moist soil.

The others are annual plants, which, if once admitted into a garden, and suffered to scatter their seeds, will become very troublesome weeds there.

ERINUS. *Lin. Gen. Plant.* 689.

The Characters are,

The flower hath a five-leaved empalement, and one tubulous petal, which is of the ringent kind, cut into five equal segments, is short and reflexed; it hath four stamina situated within the tube, two of which are a little longer than the other; in the bottom of the tube is situated the oval germen, which afterward becomes an oval capsule, with two cells filled with small seeds.

The Species are,

1. ERINUS *floribus racemosis*. *Lin. Sp. Plant.* 630. Erinus with branching flowers.

2. ERINUS *tomentosus, caulibus procumbentibus, floribus sessilibus axillaribus*. Woolly Erinus with trailing stalks, and flowers sitting close to their sides.

The first sort grows naturally upon the Alps and Helvetian mountains; it is a very low plant, whose leaves lie close to the ground, growing in close tufts; they are about half an inch long, and one eighth of an inch broad, sawed on their edges; between these arise the flower-stalk, which is scarce two inches high, supporting a loose bunch of purple flowers, which stand erect.

It is propagated by parting of the roots, the best time for this is in autumn; it must have a shady situation, and a loamy soil without dung, for in rich earth these plants are very subject to rot.

The second sort was sent me by the late Dr. Housloun, from La Vera Cruz, where he found it growing naturally; this sends out several trailing stalks about six inches long, which are closely garnished with small oval leaves placed on every side; they are very white and woolly, and at the joints, just above the leaves, come out the flowers, sitting very close to the stalks; they are white, and are succeeded by round capsules, having two cells filled with small seeds; this plant has great resemblance at a distance to the sea Cudweed.

The second sort is annual, so is propagated by seeds, which should be sown in pots and plunged into a moderate hot-bed, where sometimes the plants will come up in five or six weeks, and at other times the seeds do not vegetate till the following spring; this happens frequently, when the seeds have been kept long after they were gathered. When the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a hot-bed of tanners bark; when they have taken new root, they should be treated in the same way as other plants from warm countries, by admitting proper air to them at all times when the weather is warm, and frequently refreshing them with water; if the plants are brought forward early in the spring, they will perfect seeds, otherwise the winter will come on before the seeds ripen.

ERIOCEPHALUS. *Dill. Hort. Elth.* 110. *Lin. Gen. Plant.* 890.

The Characters are,

It hath a radiated flower, composed of female half florets, which form the rays, and hermaphrodite florets which form the disk; the hermaphrodite flowers are funnel shaped, and cut into five parts at the brim, and have five stamina, with a naked germen; the female florets have their petals stretched out on one side like a tongue, divided at the end into three small lobes; they have no stamina, but an oval naked germen; these have one naked seed, sitting on the naked plain receptacle.

We have but one Species of this genus, viz:

ERIOCEPHALUS. *Lin. Sp. Plant.* 926. We have no proper title for this in *English*.

This plant hath a shrubby stalk, which rises from six to eight feet high, putting out many side branches, closely garnished with hairy leaves, which come out in clusters, and are divided into three or five parts, which spread open like a hand; they have a strong smell when bruised, approaching to that of the Lavender Cotton, but not quite so rank; the flowers are produced in small clusters at the extremity of the branches, standing erect, and are tubulous; the female florets which compose the rays form a hollow, in the middle of which the hermaphrodite flowers are situated which form the disk; but the plants seldom flower in this country.

It is propagated by cuttings, which may be planted any time from May to the middle of August, that there may be time for them to get good root before the winter; they should be shaded from the sun till they have taken root; then they should be removed into the open air, and placed in a sheltered situation, where they may remain till October, when they must be removed into shelter, where they may be secured from frost: in the summer, when the plants are placed in the open air, they will require to be frequently refreshed with water in hot weather.

These plants retain their leaves all the year, so they add to the variety of exoticks in the winter season.

ERUCA. *Tourn. Inst. R. H.* 226. *tab.* 111. Rocket.

The Characters are,

The flower has a four-leaved empalement; it hath four oblong petals, placed in form of a cross; it hath six stamina, four of which are a little longer than the empalement, the other two are shorter; it hath an oblong taper germen, which afterward becomes a taper cornered pod with two cells, filled with roundish seeds.

The Species are,

1. ERUCA *foliis pinnato-laciniatis, laciniis exterioribus majoribus*. Greater Garden annual Rocket, with a white striped flower.

2. ERUCA *foliis lanceolatis, pinnato-dentatis, caule nudo simplici*. Rocket with a Daisy leaf.

3. ERUCA *foliis pinnatis glabris, caule ramoso, floribus terminalibus*. Narrow-leaved perennial Rocket, with a yellow flower.

4. ERUCA *foliis dentato-pinnatifidis hirsutis, caule hispido, siliquis laevibus*. Greater wild Saffron-coloured Rocket, with a rough stalk.

5. ERUCA *foliis pinnatis, foliolis lanceolatis pinnatifidis*. *Prod. Leyd.* 342. Rocket with a Tansy leaf.

6. ERUCA *foliis sinuato-pinnatis, sessilibus, caule ramoso*. Sicilian Rocket with a Shepherd's Purse leaf.

The first sort is an annual plant, which was formerly much cultivated in the gardens as a salad herb, but at present is little known by the gardeners, for it has been long rejected on the account of its strong ungrateful smell. It stands in the list of medicinal plants, but is seldom used, though it is reckoned a provocative and a good diuretick: when it is propagated for salads the seeds should be sown in drills, in the same manner as is practised for other small salad herbs; for it must be eaten young, otherwise it will be too strong for most palates. The winter and spring seasons are the times when this herb is usually eaten, for when it is sown in the summer the plants soon run up to seed, and are then too rank for use.

The second sort grows naturally in the south of France and Italy, where it is often eaten as a salad herb; this hath many spear-shaped leaves arising from the root; the stalks are single, naked, and rise about a foot high; the flowers grow in loose bunches on the top of the stalks, which are succeeded by pods having two cells, filled with small round seeds; this is an annual plant, which may be propagated by seeds in the same manner as the former.

The third sort grows naturally about *Paris*, and in many other parts of *Europe*; the leaves of this are narrow, and regularly divided in form of a winged leaf; the stalks branch out upward, and are terminated by loose spikes of yellow flowers. This hath a perennial root and an annual stalk.

The fourth sort grows naturally upon old walls and buildings in many parts of *England*, where it continues flowering all the summer, but is rarely admitted into gardens. It is sometimes used in medicine, for which reason I have here mentioned it.

The fifth sort grows naturally about *Turin*. This hath fine divided leaves, somewhat like those of *Tansy*, but are of a hoary green colour; the stalks rise a foot and an half high, garnished with leaves of the same form, but gradually diminish in their size upward; the flowers are produced in clusters at the top of the stalks, they are small, and of a pale yellow colour, and are succeeded by slender taper pods, which contain two rows of small round seeds.

The sixth sort grows naturally in *Italy* and *Spain*; it is an annual plant, with many oblong leaves, which are smooth, and regularly sinuated on their sides, in form of a winged leaf, of a light green, having a hot biting taste; the stalks rise a foot high, they are strong, and divide into several branches, garnished with a single leaf at each joint, shaped like those below, but smaller. The flowers are produced in loose clusters at the end of the branches; they are white, and near as large as those of the *Garden Rocket*, and are succeeded by taper pods, containing two rows of round seeds.

These plants are preserved in botanick gardens for the sake of variety, so are here mentioned; that those who are inclined to cultivate them as such, may do it by sowing their seeds in an open situation. When the plants come up, they will require no other culture but to thin them, and keep them clear from weeds. They flower in *June* and *July*, and their seeds ripen in *August*.

ERUCAGO. See *Bunias*.

ERVUM. *Lin. Gen. Pl.* 784. Bitter Vetch.

The Characters are,

The flower is of the butterfly kind, having a large roundish plain standard, two obtuse wings half the length of the standard, and a shorter keel which is pointed; with ten stamina, nine joined, and one standing separate, terminated by single summits; and an oblong germen, which afterward becomes an oblong taper pod, jointed between each seed.

The Species are,

1. ERVUM *germinibus undato plicatis*. *Hort. Upsal.* 224. The true Bitter Vetch.

2. ERVUM *seminibus compressis convexis*. *Lin. Sp. Pl.* 738. Common Lentils.

3. ERVUM *pedunculis unifloris*. *Lin. Sp. Plant.* 738. Lentil with one flower upon each foot-stalk.

4. ERVUM *pedunculis subbifloris, seminibus globosis quaternis*. *Flor. Suec.* 606. Corn Vetch with single smooth pods.

5. ERVUM *pedunculis multifloris, seminibus globosis binis*. *Lin. Sp. Pl.* 738. Corn Vetch having many hairy pods.

The first sort grows naturally in *Italy* and *Spain*: it is an annual plant, which rises with angular weak stalks a foot and an half high, garnished at each joint with one winged leaf, composed of fourteen or fifteen pair of lobes, very like those of the *Vetch*, but narrower; the flowers come out from the side of the stalks on foot-stalks, each sustaining two pale coloured flowers, which are succeeded by short pods a little compressed, containing three or four round seeds; the pods swell at the place where each seed is lodged, so that it is called a jointed pod by many.

The second sort is the common *Lentil*, which is cultivated in many parts of *England*, either as fodder for cattle,

or for the seeds, which are frequently used for meagre soups. This is also an annual plant. It rises with weak stalks a foot and an half high, garnished with winged leaves at each joint, composed of several pair of narrow lobes, terminated by a tendril or clasper, which fastens to any neighbouring plant, and is thereby supported; the flowers come out three or four together upon short foot-stalks from the side of the branches; they are small, of a pale purple colour, and are succeeded by short flat pods, containing two or three seeds, which are flat, round, and a little convex in the middle. The seeds of this plant are commonly sown in *March*, where the land is dry, but in moist ground, the best time is in *April*. The usual quantity of seed allowed to an acre of land, is from one bushel and an half to two bushels. If these are sown in drills in the same manner as *Peas*, they will succeed better than when they are sown in broad cast: the drills should be a foot and an half asunder, to allow room for the *Dutch* hoe to clean the ground between them; for if the weeds are permitted to grow among them, they will get above the *Lentils* and starve them.

There is another sort of *Lentil* which has been cultivated of late years in *England*, by the title of *French Lentil*. This is the *Lens major* of *Caspar Baubin*, and is undoubtedly a different species from the common, being twice the size, both in plant and seed, and constantly produces the same from seeds, though they do not differ much in their characters, but this is much better worth cultivating than the other. This pulse is frequently called *Tills* in many parts of *England*.

The third sort is very like the common *Lentil*, but differs from it, in having but one flower on each foot-stalk, whereas the other has three or four, but in other respects is the same, so may be cultivated in the same manner.

The fourth and fifth sorts are small annual *Vetches*, which grow naturally among the *Wheat* and *Rye* in many parts of *England*, so are not admitted into gardens; they are only mentioned here as weeds, which may be easily rooted out of the fields, if they are cut up when they begin to flower, and not permitted to ripen their seeds; for as they have annual roots, so if they do not scatter their seeds, they may be soon destroyed.

ERVUM ORIENTALE. See *Sophora*.

ERYNGIUM. *Lin. Gen. Plant.* 287. Sea Holly, or *Eryngo*.

The Characters are,

It hath many small flowers sitting upon one common conical receptacle; the flowers have a five-leaved erect empalement sitting upon the germen, and form a roundish general umbel, which is uniform; each flower has five oblong petals, and five stamina, standing above the flowers. Under the empalement is situated a prickly germen, which afterward becomes an oval fruit divided in two parts, each having one oblong taper seed.

The Species are,

1. ERYNGIUM *foliis radicalibus subrotundis plicatis spinosis, capitulis pedunculatis*. *Hort. Cliff.* 87. Common Sea Holly, or *Eryngo*.

2. ERYNGIUM *foliis radicalibus pinnatis tripartitis*. *Hort. Cliff.* 87. Common wild *Eryngo*.

3. ERYNGIUM *foliis radicalibus ovalibus planis crenatis, capitulis pedunculatis*. *Hort. Cliff.* 87. Broad-leaved plain *Eryngo*.

4. ERYNGIUM *foliis radicalibus digitato-multifidis*. *Lin. Sp. Pl.* 233. Purple, Violet-coloured, Mountain *Eryngo*.

5. ERYNGIUM *foliis radicalibus rotundato-multifidis, capitulis pedunculatis*. Alpine *Eryngo*, with a large pale-coloured head.

6. ERYNGIUM *foliis radicalibus pinnatis, serratis spinosis, foliolis trifidis*. Oriental *Eryngo* with trifid leaves.

7. *ERYNGIUM foliis gladiatis serrato-spinosis, floralibus indivisis. Lin. Sp. Plant. 232.* American Sea Holly with leaves like the Aloe, lightly sawed, commonly called Rattlesnake Weed in America.

8. *ERYNGIUM foliis radicalibus oblongis incis, caule dichotomo, capitulis sessilibus. Hort. Cliff. 87.* Lesser plain Eryngo.

9. *ERYNGIUM foliis radicalibus cordatis oblongis, caulibus pinnatifidis, capitulo subcylindrico. Lin. Sp. Pl. 233.* Blue Alpine Eryngo, with heads like the Teasel.

10. *ERYNGIUM foliis gladiatis serrato-spinosis, floralibus multifidis. Lin. Sp. Pl. 232.* Stinking Eryngo, having narrow sawed leaves, commonly called Feverweed.

The first of these species grows in great plenty on the gravelly shores in divers parts of *England*, the roots of which are candied, and sent to *London* for medicinal use, and is the true Eryngo. This hath creeping roots, which spread far in the ground; the leaves are roundish, stiff, and of a gray colour, set with sharp spines on the edges. The stalks rise a foot high; they are smooth, garnished at each joint with leaves of the same form as the lower, but smaller, and embrace the stalks with their base; at the end of the branches, come out the flowers in roundish prickly heads; under each is situated a range of narrow, stiff, prickly leaves, spreading like the rays of a star; the flowers are of a pale blue colour.

This sort will grow in a garden, if the roots are planted in a gravelly soil, and produce their flowers annually; but the roots will not grow near so large and fleshy, as those which grow on the sea shore, where they are flowed by every tide with salt water. The best time to transplant the roots is in autumn, when their leaves decay; the young roots are much better to remove than the old. If they are kept clean from weeds, it is all the culture they will require.

The second sort grows naturally in several parts of *England*, where it is a very troublesome weed; for the roots spread greatly in the ground, so are not easily destroyed by the plough, therefore it is not admitted into gardens.

The third sort makes a very pretty appearance when it is in flower, especially that with blue stalks and flowers, for there is a variety of this with white flowers and stalks, though not so common. As this doth not spread at the root, but keeps within bounds, so it deserves a place in the pleasure-garden. It is propagated by seeds, which, if sown in the autumn, will more certainly succeed, than when it is sown in the spring, for the latter commonly remains in the ground a year before they vegetate; and if the seeds are sown where the plants are to remain, they will flower stronger than those which are transplanted; for as they have long downright roots, so they are frequently broken in taking out of the ground, which greatly weakens the plants. The culture they require is to thin them where they are too near, keep them clean from weeds, and dig the ground about them every spring before they shoot.

The fourth sort grows naturally upon the mountains of *Syria*, and also upon the *Apennines*. The lower leaves of this sort are divided like the fingers of a hand, into five or six segments, which are very much cut at their extremities, and have small spines; the stalk rises about two feet high, garnished with smaller and more divided leaves; the upper part of the stalk, and also the heads of flowers, are of the finest amethyst colour, so that they make a very fine appearance. This is propagated by seeds, in the same manner as the former sort.

The bottom leaves of the fifth sort are very much divided, and the extremity of the segments form an oval or circle, ending in spines; they are of a whitish gray in the middle, and green on the borders. The stalks rise about

two feet high, garnished at the joints with smaller leaves which are finely cut: the flowers terminate the stalk, they are of a light blue colour, and grow in larger heads than either of the former sorts. This grows naturally on the *Alps*; it is a perennial plant, and may be propagated by seeds in the same manner as the former.

The sixth sort was discovered by Dr. *Tournefort* in the *Levant*. This hath a perennial root; the lower leaves are regularly divided into seven or nine parts to the midrib; these segments are sawed on their edges, and end in sharp thorns. The stalks rise a foot and an half high, sending out side branches, garnished with stiff leaves, which are divided into narrower segments than the lower, terminated by three points. The flowers terminate the stalks, sitting close among the leaves, and are of a fine blue, as are also the leaves on the upper part of the stalks, so they make a pretty appearance. It is propagated in the same manner as the three former sorts, and the plants require the same treatment.

The seventh sort grows naturally in *Virginia* and *Carolina*, where it is titled Rattlesnake Weed, from its virtues of curing the bite of that venomous reptile. This hath a perennial root, from which arise several long leaves, sawed on their edges; the leaves are disposed round the root, after the same form of the Aloe or Yucca; they are of a gray colour, near a foot long, and one inch and an half broad, stiff, ending in spines. The stalk is strong, growing two feet and an half high, dividing upward into several foot-stalks, each being terminated by an oval head of flowers, shaped like those of the former sorts; they are white, with a little cast of pale blue.

This sort is propagated by seeds, which, if sown in pots and plunged into a moderate hot-bed, the plants will come up much sooner than those which are sown in the full ground, whereby the plants will be much stronger before the winter. When the plants are fit to remove, they should be each planted in a separate small pot; and if they are plunged into a moderate hot-bed, it will forward their taking root; then they must be gradually inured to bear the open air, into which they may be removed toward the latter end of *May*, and placed among other hardy exotick plants. When the plants have filled these pots with their roots, some of them may be shaken out, and planted in warm borders; the others may be put into larger pots, and in the autumn placed under a common frame, where they may be exposed to the free air in mild weather, but sheltered from severe frost: the following spring these may be turned out of the pots, and planted in a warm situation, where they will endure the cold of our ordinary winters very well; and if in severe frost they are covered with Straw, Peas haulm, or any such light covering, it will secure them from injury.

The eighth sort grows naturally in *Spain* and *Italy*; this puts out oblong plain leaves from the root, which are cut on their edges; the stalks rise a foot high, branch out into many divisions, regularly by pairs; at each of these divisions is situated a small head of flowers, sitting very close between the branches. These have no great beauty, so the plants are seldom cultivated in gardens, except for the sake of variety.

The ninth sort grows naturally on the mountains of *Helvetia* and *Italy*. The root is perennial, the lower leaves are oblong, heart-shaped, and plain; the stalks rise from two to three feet high, branching out on their side, garnished with stiff leaves, which are deeply divided, ending in many points with sharp spines; the flowers terminate the stalks, they are collected into conical heads, and are of a light blue colour, as are also the upper part of the stalks. It is propagated by seeds in the same manner as the other sorts.

The tenth sort grows naturally in the *West-Indies*, where it is much used in medicine, being accounted of great service in the cure of fevers, from whence it hath the appellation of Feverweed in those countries. The roots of this plant are composed of many small fibres, which spread near the surface; the lower leaves are six or seven inches long, narrow at their base, and enlarge upward to an inch in breadth near the top, where they are rounded off on one side like a scymitar; they are finely sawed on their edges, and are of a light green colour; the stalk rises about a foot high, spreading out into many branches, garnished with small leaves, which end in many points; the flowers are produced in small heads which sit close at every division of the stalks, and also at the end of the branches; they are of a dull white colour, so make little appearance.

As this plant is biennial, and grows naturally in hot countries, it will not thrive in *England*, but in a warm stove. It is propagated by seeds, which must be sown on a hot-bed; and when the plants are fit to remove, they should be each planted into a small pot, and plunged into the bark-bed, and afterward treated like other tender plants from the same country; the second year they will produce flowers and frequently ripen seeds, soon after which they commonly decay.

ERYSIMUM. *Lin. Gen. Plant.* 729. Hedge Mustard.

The Characters are,

The flower hath four petals placed in form of a cross, and two mucareous glands situated between the stamina. It hath six stamina, four of which are the length of the empalement, the other two are shorter. It hath a narrow four-cornered germen, which afterward becomes a long, narrow, four-cornered pod with two cells, filled with small round seeds.

The Species are,

1. ERYSIMUM *siliquis spicæ adpressis.* *Hort. Cliff.* 337. Common Hedge Mustard.

2. ERYSIMUM *foliis lyratis extimo subrotundo.* *Flor. Succ.* 557. Winter Cress, with a Rocket leaf and yellow flower.

3. ERYSIMUM *foliis radicalibus lyratis, caulinis pinnato-sinuatis, floribus laxè spicatis.* Smaller early Winter Cress, with a smooth Rocket leaf.

4. ERYSIMUM *foliis radicalibus ovatis integerrimis, petiolis decurrentibus, caulinis oblongis dentatis sessilibus.* Oriental Sifymbrium with the appearance of Water Cress, and a Plantain leaf.

5. ERYSIMUM *foliis cordatis.* *Hort. Cliff.* 338. Dames Violet, smelling like Garlick, commonly called Alliaria, Sauce alone, or Jack by the Hedge.

6. ERYSIMUM *foliis integris lanceolatis.* *Flor. Lapp.* 263. Gilliflower with a Dames Violet leaf.

The first sort is used in medicine; it grows naturally on the side of foot paths, and upon old walls in most parts of *England*, so is rarely cultivated in gardens; where, if it was once admitted, it would soon become a troublesome weed.

The second and third sorts also grow naturally on the banks in many parts of *England*; these were formerly eaten in winter fallads, before the *English* gardens were furnished with better plants; since when they have been rejected, for they have a rank smell, and are disagreeable to the palate.

The fourth sort is not a native of this country, but it has propagated by the scattered seeds in so plentiful a manner, in those gardens where it has been sown, as to become a troublesome weed. The lower leaves of this sort are entire, and of an oblong form; the upper leaves are oblong and indented, in which this differs from the preceding

The fifth sort grows naturally on the sides of banks in many parts of *England*, so is not suffered to have a place in gardens. This was formerly eaten as a fallad herb by

the poorer sort of people, who gave it the title of Sauce alone. It hath a rank smell and taste of Garlick, is very biting and hot on the palate; it is frequently prescribed in medicine.

The sixth sort is sometimes found growing naturally upon old walls in some parts of *England*, particularly at *Cambridge* and *Ely*, at both which places I have observed it. This hath pretty long, hairy, soft leaves at the root; the stalks rise a foot high, their upper part being garnished with small, greenish, white flowers in loose spikes, which are succeeded by long compressed pods, hanging downward. The roots will abide several years, if they have a dry lean soil, or grow upon a wall, for in rich land they soon decay.

ERYTHRINA. *Lin. Gen. Pl.* 762. Coral Tree.

The Characters are,

The flower is of the butterfly kind, composed of five petals; the standard is spear-shaped, long, and rises upward; the two wings are scarce longer than the empalement. The keel is composed of two petals, which are no longer than the wings. It hath ten stamina which are joined below, and unequal in their length, with an awl-shaped germen, which afterward becomes a long swelling pod ending in an acute point, having one cell, filled with kidney-shaped seeds.

The Species are,

1. ERYTHRINA *foliis ternatis, caule simplicissimo inermi.* *Hort. Cliff.* 354. Low Coral Tree, with a very long spike of flowers and thick root, commonly called the *Carolina* Coral Tree.

2. ERYTHRINA *inermis, foliis ternatis, caule arborèo.* Smooth American Coral Tree.

3. ERYTHRINA *foliis ternatis, caule arborèo aculeato.* *Hort. Cliff.* 354. Prickly three-leaved American Coral Tree, with a very red flower.

4. ERYTHRINA *foliis ternatis hastatis, caule fruticoso aculeato.* Smaller three-leaved American Coral Tree, with blacker spines and seeds.

5. ERYTHRINA *foliis ternatis acutis, caule arborèo aculeato, floribus spicatis longissimis.* Three-leaved American Coral Tree, with acute-pointed leaves and scarlet seeds.

6. ERYTHRINA *foliis ternatis acutis, caule fruticoso inermi, corollis longioribus clausis.* Coral Tree without spines, having a longer closer flower.

The first sort grows naturally in *South Carolina*, from whence Mr. Catesby first sent the seeds to *England* in the year 1724. This hath a very large knotty root, which seldom rises more than a foot high, from which come out fresh roots every spring, which grow two feet high, their lower part being garnished with trifoliate leaves of a deep green colour, which are shaped like the point of an arrow; the upper part of the stalks are terminated by a long spike of scarlet flowers, composed of five petals, the upper one being much longer than the other, so that at a small distance the flowers appear to have but one petal. The pods are five or six inches long, swelling in every part where the seeds are lodged, opening in one cell, containing five or six kidney-shaped scarlet seeds.

The second sort hath a thick, irregular, woody stem, which rises about ten or twelve feet high, sending out many strong branches covered with a brown bark, garnished with trifoliate leaves standing upon long foot-stalks, the middle lobe which terminates the leaf, being much longer than the other two; they are heart-shaped, smooth, and of a deep green colour; the flowers come out at the end of the branches, in short thick close spikes, of a deep scarlet colour, and make a fine appearance. These commonly are in beauty in *May* and *June* in this country, but are not succeeded by pods here. The flowers seldom appear till the leaves drop, so that the branches are often naked at the time when the flowers are out.

The third sort chiefly differs from the second, in having its trunk, branches, and the foot-stalks of the leaves, armed with short crooked spines, the leaves and flowers being very like those of the second sort.

The fourth sort hath shrubby stalks, which divide into branches, armed in every part with strong, crooked, black spines; the leaves are smaller than those of the two last sorts, and have a nearer resemblance to those of the first; the foot-stalks and midrib of the leaves are armed with the same sort of spines; the flowers are of a paler scarlet, and grow in looser spikes. The seeds are as large as those of the second sort, but are of a dark purple colour.

The seeds of the fifth sort were first sent me from *La Vera Cruz*, where the plants grow naturally; and since I have received seeds of the same sort from the *Cape of Good Hope*, so that it is a native of both countries. These are not half so large as those of the second or third sorts, and are of a bright scarlet colour; the leaves are also much smaller, and have long acute points; the branches are very closely armed with crooked greenish spines, as are also the ribs and foot-stalks of the leaves. The flowers grow in very long close spikes, and are of a beautiful scarlet colour.

The sixth sort grows in *Jamaica*, and some of the other islands in *America*. The pods of this sort are longer, and not more than half so thick as those of the second sort; the seeds are of a bright scarlet colour; the leaves are small and acute-pointed, the stalks are smooth and without spines; this doth not grow very large, but shoots out into branches at a little distance from the ground, which grow erect, so form a bushy shrub. The flowers come out at the end of the branches in short spikes; the standard of the flower is long, and the sides turn down over the wings, which are also longer than those of the other species, and the whole flower is more closed.

These plants when they produce their flowers, are some of the greatest ornaments to the stoves, for their flowers are produced in large spikes, and are of a beautiful scarlet, so they make a fine appearance, but they do not often flower in any of the northern parts of *Europe*; yet in the countries where they naturally grow, they produce flowers in great plenty every year, so that it is very common there to see most of their branches terminated by large spikes of flowers, when they have no leaves upon them.

These plants are best propagated by seeds, when they can be procured from the countries where they naturally grow. The seeds should be sown in small pots and plunged into a moderate hot-bed, where, if they are good, the plants will come up in a month or five weeks; when they are two inches high, they should be carefully shaken out of the pots, and each planted in a separate small pot, and plunged into a moderate hot-bed of tanners bark, where they must be shaded from the sun till they have taken new root; then they should have a large share of air admitted to them when the weather is warm: as the plants increase in strength, so they must have a larger share of air. In the autumn the plants should be removed into the stove, and for the two or three first winters while the plants are young, they will require more warmth than when they have acquired more strength. During the time the leaves continue in vigour, the plants will require to have water two or three times a week; but when they are destitute of leaves, it must be sparingly given, for moisture then is very hurtful to them. As the plants grow in strength, so they may be more hardily treated, and by managing them differently, there will be a greater chance of getting them to flower. The third sort is frequently planted in the gardens near *Lisbon*, where they annually flower and ripen their seeds.

These plants may also be propagated by cuttings, which, if planted in pots during the summer month, and plunged

into a hot-bed will take root, but the seedling plants are best.

ERYTHRONIUM. *Lin. Gen. Plant.* 375. Dog's Tooth' or Dog's Tooth Violet.

The Characters are,

The flower is bell shaped, composed of six oblong petals, which spread open to their base. It hath six stamina joined to the style. In the center is situated an oblong three cornered germen, which afterward becomes an oblong obtuse capsule, with three cells filled with flat seeds.

The Species are,

1. ERYTHRONIUM *foliis ovatis*. Erythronium with oval leaves; or, Dog's Tooth Violet with a broader and rounder leaf, and a purple red flower.

2. ERYTHRONIUM *foliis lanceolatis*. Dog's Tooth Violet, with a longer and narrower leaf, and a purplish white flower.

The first sort sends out two oval leaves, which are joined at their base, three inches long, and one and an half broad in the middle; these at first embrace each other inclosing the flower, but afterward they spread flat upon the ground; they are spotted with purple and white spots all over their surface; between these rises a single naked stalk about four inches high, of a purple colour; this sustains one flower, composed of six spear-shaped petals, which in this are purple, but in some they are white; the flower hangs downward, and the petals reflex and spread open to their base. In the center is situated the oblong three-cornered germen supporting a single style which is longer than the stamina, and crowned by a triple stigma. The plant flowers early in *April*. The root of this plant is white, oblong, and fleshy, and shaped like a tooth, from whence it had the title of Dog's Tooth.

The second sort differs from the first in the shape of its leaves, which are longer and narrower, and the flowers are a little larger but not so well coloured. They grow naturally in *Hungary*, and in some parts of *Italy*.

They are propagated by offsets from their roots. They love a shady situation and a gentle loamy soil, but should not be too often removed. They may be transplanted any time after the beginning of *June*, when their leaves will be quite decayed, till the middle of *September*; but the roots should not be kept very long out of the ground, for if they shrink, it will often cause them to rot. The roots of these flowers should not be planted scattering in the borders of the flower-garden, but in patches near each other, where they will make a good appearance.

ESPALIERS, are either formed of rows of trees planted about a whole garden or plantation, or in hedges, so as to inclose quarters or separate parts of a garden, which are trained up flat like a hedge, for the defence of tender plants against the violence of wind and weather. See HERBES.

The most commonly received notion of Espaliers are hedges of fruit trees, which are trained up regularly to a lattice of wood work, formed either of Ash-poles, or square long timbers cut out of Fir, &c. and it is of this sort of Espalier that I shall treat in this place.

Espaliers of fruit trees are commonly planted to surround the quarters of a kitchen garden, for which purpose they are of admirable use and beauty; for by laying out the walks of this garden regularly, which are bounded on each side by these hedges, when they are handsomely managed, they have a wonderful effect in sheltering the kitchen plants in the quarters, and also screening them from the sight of persons in the walks; so that a kitchen-garden well laid out in this manner and properly managed, will be equal to the finest regular parterre for beauty.

The trees chiefly planted for Espaliers are Apples, Pears, and some Plumbs, but the two former are mostly used: some

plant Espaliers of Apples grafted upon Paràdise stocks, but these being of humble growth and short duration, are not so proper for this purpose, unless for very small gardens; therefore I should rather advise the having them upon Crab stocks, or (if in smaller gardens, where the trees cannot be allowed to grow so high) upon what the gardeners call the *Dutch stock*; which will cause them to bear sooner, and prevent their growing too luxuriant, and these will continue many years in vigour.

In choosing the trees for an Espalier, the several sorts which are nearly of the same growth should be planted in the same line, that the Espalier may be the more regular, and of an equal height, which greatly adds to their beauty; for if they are planted with trees which shoot unequally, it will be impossible to have the Espalier regular: besides, the distance of the trees must be in proportion to their growth; for some trees, *viz.* those of a larger growth, should be planted thirty or thirty-five feet asunder; whereas those of smaller growth, need not be above twenty-five feet distance.

The width of the walks and borders between these Espaliers should (in a large garden) be fourteen or sixteen feet at least; and if the trees are designed to be carried up pretty high, the distance should be greater, that each side may receive the advantage of the sun and air, which is absolutely necessary, if you would have the fruit well tasted. And if your ground is so situated, that you are at full liberty which way to make the Espaliers, I would advise the placing the lines from the east a little inclining to the south, and toward the west a little inclining to the north, that the sun may shine between the rows in the morning and evening when it is low; for in the middle of the day, when the sun is advanced far above the horizon, it will shine over the tops of the Espaliers, and reach the surface of the earth about the roots, which is a matter of more consequence than many people are aware of.

The sorts of Apples proper for Espaliers, are the Golden Pippin, Nonpareil, Rennette Grise, Aromatick Pippin, *Holland Pippin*, *French Pippin*, *Wheeler's Ruffet*, *Pile's Ruffet*, with some others. The season for planting, and the method of pruning and training these trees may be seen under the articles of APPLES and PRUNING.

The sorts of Pears proper for an Espalier, are chiefly the summer and autumn fruits, for some of the winter Pears seldom succeed in an Espalier. These trees, if designed for a strong moist soil, should be upon Quince stocks; but if for a dry soil, upon free stocks. Their distance of planting must also be regulated by the growth of the trees, which are more unequal in Pears than Apples, and should therefore be more carefully examined before they are planted. As for those Pears upon free stocks, the distance should never be less than thirty feet for moderate growing trees; but for vigorous shooters, forty feet is little enough, especially if the soil be strong, in which case they should be planted at a greater distance. The particular sorts of Pears I would recommend for an Espalier, are the Jargonelle, Blanquette, Summer Boncretien, *Hamden's Burgamot*, Autumn Burgamot, L'Ambrette, Gros Rousselet, Chaumontelle, Beurre du Roy, Cressane, *Holland Bergamot*, and La Chassery; always remembering, that those Pears which are of the melting kind, will do better in Espalier than the breaking Pears, which seldom ripen so well on an Espalier; as also that many sorts of Pears will ripen well on an Espalier in a warm soil and situation, which require a wall in other places. As to the method of planting, see the article PEAR; and for pruning and managing, see PRUNING.

I shall now give directions for making the Espalier, to which the trees are to be trained; but this should not be done until the third year after the trees are planted, for

while they are young, it will be sufficient to drive a few stakes into the ground on each side of the trees, to which the branches should be fastened in an horizontal position, in order to train them properly for the Espalier; which stakes may be placed nearer, or at a farther distance, according as the shoots produced may require, and these will be sufficient for the three first years; for should you frame the Espalier the first year the trees are planted, the Espalier would rot before the trees will cover it. The cheapest method to make these Espaliers is with Ash-poles, of two sorts; one of the largest size, which contains thirteen poles in a bundle, and the other size those of half an hundred. The first or largest size poles, should be cut about seven feet and an half long; these are intended for upright stakes, and must be sharpened at the largest end, that they may, with more ease, be driven into the ground; these should be placed at a foot distance from each other in a direct line, and of an equal height, about six feet above ground; then a row of strait slender poles should be nailed upon the top of the upright stakes, which will keep them exactly even, and continue to cross the stakes with the smaller poles, at about nine inches distance, row from row, from the top to within a foot of the bottom of the stakes. These rows of poles should be fastened with wire to the stakes, which, if painted or oiled will last a long time.

When the Espalier is thus framed, the branches of the trees should be fastened thereto, either with small Osier twigs, rope yarn, or some such binding, training them in a horizontal position, and at equal distances; being careful not to cross any of the branches, nor to lay them in too thick. The distance which should be allowed for the branches of Pears and Apples, must be proportioned to the size of their fruit; such of those whose fruit is large, as the Summer Boncretien, Monsieur John, and Beurre du Roy Pears, and the Rennet Grise, *Holland Pippin*, *French Pippin*, and other large Apples, should have their branches six or eight inches distance at least; and to those of lesser growth, four or five inches will be sufficient. But for farther directions, I shall refer to the articles of the several fruits; as also that of PRUNING, where these particulars will be sufficiently explained.

But besides this sort of Espalier made with Ash-poles, there is another sort that is by many people preferred, which is framed with square timbers cut to a proper size. These, though they appear more lightly, when well fixed and painted, are not of longer duration than one of the former, provided it is well made, and the poles are strong which are set upright; nor will they answer the purpose better, though they are vastly more expensive; for the great beauty of Espaliers consists in the regular training the branches of the trees, which, especially in summer, when the leaves are on, will entirely hide from the sight the frame of the Espalier; therefore all expence in erecting these is needless, farther than making provision to keep the branches of the trees in good order.

EVER-GREEN THORN. See Mespilus.

EVERLASTING PEA. See Lathyrus.

EUONYMUS. *Lin. Gen. Plant.* 240. The Spindle Tree, or Prickwood.

The Characters are,

The flower hath four or five oval petals, which spread open, and four or five short stamina joined at their base to the germen. In the center is situated a large oval germen, which afterward becomes a succulent four or five-cornered coloured capsule, having so many cells as angles, each containing one oval seed.

The Species are,

1. EUONYMUS *foliis lanceolatis, floribus tetandriis, fructu tetragono.* The common Spindle Tree.

2. EUONYMUS

2. *EUONYMUS foliis ovato-lanceolatis, floribus pentandriis, fructu pentagono, pedunculis longissimis.* Broad-leaved Spindle Tree.

3. *EUONYMUS floribus omnibus quinquesidis.* Lin. Sp. Pl. 197. *Virginian Ever-green Spindle Tree*, with rough warty seed vessels.

4. *EUONYMUS foliis pinnatis, fructu racemoso trigono.* Spindle Tree with an unbranching stalk, a winged leaf, and a round fruit, having three seeds.

The first sort grows naturally in *England*, and is very common in hedges. This, when growing in hedges, is seldom seen of any considerable size, but rather appears like a shrub; but if planted single, and trained up like other trees, will have a strong woody stem, and rise more than twenty feet high, dividing into many branches, garnished with spear-shaped leaves, three inches long, and one inch and a quarter broad; they are entire, of a deep green colour, and are placed opposite. The flowers come out in small bunches from the side of the branches, upon slender foot-stalks; they are composed of four whitish petals, which expand in form of a cross. The empalement is divided into four parts. The flowers have four stamina, and the fruit is four-cornered, and opens into four cells. The fruit ripens in *October*, at which time the seed vessels spread open and expose the seeds, which are of a beautiful red colour, so that when the branches are well stored with them, the trees make a good appearance at that season. The wood of this tree is used by the musical instrument makers for tooting of organs and virginal keys; the branches are cut into tooth-picks, for making of skewers, and spindles are made of this wood, from whence the tree was titled Spindle Tree; but in some counties it is called Dogwood.

The second sort grows naturally in *Austria* and *Hungary*; this rises with a stronger stem than the first, and grows to a larger size. The leaves are oval and spear-shaped, about four inches long, and two inches broad in the middle, of a light green colour; they are placed opposite on the branches, with short foot-stalks. The flowers come out from the side of the branches, upon very long slender foot-stalks; these branch out into a loose bunch, so that the flowers stand upon separate foot-stalks. The flowers have five petals, which at first are white, but afterward change to a purple colour; the empalement of the flower is divided into five parts. It hath five stamina, and the fruit is five-cornered; the fruit is also much larger than that of the common sort.

The third sort grows naturally in *Virginia*, *Carolina*, and other parts of *North America*; it rises with a shrubby stalk eight or ten feet high, dividing into many branches, which come out opposite at every joint, garnished with spear-shaped leaves, two inches long, and three quarters of an inch broad; they are placed opposite, and continue all the year. The flowers are produced at the end of the branches, and also from the sides, in small clusters, which are succeeded by round capsules, which are closely armed with rough protuberances.

As this is an ever-green shrub, so it merits a place in curious gardens, and particularly in all plantations of ever-green trees and shrubs; there is a variety of this with variegated leaves, which is preserved in the nursery-gardens.

The fourth sort grows naturally in *Jamaica*, and some of the other islands in the *West-Indies*; this rises with an upright woody stalk, ten or twelve feet high; it divides into two or three short branches, garnished by winged leaves, composed of six or seven pair of small leaves (or lobes); these leaves come out without order, standing upon long foot-stalks. The flowers come out in clusters from the side of the branches, toward their end, and are succeeded by roundish capsules, having a thick brown cover, which open in three cells, each containing a single hard seed.

The two first sorts may be propagated either by seeds, or layers; if by seeds, they should be sown in autumn, soon after they are ripe; then the plants will come up the spring following, but if the seeds are not sown till the spring, the plants will not appear till the year after, whereby a whole year is lost. If they are sown upon a shady border, they will succeed better than when they are more exposed to the sun. When the plants come up, they will require no other care but to keep them clean from weeds till the following autumn, when, as soon as their leaves decay, the plants should be taken up and transplanted into a nursery, in rows two feet distant, and the plants one foot asunder in the rows; in this place they may remain two years, and then they may be removed to the places where they are to remain.

They may also be propagated by laying down the young shoots in the autumn, which will take root in one year, and may then be planted in a nursery, to remain a year or two, then may be planted where they are to remain.

The last sort is too tender to live in this country without the assistance of an hot-house, therefore when any of the plants are brought over, they should be planted in pots, and plunged into the tan-bed, and afterward treated in the same way as other plants from hot countries.

EUPATORIOPHALACRON. See *Verbesina*.

EUPATORIUM. Lin. Gen. Plant. 842. Hemp Agrimony.

The Characters are,

It hath a compound flower, composed of hermaphrodite florets, included in one common scaly empalement, whose scales are narrow, erect, and unequal. The florets have each five short stamina. In the bottom is situated a small germer, which afterward becomes an oblong seed, crowned with down, sitting in the empalement.

The Species are,

1. *EUPATORIUM foliis digitatis.* Hort. Cliff. 396. Common Hemp Agrimony.

2. *EUPATORIUM foliis lanceolato-ovatis, serratis, petiolatis, caule erecto.* Hort. Cliff. 396. *New England Hemp Agrimony*, with Nettle leaves, purplish flowers, and spotted stalks.

3. *EUPATORIUM foliis subverticillatis, lanceolatis serratis, petiolatis rugosis.* Lin. Sp. Pl. 838. *Canada Hemp Agrimony*, with a long rough leaf and purplish stalk.

4. *EUPATORIUM caule volubili, foliis cordatis dentatis acutis.* Hort. Cliff. 396. *Climbing American Hemp Agrimony*, with a spear-like sharp-pointed leaf.

5. *EUPATORIUM foliis sessilibus distinctis subrotundo-cordatis.* Lin. Sp. Plant. 837. *American Hemp Agrimony* with round leaves, having no foot-stalk.

6. *EUPATORIUM foliis ovatis, obtusè serratis petiolatis trinerviis, calycibus simplicibus.* Lin. Sp. Plant. 839. *American Hemp Agrimony*, with a Tree Germander leaf and a white flower.

7. *EUPATORIUM foliis connatis tomentosis.* Hort. Cliff. 396. *Virginian perfoliate Hemp Agrimony*, with long Sage-like leaves, closely surrounding the stalks.

8. *EUPATORIUM foliis cordatis serratis caule erecto arboreo.* Eupatorium with heart-shaped sawed leaves, and an upright tree like stalk.

9. *EUPATORIUM foliis lanceolato-linearibus trinerviis integerrimis.* Lin. Sp. Pl. 836. *Virginian Hemp Agrimony*, with a narrow leaf and white flowers.

10. *EUPATORIUM foliis cordatis acuminatis, caule volubili, floribus spicatis racemosis.* Eupatorium with heart-shaped pointed leaves, a twining stalk, and branching spiked flowers.

11. *EUPATORIUM foliis cordato-ovatis, obtusè serratis petiolatis, calycibus multifloris.* Lin. Sp. Pl. 838. *Hemp Agrimony*, with a Wood Sage leaf and a blue flower.

This last sort grows naturally in *Carolina*, from whence the late Dr. Dale sent me the seeds; the plants flowered very finely the year after they were raised, but never have flowered since, for the roots creep greatly in the ground, but never send up any stalks.

The first sort grows naturally by the side of rivers and ditches in most parts of *England*, and is the only species of this genus, which is known to grow naturally in *Europe*; this is esteemed as a very good vulnerary herb, so stands in the list of medicinal plants. It is seldom admitted into gardens, because wherever it is suffered to seed, the ground will be well stored with the plants to a great distance.

The second sort grows naturally in several parts of *North America*; this hath a perennial root, but an annual stalk, which rises two feet and an half high; it is purple, and has many dark spots upon it. The leaves are rough, oval, and spear-shaped, having foot-stalks; they are placed by threes round the stalk toward the bottom, but upward by pairs opposite at each joint. The stalks are terminated by clusters of purple flowers, growing in a sort of corymbus.

The third sort grows naturally in *North America*; this rises with an upright stalk six or seven feet high, garnished with long, narrow, spear-shaped leaves at each joint; these are deeply sawed on their edges, and the midrib is oblique to the foot stalks; they are placed by fours round the stalk in whorls, and are of a dark green colour. The stalks are terminated by bunches of purple flowers like the last. This hath a perennial root and an annual stalk.

The fourth sort grows naturally in *Virginia* and *Carolina*; this hath a perennial root, which sends out many twining stalks in the spring, which twist about any neighbouring support, and rise to the height of five or six feet, garnished at each joint with two heart-shaped leaves, which are indented on their edges, and terminate in acute points; and at each joint there are two small side branches come out, which are terminated by clusters of white flowers, so that the stalks seem covered with them most part of their length; but as these come pretty late in the season, so unless the summers prove warm, the plants do not flower in *England*.

There is another of these plants with purple flowers, standing upon longer foot-stalks, which was sent me from *Camppeachy*, but the stalks and leaves are like those of this sort, so that I doubt whether it be a distinct species.

The fifth sort grows naturally in *New England* and *Virginia*, from both which countries I have received the seeds; it hath a perennial root and an annual stalk, which rises a foot high, with joints pretty near each other, garnished with roundish heart-shaped leaves, sitting close to the stalks; they are sawed on their edges, of a light green colour. The flowers are produced in small loose panicles at the top of the stalks, which are white, and have two small green leaves immediately under the flowers.

The sixth sort rises with upright stalks three feet high, garnished with oval sawed leaves at each joint, placed opposite, and have very short foot-stalks; from the sides of the stalks, at every joint, is produced two slender branches, which stand erect; these, and the principal stalks also, are terminated by clusters of white flowers, which appear in *August* and *September*, and the stalks decay in winter, but the root is perennial. This grows naturally in *Pensylvania*, and other parts of *America*.

The seventh sort grows naturally in *Virginia* and *Philadelphia*; this hath a perennial root and an annual stalk, which rises three feet high, hairy, and garnished with rough leaves at each joint, which are from three to four inches long, and about an inch broad at their base, gradually lessening to a very acute point; the two leaves are joined at their base, so the stalks seem to grow through them.

The upper part of the stalk divides into several slender foot-stalks, each sustaining a close cluster of white flowers. These come out in *July*, and in warm seasons the seeds will sometimes ripen in *England*.

The eighth sort was sent me by the late Dr. *Houfston* from *La Vera Cruz*, where he found it growing naturally; this hath a thick woody stalk, which rises twelve or fourteen feet high, sending out many channelled branches, covered with a brown bark, garnished with regular heart-shaped leaves, as large as those of the Mulberry tree; they are of a light green colour, and sawed on their edges, placed opposite upon foot stalks, near two inches long; the upper part of the branches are terminated by four or five pair of foot-stalks, which come out opposite from the joints, and the top is terminated by an odd one; these sustain branching panicles of white flowers, which together form a long, loose, pyramidal thyrse, and make a fine appearance, for there are no leaves intermixed with the flowers, but so far as the spike reaches the stalks are naked. This sort has flowered in the *Chelsea* garden, but did not produce seeds.

The ninth sort rises with an upright round stalk, to the height of three feet, sending out several branches toward the top, which come out regularly by pairs; they are garnished with leaves placed opposite, which are two inches and an half long, and about one third of an inch broad, having three longitudinal veins; they are of a light green colour, and entire. The flowers stand upon long foot stalks at the end of the branches, some sustaining one, some two, and others three or four flowers; they are white, and appear late in autumn. This grows naturally in *Carolina*.

The tenth sort was sent me from *Jamaica*, by the late Dr. *Houfston*; this hath slender twining stalks, which fasten themselves to any neighbouring support, and rise eight or ten feet high, sending out small branches by pairs, at most of the upper joints. The leaves on the lower part of the stalk are heart-shaped, ending in acute points; the upper leaves are almost triangular, they are smooth, and of a lucid green; the upper part of the stalks have long branching spikes of white flowers, which are small, and sit close to the foot-stalks.

The eleventh sort grows naturally in *Carolina*; this hath a creeping root, which spreads and multiplies very fast. The stalks rise about two feet high; they are garnished with oval, heart-shaped, sawed leaves. The flowers are produced at the top of the stalks in a sort of corymbus; they are of a fine blue colour, but the roots spread so much as to cause barrenness of flowers after the first year.

All these sorts may be propagated by seeds; several of them ripen their seeds in *England*: these should be sown in autumn, as soon as they are ripe, for then the plants will come up the following spring; but if they are kept out of the ground till spring, the plants will not come up till the year after; and those seeds which are procured from *America* should be sown as soon as they arrive, for though they may not grow the first year, yet there will be a greater certainty of their succeeding, than when they are kept longer out of the ground.

The second, third, fifth, sixth, seventh, and eleventh sorts, are hardy plants, so the seeds of these may be sown in the full ground, but there must be care taken in the sowing to keep the sorts separate; for as the seeds of these plants have a light down adhering to them, they are easily displaced by the least wind, so that the best way will be to sow them in drills; but these should be but shallow, for if the seeds are buried too deep, they will not grow. The bed in which these are sown, should not be too much exposed to the sun, but rather have an east aspect, where the morning sun only reaches it; the ground should be kept pretty moist, for as these plants generally grow in moist shady situations

in their native countries, they will succeed better when they have a soil and situation somewhat like that.

When the young plants come up, they must be kept clean from weeds, and where they are too close, some of them should be drawn out, to give room for the others to grow; and if these are wanted, they may be planted in another bed, where, if they are shaded and watered, they will soon take root; after which they will require no farther care but to keep them clean from weeds till the following autumn, when they may be transplanted to the places where they are to remain. As the roots of some of the sorts spread out to a considerable distance, they should not be allowed less than three feet from any other plants, and some of the largest growing should be allowed four feet. If the soil in which they are planted is a soft gentle loam, they will thrive much better, and flower stronger than in light dry ground, in which if they are not duly watered in dry summers, their leaves will shrink, and their stalks will not grow to half their usual height.

All these sorts have perennial roots, by which they may be propagated; for as some of them do not perfect their seeds in *England*, so the other is the only way of increasing the plants here; those which have creeping roots send out offsets in great plenty, so are easily propagated; and the others may be taken up, or the heads taken off from them every other year, in doing of which there should be care taken not to cut or injure the old plants too much. The best time to remove these plants is in autumn, as soon as they have done growing, that they may get fresh roots before the frost comes on; but if that should happen soon after their removal, if the surface of the ground is covered with tan, or dried leaves, to keep out the frost, it will effectually secure them; and if this is done to the old plants in very severe winters, it will always preserve them.

The fourth sort sends out many weak twining stalks which require support, so there should be some stakes fixed down by their roots in the spring when they begin to shoot, to which the young stalks should be led and fastened, and afterward they will naturally twine round them, and rise four or five feet high; if they are supplied with water, in warm seasons they will produce plenty of white flowers in *August*. This sort is sometimes killed in very severe winters, if they are not covered; but if when the stalks decay in the autumn, the ground about them be covered with some old tanners bark, it will effectually secure the roots.

EUPHORBIA. *Lin. Gen. Pl.* 536. Spurge.

The Characters are,

The flower hath four or five thick truncated petals, and twelve or more stamina which are inserted in the receptacle. In the center is situated a three-cornered germen, supporting three bifid styles, which afterward becomes a roundish capsule with three cells, each containing one roundish seed.

The Species are,

1. EUPHORBIA *aculeata triangularis subnuda articulata, ramis patentibus. Lin. Hort. Cliff.* 196. Prickly triangular-pointed Euphorbia, with spreading branches, commonly called the true Euphorbium of the ancients.

2. EUPHORBIA *aculeata nuda subquingularis, aculeis geminatis. Hort. Cliff.* 196. Canary Euphorbium, with four or five angles, which have twin spines.

3. EUPHORBIA *aculeata nuda triangularis articulata, ramis erectis.* Prickly Euphorbium, having three and four angles with compressed branches.

4. EUPHORBIA *aculeata nuda multangularis, aculeis geminatis. Lin. Hort. Cliff.* 196. Torch-shaped Euphorbium, with thick stalks armed with strong twin spines.

5. EUPHORBIA *aculeata seminuda, angulis oblique tuberculatis. Lin. Hort. Cliff.* 196. Angular Euphorbium, with broad Oleander leaves.

6. EUPHORBIA *aculeata nuda, septem angularis, spinis solitariis subulatis floriferis. Lin. Hort. Cliff.* 196. Euphorbium with seven angles, and very long single spines bearing fruit at their tops.

7. EUPHORBIA *inermis testa tuberculis imbricatis, foliolo lineari instructis. Lin. Hort. Cliff.* 197. African Euphorbium with a thick scaly stalk, and branches disposed like *Medusa's* head.

8. EUPHORBIA *aculeata nuda, angulis tuberosis spinis interstinctis. Lin. Sp. Pl.* 451. Euphorbium with many angles, and long spines growing out from between the knots.

9. EUPHORBIA *aculeata nuda, multangularis, spinis solitariis subulatis. Prod. Leyd.* 195. Euphorbium with the appearance of Torch Thistle, and a slender stalk.

10. EUPHORBIA *inermis imbricata tuberculis foliolo lineari instructis. Hort. Cliff.* 197. African Euphorbium with the appearance of Pine fruit, commonly called Little *Medusa's* Head.

11. EUPHORBIA *inermis, ramis patulis simplicibus teretibus, foliis linearibus instructis.* Euphorbia without spines, and single spreading branches which are taper, terminated with very narrow leaves.

12. EUPHORBIA *inermis ramis teretibus procumbentibus tuberculis quadrangulis.* Euphorbia without spines, with trailing branches and quadrangular tubercles.

13. EUPHORBIA *inermis, ramis plurimis procumbentibus, squamosis, foliis deciduis.* Euphorbia without spines, having many trailing branches which are scaly, and deciduous leaves.

14. EUPHORBIA *inermis fruticosa subnuda filiformis erecta, ramis patulis determinate confertis. Lin. Hort. Cliff.* 197. Indian shrubby Spurge.

15. EUPHORBIA *inermis fruticosa nuda filiformis volubilis, cicatricibus oppositis. Hort. Cliff.* 197. Indian Spurge, with slender twining stalks entirely without leaves.

16. EUPHORBIA *inermis fruticosa seminuda filiformis flaccida, foliis alternis. Lin. Hort. Cliff.* 197. Mauritanian Spurge without leaves.

17. EUPHORBIA *foliis oppositis subcordatis petiolatis emarginatis integerrimis, caule fruticoso. Lin. Sp. Plant.* 453. Tree American Spurge with a *Venice* Sumach leaf.

18. EUPHORBIA *umbellâ quadrifidâ, dichotomâ, foliis oppositis integerrimis. Lin. Sp. Plant.* 457. Broad-leaved Spurge, called *Cataputia minor*.

19. EUPHORBIA *umbellâ subobtusidâ, bifidâ, involuclis subovatis, foliis spatulatis patentibus carnosiss mucronatis margine scabris. Lin. Sp. Plant.* 461. Broad-leaved Myrtle Spurge.

20. EUPHORBIA *umbellâ multifidâ, dichotomâ, involuclis subcordatis, primariis triphyllis, caule arboreo. Lin. Sp. Plant.* 462. Myrtle-leaved Tree Spurge.

21. EUPHORBIA *umbellâ multifidâ, dichotomâ, involuclis perfoliatis orbiculatis, foliis obtusis. Lin. Sp. Plant.* 463. Common Wood Spurge.

22. EUPHORBIA *umbellâ multifidâ, subtrifidâ, bifidâ, involuclis ovatis, foliis lanceolatis, ramis sterilibus. Lin. Sp. Pl.* 462. Shrubby Marsh Spurge.

23. EUPHORBIA *umbellâ quinquesidâ, quadrifidâ, dichotomâ, involuclis subrotundis acutis, foliis lanceolatis. Lin. Sp. Plant.* 460. Eastern Spurge with a Willow leaf, a purple stalk, and large flower.

24. EUPHORBIA *umbellâ quinquesidâ, trifidâ, dichotomâ, involuclis ovatis, foliis lanceolatis, capsulis lanatis. Lin. Sp. Plant.* 460. Tree Spurge with a red stalk, a *St. John's* Wort leaf, and bearded capsule.

25. EUPHORBIA *umbellâ sextifidâ, dichotomâ, involuclis ovalibus, foliis integerrimis, ramis nullis capsulis verrucosis. Lin. Sp. Pl.* 462. Irish Spurge, called *Machingboy*.

26. *EUPHORBIA umbellâ quinquesidâ, bifidâ, involucellis obcordatis. Lin. Sp. Plant. 457.* Spurge with a tuberous Pear-shaped root.

27. *EUPHORBIA umbellâ quinquesidâ, dichotomâ, involucellis ovato-lanceolatis mucronatis, foliis inferioribus setaceis. Lin. Sp. Plant. 458.* Cypress Spurge.

28. *EUPHORBIA umbellâ multifidâ, bifidâ, involucellis orbiculatis, foliis lineari lanceolatis villosis. Cretan Wood Spurge,* with narrow, hairy, and hoary leaves.

29. *EUPHORBIA umbellâ multifidâ, dichotomâ, involucellis perfoliatis, subcordatis, foliis lanceolatis integerrimis. Lin. Sp. Pl. 463.* Wood Spurge with a moon-shaped flower.

30. *EUPHORBIA inermis foliis ferratis petiolatis difformibus ovatis lanceolatis panduriformibus. Lin. Sp. Plant. 453.* Spurge from *Curassao*, with variable leaves like Willow and Orach, and a green stalk.

31. *EUPHORBIA dichotomâ, foliis ferratis ovali-oblongis glabris, corymbis terminalibus, ramis divaricatis. Lin. Sp. Pl. 454.* Upright acrid Spurge, with smooth Pellitory leaves, and flowers growing in clusters from the joints of the stalk.

32. *EUPHORBIA inermis, herbacea, ramosa, foliis subcordatis integerrimis petiolatis floribus solitariis. Lin. Sp. Pl. 453.* Upright, annual, branching Spurge of *America*, with leaves like Small Basil.

The first sort has been generally taken for the true Euphorbium of the ancients, and as such hath been directed for medicinal use; but it is from the second sort, that the drug now imported under that title in *England* is taken. Dr. *Linnaeus* supposes the fourth to be the sort which should be used, though as they are all nearly of the same quality, so it may be indifferent which of them that drug is taken from, which is the inspissated juice of the plant.

The first sort hath a triangular, compressed, succulent stalk, which is jointed, and rises to the height of seven or eight feet, sending out many irregular twisting branches, for the most part three-cornered, but have sometimes only two, and at others four angles; they are compressed, succulent, and spread out on every side the stalk; at the extremity of the branches there are a few short roundish leaves, which soon fall off; and near these come out now and then a few flowers, which have five thick whitish petals, with a large three-cornered germen in the center, which soon drop off without having any seeds. It grows naturally in *India*.

The second sort grows naturally in the *Canary* islands, from whence I have been credibly informed, the Euphorbium which is imported in *England*, is now brought, and is the inspissated juice of this plant. In its native country, it grows to the height of twenty feet or more, but in *England* it is rarely seen more than six or eight; nor is it of any advantage to have them so tall here, because they send out many branches which are large and succulent, so render the plants too heavy to be easily removed. It hath a very thick succulent stalk, with four or five large angles or corners, closely armed with black crooked spines, which come out by pairs at every indenture: the stalks send out large succulent branches of the same form, which turn their ends upwards, so that when the plants are well grown, they have some resemblance to a branched chandelier; these are closely armed with black spines like the stalks; at the end of the branches come out the flowers, which are shaped like those of the first sort.

The third sort hath a naked, three-cornered, compressed stalk, sending out a great number of erect branches, which join up to the main stalk, and are generally three-cornered, but some vary to four; they are jointed and armed with short crooked spines, but have no leaves, nor do the plants produce flowers here. This grows naturally in *India*.

The fourth sort puts out many stalks just above the surface of the ground, which are thick, succulent, and taper, hav-

ing eight or ten angles while they are young, but as they grow old they loose their angles, and become round; the branches grow distorted and irregular, first horizontal, and afterward turn upward; they are armed with small crooked spines on their angles, and on the upper part of the branches come out the flowers, which are small, and of a greenish white, shaped like those of the second sort. This grows naturally in *India*.

The fifth sort rises with a strong upright stalk five or six feet high, which hath irregular angles, and protuberances which are oblique to the angles; the lower part of the stalk is naked, the upper part is branching, and the branches are armed with crooked spines; at every protuberance they are garnished with oblong leaves of a lucid green, which are very smooth, entire, and rounded at their ends; these fall off, and the plants remain naked for some months, and then the flowers come out, which sit close to the branches, of a greenish white colour; the leaves come out in the autumn, and fall off in the spring.

The sixth sort rises with a roundish, upright, succulent stalk about three feet high, putting out several branches on the side of the same form; which have seven angles or furrows, armed with long, single, black thorns; at the end of which come out small flowers, of the same form with those of the other sorts, and are sometimes succeeded by small fruit.

The seventh sort hath thick, roundish, succulent stalks, which are scaly, sending out many branches from their sides of the same form, which are twisted, and run one over another, so as to appear like a parcel of serpents coming out from the stalks, from whence it had the appellation of *Medusa's Head*. The ends of the branches are garnished with narrow, thick, succulent leaves, which soon drop off, and round the upper part of the branches the flowers come out, which are white, and of the same form with those of the other species, but larger, and are frequently succeeded by round smooth capsules with three cells, each including a single roundish seed.

The eighth sort hath roundish stalks, which swell out like a belly in the middle, and have knobbed angles, between which come out long spines which are strait; these stalks rise two feet high, and put out a few branches on their side of the same form; the flowers are produced at the end of the branches, sitting close upon the angles; they are small, of a yellowish green colour, and shaped like those of the other species.

The ninth sort hath stalks and branches very like those of the fourth, but much slenderer; the spines of this are single, and those of the other double, and the ends of the branches are closely garnished with flowers on every angle, in which it differs from the fourth sort.

The tenth sort hath a thick short stalk, which seldom rises more than eight or ten inches high, from which come out a great number of trailing branches which are slender, and grow about a foot in length: these intermix with each other like those of the seventh sort, but they are much smaller, and do not grow near so long, but has the same appearance, from whence it is called *Little Medusa's Head*; the ends of these branches are beset with narrow leaves, between which the flowers come out which are white, and shaped like those of the other species.

The eleventh sort rises with a taper stalk six or seven inches high, sending out from the top a few taper branches, which spread out on every side; these are not scaly, like those of the last sort, but taper, and garnished at their ends with several small narrow leaves which drop off.

The twelfth sort hath a short thick stalk, which never rises three inches high, so that the branches spread on the surface of the ground; these seldom grow more than six inches

inches long, and their scales swell into a sort of protuberances which are square; they have no leaves, and very rarely produce flowers in *England*.

The thirteenth sort is very like the seventh, but the stalks never rise more than a foot or fifteen inches high, so that the branches spread out near the ground; these are much shorter than those of the seventh, but have the same appearance, and are garnished with narrow leaves at their end, which fall off as the branches are extended in length: this produces a great number of small white flowers at the end of the branches, which are shaped like those of the other species, and are frequently succeeded by smooth round capsules with three cells, including one or two roundish seeds which ripen here.

These sorts have been by most of the modern botanists ranged under title of Euphorbium, and have been distinguished from the Tithymali, more from the structure and outward appearance of the plants, than any real difference in their characters; but as the number of species of those commonly called Spurge was very great, so many of the writers were willing to separate the Euphorbia from that genus, to lessen the number of species.

These plants are preserved in many curious gardens, more for the oddness of their structure, than any real beauty; but being so extremely different in their form, from almost any plants of *European* production, many curious persons have been induced to preserve the several sorts in their gardens.

They are all of them full of a milky acrid juice, which flows out on their being wounded in any part; this juice will blister the flesh, if it happens to lie upon any tender part for a short time, and will burn linen almost as bad as aqua fortis, therefore the plants should be handled with great caution: nor should the ends of their branches be ever bruised or injured, for if they are, it frequently occasions their rotting down to the next joint, and sometimes will destroy the whole plant, if those injured branches are not cut off in time; so that whenever the branches appear to have been injured, the sooner they are cut from the plants, the less danger there will be of their suffering from it; nor should any of the branches be cut between the joints, for the same reason.

The greatest part of these milky succulent plants grow naturally upon barren rocky places, or in dry sandy soils, where few other plants will thrive; therefore they should never be planted in rich earth here, nor suffered to receive much wet, which will cause them to rot. The best mixture of earth for these plants is, about a fourth part of screened lime rubbish, a fourth part of sea sand, and half of light fresh earth from a common; these should be mixed well together, and frequently turned over before it is used, that the parts may be incorporated, and the compost sweetened by being exposed to the air.

All the sorts are easily propagated by cuttings, which should be taken from the old plants in *June*; they must be cut at a joint, otherwise they will rot: when these cuttings are taken off, the milky juice of the old plants will flow out in plenty; therefore there should be some dry earth or sand applied upon the wounded part, which will harden and stop the sap from flowing out; and the wounded part of the cuttings should also be rubbed in sand, or dry earth, for the same purpose; then the cuttings should be laid in a dry part of the stove, for ten days or a fortnight; and some of those whose branches are large and very succulent, may lie a month or more before they are planted, that their wounds may be healed and hardened, otherwise they will rot. When the cuttings are planted, they should be each put into a small halfpenny pot, laying stones or rubbish in the bottom, and filling the pots with the mixture

before directed; then plunge the pots into a moderate hot-bed, and if the weather is very hot, the glasses of the hot-bed should be shaded in the middle of the day, and the cuttings should be gently watered once a week, according as the earth may dry: in about six weeks the cuttings will have put out roots, so if the bed is not very warm, the plants may continue there, provided they have free air admitted to them every day, otherwise it will be better to remove them into the stove, where they may be hardened before the winter; for if they are too much drawn in summer, they are very apt to decay in winter, unless they are very carefully managed. During the summer season, these plants should be gently watered once a week, according to the warmth of the season; but in winter they must not be watered oftener than once in a fortnight, or three weeks, which should be given more sparingly at that season, especially if the stove is not warm: the first sort will require more warmth in the winter than any of the other, as also less water. This, if well managed, will grow seven or eight feet high, but the plants must constantly remain in the stove, giving them a large share of air in warm weather, and in winter the stove should be kept in a temperate degree of warmth.

The sixth sort is at present the most rare in *England*, for most of the plants have been destroyed by placing them in stoves, where, by the heat, they have in one day turned black, and rotted immediately after. This sort may be placed in winter in a dry airy glass-case, with other succulent plants, where they may have free air in mild weather, and be protected from frost; in summer the plants may be exposed in the open air, in a warm situation, but should be screened from too much wet: with this treatment they will thrive much better than if they are more tenderly nursed.

The seventh, eighth, tenth, eleventh, twelfth, and thirteenth sorts, are also pretty hardy, so will live in a good glass-case in winter without fire, provided the frost is kept entirely out, and in summer they may be placed abroad in a warm situation: as these are very succulent plants, they should not have too much wet; therefore, if the summer should prove very moist, it will be very proper to place them under some shelter, where they may enjoy the free air, but may be screened from the rain.

The seventh sort will require to be supported, otherwise the weight of the branches will draw them upon the pots; and, by training of the stems up to stakes, they will grow four or five feet high, and a great number of side branches will be produced; these being very succulent and heavy, are very apt to draw down the stem, if it hath not support.

The following sorts have been, by all the writers on botany, placed under the title of Tithymalus; but the fourteenth and fifteenth sorts should, according to their own distinction, have been placed in the genus of Euphorbia, because they are as destitute of leaves as most of the species which they have there placed.

The fourteenth sort rises with a taper succulent stalk, to the height of eighteen or twenty feet, sending out many branches of the same form, which subdivide into many smaller, which are jointed; they are smooth, and of a deep green colour, with a few small leaves at their extremities, which soon fall off. As the plants grow older, so their stalks become stronger and less succulent, especially toward the bottom, when they turn to a brown colour, and become a little woody. The branches grow diffused and intermix with each other, so form a sort of bush toward the top.

The fifteenth sort sends out a great number of slender taper stalks, of a dark green colour, which are smooth, and

and twist about each other, or any neighbouring support, whereby they will rise to the height of ten or twelve feet, putting out smaller branches upward, which also twine and intermix with the other stalks; they are naked, having no leaves.

The sixteenth sort sends out many taper succulent stalks from the root, which rise about four feet high; they are slender and weak, so require support to prevent their falling to the ground; these have a light green bark, their lower parts are naked, but their upper parts are garnished with oblong leaves, which are smooth, entire, and placed alternate on every side the stalks: the flowers are produced in small clusters at the end of the branches, they are of a yellowish green colour, and are sometimes succeeded by smooth round fruit, but the seeds rarely ripen in *England*. This sort grows naturally on the *African* shore in the *Mediterranean*.

The seventeenth sort grows naturally in most of the islands in the *West-Indies*, and also upon the continent there. This hath an upright stalk, which rises to the height of six or seven feet, covered with a light brown bark; it divides upward into many branches, garnished with roundish leaves, indented at their ends: they are smooth and of a beautiful green, but fall away in winter; so that in the spring, they are almost naked; the flowers come out from the end of the branches, which are yellow and small, soon falling away without having any fruit succeed them here.

These sorts are propagated by cuttings, in the same manner as the *Euphorbia*, and the plants must be treated in the same way, as hath been directed for them.

The fourteenth, fifteenth, and seventeenth sorts are tender, so require a stove, and must have the same treatment as the tender kinds of *Euphorbiums*, but the sixteenth sort will live in a common green-house in winter, and may be exposed abroad in the summer.

The eighteenth sort stands in the list of medicinal plants, but is rarely used in *England* at present; this is a biennial plant, which perishes after the seeds are ripe. It grows naturally in *Italy* and the south of *France*, and where it is allowed to scatter its seeds in a garden, becomes a weed here. This rises with an upright succulent stalk, from three to four feet high, garnished with oblong smooth leaves placed opposite, sitting close to the stalks; the upper part of the stalk divides by pairs into smaller branches, and from the fork between these divisions come out the umbels of flowers, each fork having one; that which is situated in the first division being the largest, and those in the upper are the smallest. The flowers are of a greenish yellow colour, the fruit follows soon after, which is divided into three lobes, has three cells, each containing one roundish seed, which is cast out to a distance by the elasticity of the capsule. This sort will propagate itself fast enough when it is once introduced into gardens, so requires no care but to keep it clean from weeds.

The nineteenth sort grows naturally in the south of *France*, in *Spain*, and *Italy*. This sends out many trailing branches from the root, which grow about a foot long, lying upon the ground, closely garnished with thick, flat, succulent leaves placed alternate, sitting close to the stalks: the flowers are produced in large umbels at the end of the branches; the involucre of the principal umbel is composed of several oval-pointed leaves, but those of the small umbels have only two heart-shaped concave leaves, whose borders are rough; the flowers are yellow, and are succeeded by three seeds, inclosed in a roundish capsule with three cells. This plant will continue two or three years upon a dry warm soil, and will ripen seeds annually, which, if permitted to scatter, the plants will come up, and require no other care but to keep them clean from weeds.

The twentieth sort grows naturally in *Crete*, and in several islands of the *Archipelago*; this has a great resemblance to the common Wood Spurge, but the leaves are narrower, longer, and are hoary. It is easily propagated by cuttings during any of the summer months, and requires a little protection from the frost in hard winters.

The twenty-first sort grows naturally in the woods, in many parts of *England*; it rises with a shrubby stalk three feet high; the flowers are produced in umbels sitting close to the stalks, so form a long spike; the empalements are of a greenish yellow, and the petals black, so they make an odd appearance. It flowers in *May*, and the seeds ripen in *July*. If the seeds of this are sown under trees in the autumn, the plants will rise the following spring, and require no culture.

The twenty-second sort stands in the list of medicinal plants by the title of *Esula major*, but at present is seldom used: it grows naturally in *France* and *Germany* upon marshy places, where it rises three or four feet high. It hath a perennial root, by which it may be propagated better than by seeds, which seldom grow unless they are sown soon after they are ripe.

The twenty-third sort was discovered in the *Levant* by *Dr. Tournefort*. This hath a perennial root, from which arise succulent stalks three feet high, covered with a purple bark, garnished with oblong smooth leaves, shaped like those of *Willow*, of a dark green colour. The upper part of the stalks divide, and in the fork is situated an umbel of flowers, of a greenish yellow colour, which are succeeded by round capsules with three cells, each containing a single seed. It flowers in *June*, and the seeds are ripe in *August*; this may be propagated by parting of the roots, or by sowing of the seeds in autumn. The plant is hardy, so will endure the greatest cold of this country, if it is planted in a dry soil.

The twenty-fourth sort grows naturally in *Sicily*, and on the borders of the *Mediterranean* sea; this rises with several shrubby stalks to the height of five or six feet, garnished with oblong, smooth, blunt leaves, which are placed alternate. The flowers are yellow, and grow in small umbels from the division of their branches, and are succeeded by roundish capsules which are rough, having three cells like the other species. This is easily propagated by cuttings during any of the summer months, and requires protection from the frost in winter.

The twenty-fifth sort grows naturally in *Ireland*. This hath thick fibrous roots, which send up several erect stalks, about a foot long, garnished with oblong leaves, placed alternate. The flowers are yellow, and are produced in small umbels at the top of the stalks, and are succeeded by rough warted capsules with three cells. This may be propagated by the roots, which should be planted in a shady situation and a moist soil.

The twenty-sixth sort grows naturally in the *Levant*; this hath a knobbed Pear-shaped root, from which arise two or three stalks, about a foot high, garnished with oblong hairy leaves placed alternate. The flowers are produced in small umbels from the divisions of the stalk; they are small, of a greenish yellow colour, and are seldom succeeded by seeds here. It may be propagated by offsets, sent out from the main root; these may be taken off in autumn, and planted in a shady situation, where they will thrive better than in the full sun.

The twenty-seventh sort grows naturally at *Aleppo*, and in other parts of the *Levant*; this hath a perennial creeping root, by which it multiplies very fast where it is once established. The stalks of this rise a foot and an half high; the lower leaves are narrow, stiff, and bristly; but those on the upper part of the stalk are shaped like the narrow-leaved

leaved Myrtle. The flowers are yellow, and are produced in large umbels from the divisions of the stalk, but are rarely succeeded by seeds in this country. The roots of this should be confined in pots, for when they are planted in the full ground, they creep about to a great distance.

The twenty-eighth sort grows naturally in many parts of the *Levant*, and also in *Spain* and *Portugal*. The seeds of this were sent me from *Portugal*, by *Robert More*, Esq; who found the plants growing there naturally. It rises with a purple shrubby stalk, three feet high, garnished with narrow, spear-shaped, hairy leaves, set closely on the stalk alternately; the upper part of the stalk is terminated by umbels of flowers, which form a sort of spike. The greater umbels are multifid, but the small ones are bifid. The involucrum of the flowers are yellow, and the petals of the flowers black. The young plants which have been raised from seeds are generally fruitful, but the old ones, and those raised by cuttings are barren: this may be propagated by cuttings, and will live abroad if planted in a dry rubbishy soil and a warm situation, otherwise they are frequently killed by severe frost.

The twenty-ninth sort grows naturally in the south of *France*, in *Spain*, and *Italy*; it is a biennial plant, from whose root arise two or three stalks, which grow two or three feet high, garnished with spear-shaped leaves, which are entire. The umbels of flowers arise from the division of the branches; the involucrum are heart-shaped, and surround the pedicle at their base. The flowers are yellow, and appear in *June*. The seeds ripen in *August*, which, if permitted to scatter, the plants will come up, and require no care.

The thirtieth sort grows naturally at *La Vera Cruz*. This is an annual plant, which rises from two to three feet high. The leaves are sometimes narrow and entire, at other times oval, and divided in the middle almost to the midrib, in shape of a fiddle; they also vary in their colour, some being

inclined to purple, others of a light green, sawed on their edges, and stand upon short foot-stalks. The flowers are produced in small umbels at the end of the branches, of a greenish white, and are succeeded by small round capsules with three cells.

The thirty-first sort grows naturally in most of the islands in the *West-Indies*; it is an annual plant, which rises with a branching stalk about two feet high, garnished with oblong, oval, smooth leaves, sawed on their edges. The flowers grow in small umbels at the foot-stalks of the leaves, gathered into close bunches; they are white, and are succeeded by small round capsules, inclosing three seeds.

The seeds of the thirty-second sort were sent me from *La Vera Cruz*, by the late *Dr. Houstoun*; this is also an annual plant, which rises with an upright stalk about a foot high, dividing into a great number of branches, which spread very wide, garnished with roundish heart-shaped leaves, which are entire, standing upon pretty long foot-stalks. The flowers come out singly from the divisions of the stalk; they are small, and of an herbaceous colour, and are succeeded by small round capsules, containing three seeds.

The last three sorts are annual; the seeds of these must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a small pot filled with light earth, and plunged into the hot-bed again, and must afterward be treated in the same manner as other tender annual plants from warm countries.

EUPHRASIA, Eyebright.

This is a medicinal plant, which grows naturally in sterile fields and commons in most parts of *England*, always among Grass, Heath, Furz, or some other cover, and will not grow when these are cleared from about it, nor will the seeds grow when they are sown in a garden; for which reason I shall not trouble the reader with a description, or any farther account of it, than that the herb-women supply the markets with it in plenty from the fields.

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FABA. *Tourn. Inst. R. H. 391. tab. 212.* The Bean.

The Characters are,

The flower is of the butterfly kind. The standard is large, oval, and indented at the end; it hath two oblong erect wings, which inclose the keel, being much longer. The keel is short, swelling, and closely covers the parts of generation; the nine stamina are in three parts, and one stands separate. At the bottom is situated an oblong compressed germen, which afterward becomes a long, compressed, leathery pod, having one cell, filled with compressed kidney shaped seeds.

There are several varieties of the Garden Bean, which are known and distinguished by the gardeners, but do not essentially differ from each other, so I shall not enumerate them as distinct species, but shall not join these to the Horse Bean, as some have done, who have supposed them to be but one species; for, from having cultivated them more than thirty years, without finding the Garden Bean degenerate to

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the Horse Bean, or the latter improving to the former, I conclude they are distinct.

There are a great variety of the Garden Beans, now cultivated in the kitchen gardens in *England*, which differ in size and shape; some of them producing their pods much earlier in the year than others, for which they are greatly esteemed by the gardeners, whose profit arises from their early crops of most esculent plants.

I shall begin with the Garden Bean, called by the botanists *Faba major*, to distinguish it from the Horse Bean, which they have titled *Faba minor seu equina*, and shall only mention the names of each variety, by which they are known among the gardeners, placing them according to their time of ripening for the table.

The *Mazagan* Bean is the first and best sort of early Beans at present known; these are brought from a settlement of the *Portuguese* of the same name on the coast of *Africa*, just

without the freights of *Gibraltar*; the seeds of this sort are much smaller than those of the Horse Bean, and as the *Portuguese* are but slovenly gardeners, there is commonly a great number of bad seeds among them. If this sort is sown in *October*, under a warm hedge, pale, or wall, and carefully earthed up when the plants are advanced, they will be fit for the table by the beginning of *May*: the stems of this sort are very slender, therefore should be supported by strings close to the hedge, or pale, to preserve them from the morning frosts, which are sometimes severe in the spring, and retards their growth; these Beans bear plentifully, but they ripen nearly together, so that there are seldom more than two gatherings from the same plants; if the seeds of this sort are saved two years in *England*, the Beans will become much larger, and not ripen so soon, which is called a degeneracy.

The next sort is the early *Portugal* Bean, which appears to be the *Mazagan* sort saved in *Portugal*, for it is very like those which are the first year saved in *England*; this is the most common sort used by the gardeners for their first crop, but they are not near so well tasted as the *Mazagan*; therefore when the *Mazagan* Bean can be procured, no person of skill would plant the other.

The next is the small *Spanish* Bean; this will come in soon after the *Portugal* sort, and is a sweeter Bean, therefore should be preferred to it.

Then comes the broad *Spanish*, which is a little later than the other, but comes in before the common sorts, and is a good bearer, therefore is frequently planted.

The *Sandwich* Bean comes soon after the *Spanish*, and is almost as large as the *Windsor* Bean, but, being hardier, is commonly sown a month sooner; this is a plentiful bearer.

The *Toker* Bean, as it is generally called, comes about the same time with the *Sandwich*, and is a great bearer, therefore is now much planted.

The white and black Blossom Beans are also by some persons much esteemed; the Beans of the former are, when boiled, almost as green as Pease, and being a sweet Bean, renders it more valuable; these sorts are very apt to degenerate, if their seeds are not saved with great care.

The *Windsor* Bean is allowed to be the best of all the sorts for the table; when these are planted on a good soil, and are allowed sufficient room, their seeds will be very large, and in great plenty; and when they are gathered young, are the sweetest and best tasted of all the sorts; but these should be carefully saved, by pulling out such of the plants as are not perfectly right, and afterward by sorting out all the good from the bad Beans when they are out of the pods.

This sort of Bean is seldom planted before *Christmas*, because it will not bear the frost so well as many of the other sorts, so it is generally planted for the great crop, to come in *June* and *July*.

All the early Beans are generally planted on warm borders, near walls, pales, and hedges; and those which are designed to come first, are usually planted in a single row pretty close to the fence: but here I cannot help taking notice of a very bad custom, which too generally prevails in gentlemen's kitchen-gardens, which is that of planting Beans close to the garden walls, on the best aspects, immediately before the fruit trees, which certainly is a greater prejudice to the trees, than the value of the Beans, or any other early crop, therefore this practice should be every where discouraged; for it is much better to run some Reed hedges across the quarters of the kitchen-garden, where early Beans and Pease may be planted, in which places they may with more conveniency be covered in severe frost; and to these hedges the Beans may be closely fastened, as they advance in their growth; which, if practised against their walls where good fruit trees are planted, will greatly prejudice them.

But to return to the culture of the Beans. Those which are planted early in *October*, will come up by the beginning or middle of *November*; and as soon as they are two inches above ground, the earth should be carefully drawn up with a hoe to their stems, and this must be two or three times repeated, as the Beans advance in height, which will protect their stems from the frost. If the winter should prove severe, it will be very proper to cover the Beans with Pease haulm, Fern, or some other light covering, which will secure them from the injury of frost; but this covering must be constantly taken off in mild weather, otherwise the Beans will draw up tall and weak, so come to little; and if the surface of the border is covered with tanners bark, it will prevent the frost from penetrating of the ground to the roots of the Beans, and be of great service to protect them from the injury which they might otherwise receive.

In the spring, when the Beans are advanced to be a foot high, they should be fastened up to the hedge with pack-thread, so as to draw them as close as possible; which will secure them from being injured by the morning frosts, which are often so severe in *April*, as to lay those Beans flat on the ground, which are not thus guarded; at this time all suckers which come out from the roots should be very carefully taken off, for these will retard the growth of the Bean, and prevent their coming early. When the blossoms begin to open toward the bottom of the stalks, the top of the stems should be pinched off, which will cause those first pods to stand, and thereby bring them forward. If these rules are observed, and the ground kept clean from weeds, or other plants, there will be little danger of their failing.

But lest this first crop should be destroyed by frost, it will be absolutely necessary to plant more about three weeks after the first, and so to repeat planting more every three weeks, or a month, till *February*; but those which are planted towards the end of *November*, or the beginning of *December*, may be planted on sloping banks, at a distance from the hedges; for if the weather should prove mild, these will not appear above ground before *Christmas*; therefore will not be in so much danger as the first and second planting, especially if the surface of the ground is covered with tan to keep the frost out of the ground. The same directions which are before given will be sufficient for the management of these, but only it must be observed, that the larger Beans should be planted at a greater distance than the small ones; as also, that those which are first planted must be put closer together, to allow for some miscarrying; therefore where a single row is planted, the Beans may be put two inches asunder, and those of the third and fourth planting may be allowed three inches; and when they are planted in rows across a bank, the rows should be three feet asunder; but the *Windsor* Beans should have a foot more space between the rows, and the Beans in the rows should be planted five or six inches asunder. This distance may, by some persons, be thought too great; but from many years experience, I can affirm, that the same space of ground will produce a greater quantity of Beans, when planted at this distance, than if double the quantity of seeds are put on it. In the management of these later crops of Beans, the principal care should be to keep them clear from weeds, and other plants, which would draw away their nourishment; to keep earthing them up, and, when they are in blossom, to pinch off their tops, which, if suffered to grow, will draw the nourishment from the lower blossoms, which will prevent the pods from setting, and so only the upper parts of the stems will be fruitful; and another thing should be observed in planting of the succeeding crops, which is, to make choice of moist strong land for the later crops, for if they are planted on dry ground, they rarely come to much, unless the summer proves wet.

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These after crops should be planted at about a fortnight distance from *February* to the middle of *May*, after which time it is generally too late to plant, unless the land is very strong and moist; for in warm, dry, light land, all the late crops of Beans are generally attacked by the black insects, which cover all the upper part of their stems, and soon cause them to decay.

When the seeds of these Beans are designed to be sowed, a sufficient number of rows should be set apart for that purpose, according to the quantity desired; these should be managed in the same way as those which are designed for the table; but none of the Beans should be gathered, though there are some covetous persons, who will gather all the first ripe for the table, and are contented to save the after crop for seed, but these are never so large and fair as the first; so that if these are for sale, they will not bring near the price as the other, therefore what is gained to the table, is lost in the value of the seed; but those who are desirous to preserve the several varieties as pure as possible, should never suffer two of the varieties to grow for seeds in the same place, for by their farina mixing with each other, they will not continue so pure, but be apt to vary; but in order to keep the early kinds perfect, those which come the earliest should be sowed for seeds, which is what few people choose to do, because they are then the most valuable.

When the seed is ripe, the stalks should be pulled up, and set upright against a hedge to dry, observing to turn them every third day, that they may dry equally; then they may be threshed out and cleaned for use, or otherwise stacked up in a barn, till there is more leisure for threshing them out; and afterward the seed should be drawn over, to take out all those that are not fair, preserving the best for use or sale, and the ordinary beans will feed cattle.

It is a very good method to change the seeds of all sorts of Beans, and not to sow and save the seeds long in the same ground, for they do not succeed so well; therefore if the land is strong where they are to be planted, it will be the best way to procure the seeds from a lighter ground, and so *vice versa*; for by this method the crops will be larger, the Beans fairer, and not so liable to degenerate.

Having given directions for the culture of the Garden Beans, I shall next proceed to that of the Horse Bean, which is cultivated in the fields: there are two or three varieties of these Beans, which differ in their size and colour, but that which is now in the greatest esteem, is called the Tick Bean; this doth not grow so high as the other, is a more plentiful bearer, and succeeds better on light land than the common Horse Bean, so is preferred to it.

The Horse Bean delights in a strong moist soil and an open exposure, for they never thrive well on dry warm land, or in small inclosures, where they are very subject to blight, and are frequently attacked by a black insect, which the farmers call the black dolphin; these insects are often in such quantities, as to cover the stems of the Beans entirely, especially all the upper part of them; and whenever this happens, the Beans seldom come to good; but in the open fields, where the soil is strong and the plants have room, this rarely happens.

These Beans are usually sown on land which is fresh broken up, because they are of use to break and pulverize the ground, as also to destroy weeds; so that the land is rendered much better for Corn, after a crop of Beans, than it would have been before, especially if they are sown and managed according to the new husbandry, with a drill plough, and the horse hoe, used to stir the ground between the rows of Beans, which will prevent the growth of weeds, and pulverize the ground, whereby a much greater crop of Beans may, with more certainty, be expected, and the land will be better prepared for whatever crop it is designed for after.

The season for sowing of Beans is from the middle of *February* to the end of *March*, according to the nature of the soil; the strongest wet land should always be last sown; the usual quantity of Beans, sown on an acre of land, is about three bushels, but this is double the quantity that need be sown, especially according to the new husbandry; but I shall first set down the practice according to the old husbandry, and then give directions for their management according to the new. The method of sowing is after the plough, in the bottom of the furrows, but then the furrows should not be more than five, or, at most, six inches deep. If the land is new broken up, it is usual to plough it early in autumn, and let it lie in ridges till after *Christmas*; then plough it in small furrows, and lay the ground smooth; these two ploughings will break the ground fine enough for Beans, and the third ploughing is to sow the Beans when the furrows should be made shallow, as was before-mentioned.

Most people set their Beans too close; for, as some lay the Beans in the furrows after the plough, and others lay them before the plough and plough them in, so by both methods the Beans are set as close as the furrows are made, which is much too near; for when they are on strong good land, they generally are drawn up to a very great height, and are not so apt to pod as when they have more room, and are of a lower growth; therefore I am convinced by some late trials, that the better way is to make the furrows three feet asunder, or more, which will cause them to branch out into many stalks, and bear in greater plenty than when they are closer; by this method less than half the quantity of Beans will be sufficient for an acre of land, and the air being admitted between the rows, the Beans will ripen much earlier and more equally than in the common way.

What has been mentioned must be understood as relating to the old husbandry; but where Beans are planted according to the new, the ground should be four times ploughed before the Beans are set, which will break the clods, and render it much better for planting; then with a drill plough, to which a hopper is fixed for setting of the Beans, the drills should be made at three feet asunder, and the spring of the hopper set so as to scatter the Beans at three inches distance in the drills. By this method, less than one bushel of seed will plant an acre of land. When the Beans are up, if the ground is stirred between the rows with a horse plough, it will destroy all the young weeds; and when the Beans are advanced about three or four inches high, the ground should be again ploughed between the rows, and the earth laid up to the Beans; and if a third ploughing, at about five or six weeks after is given, the ground will be kept clean from weeds, and the Beans will stalk out, and produce a much greater crop than in the common way.

When the Beans are ripe, they are reaped with a hook, as is usually practised for Pease; and after having lain a few days on the ground they are turned, and this must be repeated several times, until they are dry enough to stack; but the best method is to tie them in small bundles, and set them upright; for then they will not be in so much danger to suffer by wet, as when they lie on the ground; and they will be more handy to carry and stack, than if they are loose. The common produce is from twenty to twenty-five bushels on an acre of land.

The Beans should lie in the mow to sweat, before they are threshed out; for as the haulm is very large and succulent, so it is very apt to give and grow moist; but there is no danger of the Beans receiving damage, if they are stacked tolerably dry, because the pods will preserve the Beans from injury; and they will be much easier to thresh after they have sweat in the mow, than before; and

after they have once sweated, and are dry again, they never after give.

By the new husbandry, the produce has exceeded the old by more than ten bushels on an acre; for if the Beans which are cultivated in the common method are observed when they are in pod, it will be found that more than half way of their stems have no Beans on them; for by standing close, they are drawn up very tall, so the tops of the stalks only produce, and all the lower part is naked; whereas in the new method, they bear almost to the ground; and as the joints of the stems are shorter, so the Beans grow closer together.

FABA ÆGYPTIACA. See Arum Ægyptiacum.

FABA CRASSA. See Anacampeferos, or Sedum.

FABAGO. See Zygophyllum.

FAGONIA. Tourn. Inst. R. H. 265. tab. 141. Lin. Gen. Plant. 475.

The Characters are,

The flower hath five heart-shaped petals, which spread open, and are narrow at their base, where they are inserted in the empalement; it hath ten erect stamina. In the center is situated a five-cornered germen, which afterward becomes a roundish capsule, having five lobes ending in a point, and five cells, each having a single roundish seed.

The Species are,

1. FAGONIA spinosa, foliolis lanceolatis planis lævibus. Hort. Upsal. 103. Thorny Trefoil of Candia.

2. FAGONIA inermis. Lin. Sp. Plant. 386. Spanish Fagonia without thorns.

3. FAGONIA spinosa, foliolis linearibus convexis. Lin. Sp. Plant. 386. Arabian Fagonia armed with very long spines.

The first sort is a native of the island of Candia, and has been described by some botanists under the title of *Trifolium spinosum Creticum*, which occasioned my giving it the English name of Thorny Trefoil of Crete; though there is no other affinity between this and the Trefoil, than that of this having three leaves or lobes on the same foot-stalk.

It is a low plant, which spreads its branches close to the ground, extending to the length of a foot or more every way, garnished with small trifoliate leaves placed opposite; at each joint, immediately below the leaves, come out two pair of spines, one on each side the stalk; and at the same places come out a single blue flower, standing upon a short foot-stalk, composed of five spear-shaped petals, which are narrow at their base, where they are inserted into the empalement; after these fall away the germen turns to a roundish five-lobed capsule, ending in an acute point, having five cells, each containing one roundish seed: it flowers in July and August, but unless the season proves warm the seeds do not ripen in England.

The second sort grows naturally in Spain; this differs from the first in being smooth, the branches of this having no thorns; and the plant will live two years, whereas the first is annual.

The third sort was discovered by the late Dr. Shaw in Arabia; this is a low plant with a shrubby stalk, from which come out several weak branches armed with long thorns; the leaves of this are thick, narrow, and convex on their lower side; the flowers come out in the same manner as in the first sort.

These plants are propagated by seeds, which should be sown upon a border of fresh light earth, where the plants are designed to remain; when the plants come up they may be thinned out to the distance of ten inches or a foot, and if they are kept clean from weeds they will require no other care.

The first and second sorts are annual plants, which do not perfect their seeds in England, unless the seasons prove very warm, therefore the best way is to sow their seeds upon a warm border in the autumn, and in frosty weather shelter

the plants with mats, or some other covering, to secure them; or if they are sown in pots, and placed under a frame in the winter, and the following spring shaken out of the pots, and planted in a warm border, they will come early to flower, and thereby ripe seeds may be more certainly obtained.

The other sort may be treated in the same way, for as the plants seldom flower the first year from seeds till the autumn, so the plants should be either kept in pots, or sheltered under a frame in winter, or placed in a warm border, where they may be sheltered with mats, or some other covering, to preserve them from the frost; and the following summer, it will flower and produce ripe seeds.

FAGOPYRUM. See Helxine.

FAGUS. Tourn. Inst. R. H. 584. tab. 351. The Beech tree.

The Characters are,

It hath male and female flowers on the same tree; the male flowers are collected into globular heads, and have no petals, but have several stamina included in an empalement of one leaf; the female flowers have a one-leaved empalement cut into four parts, but have no petals; the germen is fixed to the empalement, which afterward becomes a roundish capsule, armed with soft spines, opening in three cells, each containing a triangular nut.

We know but one Species of this genus, viz.

FAGUS. Dod. Pempt. 832. The Beech tree.

There are some planters, who suppose there are two distinct species of this tree; one they call the Mountain Beech, which they say is a whiter wood than the other, and they distinguish it by the title of Wild Beech; but it is certain, that this difference in the colour of the wood, arises from the difference of the soils in which they grow, for I have not seen any specific difference in the trees. There have been seeds of a Beech tree brought from North America, by the title of Broad-leaved Beech; but the plants which were raised from them proved to be the common sort, so that we know of no other variety, excepting that with striped leaves, which is accidental.

This tree is propagated by sowing the mast; the season for which is any time from October to February, only observing to secure the seeds from vermin when early sowed; which, if carefully done, the sooner they are sown the better, after they are fully ripe: a small spot of ground will be sufficient for raising a great number of these trees from seed, for if the plants come up very thick, the strongest of them should be drawn out the autumn following, that those left may have room to grow; so that a seed-bed carefully managed will afford a three years draught of young plants, which should be planted in a nursery; and, if designed for timber trees, at three feet distance, row from row, and eighteen inches asunder in the rows.

But if they are designed for hedges (to which the tree is very well adapted) the distance need not be so great; two feet row from row, and one foot in the rows will be sufficient. In this nursery they may remain two or three years, observing to dig up the ground between the roots, at least once a year, that their tender roots may the better extend themselves each way: but be careful not to cut or bruise their roots, which is injurious to all young trees; and never dig the ground in summer, when the earth is hot and dry, which, by letting in the rays of the sun to the roots, is often the destruction of young trees.

This tree will grow to a considerable stature, though the soil be stony and barren, as also upon the declivity of hills, and chalky mountains, where they will resist the winds better than most other trees; but then the nurseries for the young plants ought to be made upon the same soil, for if they are raised in good ground and a warm exposure, and afterwards transplanted into a bleak barren situation, they seldom

seldom thrive, which holds true in most other trees; therefore I would advise the nursery to be made upon the same soil where the plantation is intended, and to annually draw out plants to extend the plantation.

The tree is very proper to form large hedges to surround plantations, or wilderness quarters; and may be kept in a regular figure, if sheared twice a year, especially if they shoot strong; in which case, if they are neglected but a season or two, it will be difficult to reduce them again. The shade of this tree is very injurious to most sorts of plants which grow near it, but is generally believed to be very salubrious to human bodies.

The timber is of great use to turners for making trenchers, dishes, trays, buckets; and likewise to the joiner for stools, bedsteads, coffins, and is esteemed the best wood for firing, &c. The mast is very good to fat swine and deer, and also affords a sweet oil.

It delights in a chalky or stony ground, where it generally grows very fast; the bark of the trees in such land is clear and smooth, and although the timber is not so valuable as that of many other trees, yet as it will thrive on such soils, and in such situations where few better trees will grow, the planting of them should be encouraged, especially as the trees afford an agreeable shade, and the leaves make a fine appearance in summer, and continue green as long in autumn as any of the deciduous trees; therefore in parks, and other plantations for pleasure, this tree deserves to be cultivated among those of the first class, especially where the soil is adapted to it.

FEATHERFEW, or FEAVERFEW. See *Matricaria*.

FENNEL. See *Foeniculum*.

FENNEL-FLOWER. See *Nigella*.

FERRARIA. *Burm.*

The Characters are,

The flower is inclosed in a double spatha, or sheath, out of each sheath is produced one flower; the flower has six oblong acute-pointed petals, three of which are alternately larger than the other; these seem to be joined at their tails; their borders are fringed, turned backward, and silky; it has three stamina which rise above the petals, and a roundish three-cornered germen situated under the flower, which afterward turns to an oblong, smooth, three-cornered capsule, crowned by the decayed petals of the flower, with three cells, wrapped in the permanent sheath of the flower; in each cell is lodged many small round seeds.

The Species are,

1. *FERRARIA foliis lanceolatis*. *Burm.* Ferraria with spear-shaped leaves.

2. *FERRARIA foliis ensiformibus*. *Burm.* Ferraria with sword-shaped leaves.

These plants grow naturally at the Cape of Good Hope; the root of the first sort was sent me by Dr. Job Baster, F. R. S. of Zirkzee, who had received it from the Cape of Good Hope; the root is tuberous, roundish, and compressed, shaped like the root of Indian Corn Flag, but larger; in the center of the upper side of the root there is a hollow like a navel, from whence the flower-stalk comes out; the outer cover is of a light brown colour; the stalk rises a foot and a half high, as thick as a man's little finger, garnished with leaves the whole length, which are placed alternate, and embrace the stalks with their base; they are smooth, a little keel-shaped, and of a light green colour: the upper part of the stalk divides into two or three branches, garnished with leaves of the same shape with those below, but much shorter; each of the branches is terminated by a spatha or sheath, which is at first of the same colour with the leaves, but when the flower fades, this withers and dies, but remains upon the stalk; these sheaths are double one within the other. The flower rises out of the top upon a very short foot-stalk; it has six oblong petals, three of which are alter-

nately larger than the other, finely fringed on their edges, and are reflexed at their points; they are of a whitish green on their outside, but of a tawny Violet colour within, having many silky hairs on their surface. In the center of the flower is situated an erect style, which sits upon the germen, and is crowned with three bifid stigmas, which terminate in hairs. On one side the style is situated three stamina, which divide toward the top, and are terminated by roundish twin summits. The germen, which is situated under the flower, afterwards becomes an oblong smooth capsule with three cells, filled with roundish seeds.

There is a great singularity in the root of this plant, which is, that it vegetates but every other year, and sometimes every third year; the intermediate time it remains unactive, though very sound and good.

The second sort is figured by Dr. *Burman*, but I have not seen it as yet in *England*; it differs from the former in having longer leaves, which are sword-shaped and furrowed like those of *Byzantine Corn Flag*. The stalk rises about the same height, but does not divide so much; the flowers are smaller, and the petals are not so much fringed.

These plants are propagated by seeds, when they can be procured from the country where they naturally grow; these should be sown in pots as soon as they arrive, and require the same treatment as the *Ixia*. The roots also send out offsets, but it is sparingly in *England*, and these are some years before they arrive to a size for flowering, which occasions the scarcity of these plants in *Europe*. The roots also require the same culture with the *Ixia* and *Watsonia*, for they are too tender to live through the winter in the open air here, so must be planted in pots filled with light loamy earth, and sheltered under a frame in winter in the same manner as hath been before directed for *Watsonia* and *Ixia*, under which articles the reader will find proper directions for their culture and management; but those years when these roots do not vegetate they should have very little water, and in the summer the pots should be placed where they may have only the morning sun, for if they are exposed to the mid-day sun, the earth will dry too much, so may require water often, which frequently rots the roots when they are in an inactive state.

The mice are very fond of these roots, therefore they should be protected from those vermin, otherwise they will destroy them.

FERRUM EQUINUM. See *Hippocrepis*.

FERULA. *Lin. Gen. Plant.* 305. Fennel Giant.

The Characters are,

It hath an umbellated flower; the principal umbel is composed of several smaller called rays; the involucre is composed of several narrow leaves, which fall off; the principal umbel is uniform. The flowers have five oblong petals, and five stamina of the same length; under the flower is situated a turbinated germen, which afterward becomes an elliptical, compressed, plain fruit, dividing in two parts, each having a large, elliptical, plain seed.

The Species are,

1. *FERULA foliolis linearibus longissimis simplicibus*. *Hort. Cliff.* 95. *Pliny's Female Fennel Giant*.

2. *FERULA foliolis multipartitis, laciniis linearibus planis*. *Hort. Cliff.* 95. Galbanum-bearing Fennel Giant of *Lobel*.

3. *FERULA foliolis laciniatis, lacinulis tridentatis inaequalibus*. *Hort. Cliff.* 95. Broad-leaved shining Fennel Giant from *Tangier*.

4. *FERULA foliis pinnatifidis, pinnis linearibus planis trifidis*. *Hort. Cliff.* 95. Fennel Giant with a broader leaf.

5. *FERULA foliorum pinnis basi nudis, foliolis setaceis*. *Hort. Cliff.* 95. Eastern Fennel Giant, with the leaf and appearance of *Cachrys*.

6. *FERULA foliorum pinnis utrinque basi acutis, foliolis setaceis. Hort. Cliff. 95.* Eastern Lasciwort, with a Spignel leaf and yellow flower of *Tournefort*.

7. *FERULA foliolis appendiculatis, umbellis subsessilibus. Lin. Sp. Plant. 247.* Libanotis, with a Fennel Giant leaf and feed.

8. *FERULA foliis pinnatifidis, pinnis linearibus planis brevioribus.* Fennel Giant, with a narrower leaf of *Tournefort*.

The first of these plants is pretty common in the *English* gardens: this, if planted in a good soil, will grow to the height of ten or twelve feet, and divide into many branches: the lower leaves of this sort spread more than two feet every way, which are subdivided into many small ones, garnished with very long, narrow, small leaves, of a lucid green. From the center of the plant comes out the flower-stalk, which, when the plants are strong, will be near as large as a common broomstick, and will rise ten or twelve feet high, with many joints; if the stalks are cut, there issues from the vessels a foetid yellowish liquor, which will concrete on the surface of the wound. The stalks are terminated by large umbels of yellow flowers, which come out the latter end of *June*, or in the beginning of *July*, which are succeeded by oval compressed seeds, having three lines running longitudinally on each side. These ripen in *September*, and the stalks decay soon after.

The second sort doth not grow quite so large as the first, but the stalks of this will rise seven or eight feet high; the lower leaves are large, and greatly divided; the small leaves are flat and not so long as those of the former, and are of a lucid green colour; the umbels of flowers are smaller, and the seeds are less.

The third sort hath large spreading leaves near the root, which are divided and subdivided into many parts; the small leaves of this are much broader than in any of the other sorts, and are divided at their end into three unequal segments. The stalks are strong, and rise to the height of eight or ten feet, terminated by large umbels of yellow flowers, which are succeeded by large, oval, compressed seeds, like those of the first sort. This flowers and ripens its seeds about the same time as the former sort: it grows naturally in *Spain* and *Barbary*.

The fourth sort grows to much the same height as the second; the smaller lobes or divisions of the leaves are broader than those of the others (excepting the third), but they are longer than those, and of a darker green colour, ending in three points. The umbels of flowers are large, the flowers are yellow, and are succeeded by oval compressed seeds, like those of the other species. This grows naturally in *Sicily*.

The fifth sort is of much humbler growth than either of the former; the stalks of this seldom rise much more than three feet high; the lower leaves branch into many narrow brittle divisions; the umbel of flowers is small, when compared with the others, as are also the seeds. It grows naturally in the *Levant*.

The sixth sort hath very branching leaves, the foot-stalks are angular and channelled; this sends out at every joint two side branches opposite; those toward the bottom are nine or ten inches long, and the others are diminished gradually to the top, garnished with very fine leaves like those of Spignel, which stand round the stalks in shape of whorls; the flower-stalks grow three feet high, with a pretty large umbel of yellow flowers at the top, which are succeeded by oval flat seeds. It grows naturally in the *Levant*.

The seventh sort rises about three feet high; the leaves of this sort are much divided, and the small leaves on the divisions are narrow and entire; the umbels of flowers are small, and situated close to the stalks between

the leaves at the joints; these are like those of the other sorts. It grows naturally in *Istria* and *Carniola*.

The eighth sort is like the second, but the small leaves are much broader; the large leaves are not so long, and the stalk grows taller, but in other respects agrees with that. It grows naturally in *Spain*.

All these sorts have perennial roots, which will continue several years, and run deep in the ground: the stalks are annual, and decay soon after they have perfected their feeds. As these plants spread very wide, so they should have each four or five feet room; nor should they stand near to other plants, for their roots will rob whatever plants grow near them of their nourishment.

They are all propagated by seeds, which should be sown in the autumn; for if they are kept out of the ground till the spring, they frequently fail, and those which succeed remain a year in the ground, so that much time is lost. The seeds may be sown in drills, by which method the ground may be easier kept clean; the drills must not be nearer than a foot, and the seeds may be scattered two or three inches asunder in the drills. When the plants come up, if they should be too close together, they should be thinned, to allow them room to grow, for they will not be strong enough to remove till they have had two years growth; then in the autumn so soon as their leaves decay, the roots should be taken up with great care, so as not to cut or injure the tap or downright root, and planted in the places where they are designed to remain, for after this transplanting they should not be removed. They delight in a soft, gentle, loamy soil, not too wet, and are very rarely injured by the hardest frost.

FICOIDES. See *Mesembryanthemum*.

FICUS. *Lin. Gen. Pl. 1032.* The Fig Tree.

The Characters are,

It hath male and female flowers, which are included within the skin of the fruit, so do not appear unless the covering is opened; the male flowers are but few in number, and are situated in the upper part of the fruit; the female flowers are numerous, situated in the lower part. The male flowers sit each upon a separate foot-stalk; they have no petals, but three bristly stamina; the female flowers sit upon distinct foot-stalks; they have no petals, but a germen, which afterward becomes a large seed, sitting in the empalement.

The Species are,

1. *FICUS foliis palmatis. Hort. Cliff. 471.* Fig Tree with hand-shaped leaves; or, the common Fig Tree.

2. *FICUS foliis cordatis subrotundis integerrimis. Hort. Cliff. 471.* Fig Tree with a Mulberry leaf, bearing fruit on the body or stem, commonly called Sycamore.

3. *FICUS foliis cordatis integerrimis acuminatis. Hort. Cliff. 471.* Malabar Fig with a long-pointed leaf, and small, double, round fruit.

4. *FICUS foliis ovatis integerrimis obtusis, caule inferè radicato. Hort. Cliff. 471.* Bengal Fig, with a roundish leaf and orbicular fruit.

5. *FICUS foliis lanceolatis petiolatis, pedunculis aggregatis, ramis radicanibus. Lin. Sp. Plant. 1060.* Indian Fig of *Theophrastus*.

6. *FICUS foliis lanceolatis integerrimis. Hort. Cliff. 471.* The largest Indian Fig, with an oblong leaf, sending out roots from the tops of the branches, and a small, spherical, blood-coloured fruit.

7. *FICUS foliis ovatis acutis integerrimis, caule arboreo, fructu racemoso. Lin. Sp. Plant. 1060.* Fig Tree with oval, entire, acute leaves, a tree-like stalk, and fruit growing in bunches.

8. *FICUS foliis ovatis acutis integerrimis, caule repente. Lin. Sp. Pl. 1060.* Trailing wild Fig Tree, having single leaves.

9. *Ficus foliis ovato-cordatis integerrimis glabris.* Fig Tree with oval, heart-shaped, entire, smooth leaves, vulgarly called Fig Tree with a Water Lily leaf.

10. *Ficus foliis oblongo-cordatis acuminatis, petiolis longis. fomis.* Fig Tree with a Citron leaf, and small purple fruit.

The first sort, which is the only Fig whose fruit is valuable, is cultivated in most parts of *Europe*; of this there are great varieties in the warm countries. In *England* we had not more than four or five sorts till within a few years past, for as the generality of the *English* were not lovers of this fruit, so there were few who troubled themselves with the culture of it. But some years past I had a large collection of these trees sent me from *Venice*, by my honoured friend the Chevalier *Rathgeb*, all which I planted and preserved to taste of their fruits; several of them proved excellent, these I have preserved and propagated, and those whose fruit were inferior, have been neglected. As the variety of them is very great, so I shall here mention only such of them as are the best worth cultivating, placing them in the order of their ripening.

1. The Brown and Chestnut-coloured *Ischia* Fig, is the largest fruit of any I have yet seen; it is of a globular figure, with a large eye, pinched in near the foot-stalk, of a brown or Chestnut colour on the outside, and a purple within; the grains are large, the pulp sweet and high flavoured: this sort very often bursts open when it ripens, which is the latter end of *July*, or the beginning of *August*. I have had this fruit ripen well on standards, in a warm soil. If this sort is planted against hot walls, two plentiful crops of fruit may be annually ripened; for against a south-east wall, many of the second crop do annually ripen without art.

2. The Black *Genoa* Fig. This is a long fruit, which swells pretty large at the top where it is obtuse, but is very slender toward the stalk; the skin is of a dark purple colour, almost black, and hath a purple farina over it like that on some *Plumbs*; the inside is of a bright red, and the flesh is very high flavoured. It ripens early in *August*.

3. The small, white, early Fig. This hath a roundish fruit a little flatted at the crown, with a very short foot-stalk; the skin, when fully ripe, is of a pale yellowish white colour; is thin, the inside white, and the flesh very sweet, but not high-flavoured. This ripens in *August*.

4. The large white *Genoa* Fig. This is a large globular fruit, a little lengthened toward the stalk; the skin is thin, of a yellowish colour when fully ripe, and red within. It is a good fruit, but the trees are not good bearers.

5. The Black *Ischia* Fig. This is a short fruit, of a middling size, a little flatted at the crown; the skin is black when ripe, and the inside is of a deep red; the flesh is very high flavoured, and the trees produce a good crop of fruit, but the birds are great devourers of them, if they are not protected from them. This ripens in *August*.

6. The *Malta* Fig. This is a small brown fruit, much compressed at the top, and greatly pinched toward the foot-stalk; the skin is of a pale brown colour, as is also the inside; the flesh is very sweet, and well flavoured. If this sort is permitted to hang upon the trees till the fruit is shrivelled, it becomes a fine sweatmeat.

7. The Murrey, or Brown *Naples* Fig. This is a pretty large globular fruit, of a light brown colour on the outside, with some faint marks of a dirty white; the inside is nearly of the same colour, the grains are pretty large, and the flesh is well flavoured. It ripens the latter end of *August*, but is a bad bearer.

8. The Green *Ischia* Fig. This is an oblong fruit, almost globular at the crown; the skin is thin, of a green colour, but when it is fully ripe, it is stained through by the pulp to a brownish cast; the inside is purple, and will stain linen

or paper; the flesh is well flavoured, especially in warm seasons. It ripens toward the end of *August*.

9. The *Madonna* Fig, commonly called here the *Brunswick*, or *Hanover* Fig, is a long pyramidal fruit of a large size; the skin is brown; the flesh is of a lighter brown colour, coarse, and hath little flavour. This ripens the end of *August* and the beginning of *September*; the leaves of this sort are much more divided than of most other.

10. The common Blue, or Purple Fig, is so well known, as to need no description.

11. The long Brown *Naples* Fig. The leaves of this tree are deeply divided. This fruit is long, somewhat compressed at the crown. The foot-stalks are pretty long; the skin of a dark brown when fully ripe, the flesh inclining to red; the grains are large, and the flesh well flavoured. It ripens in *September*.

12. The *Gentile* Fig. This is a middle-sized oval fruit; the skin, when ripe, is yellow, the flesh also inclines to the same colour; the grains are large, and the flesh is well flavoured, but it ripens very late, and the trees are bad bearers, so that it is not propagated much in *England*.

The first, second, third, ninth, and tenth sorts, will ripen their fruits on standards, where they are in a warm situation; but the others require the assistance of walls exposed to good aspects, otherwise their fruit will not ripen well in *England*.

Fig trees generally thrive in all soils and in every situation, but they produce a greater quantity of fruit upon a strong loamy soil, than on dry ground; for if the season proves dry in *May* and *June*, those trees which grow upon very warm dry ground, are very subject to cast their fruit; therefore, whenever this happens, such trees should be well watered and mulched, which will prevent the fruit from dropping off; but the fruit upon these trees are better flavoured, than any of those which grow upon cold moist land. I have always observed those Fig trees to bear the greatest quantity of well flavoured fruit, which were growing upon chalky land, where there has been a foot or more of a gentle loamy soil on the top. They also love a free open air, for although they will shoot and thrive very well in close places, yet they seldom produce any fruit in such situations; and all those which are planted in small gardens in *London*, will be well furnished with leaves, but I have never seen any fruit upon them, which have grown to maturity.

These trees are always planted as standards, in all warm countries, but in *England* they are generally planted against walls, there being but few standard Fig trees at present, in the *English* gardens; however, since some of the sorts are found to ripen their fruit well upon standards, and the crop of Figs is often greater upon them, than upon those trees against walls, it is worthy of our care, to plant them either in standards or espaliers; the latter, I think, will succeed best in *England*, if they were managed as in *Germany*, where they untie the Fig trees from the espalier, and lay them down, covering them in winter with straw or litter, which prevents their shoots being injured by the frost; and this covering is taken away gradually in the spring, and not wholly removed until all the danger of frost is over, by which they generally have a very great crop of Figs; whereas in *England*, where the trees grow in warm situations, if the spring proves warm, the young Figs are pushed out early, and the cold, which frequently returns in *May*, causes the greatest part of the fruit to drop off; so that our crop of Figs is generally more uncertain, than most other sorts of fruit; and it frequently happens, that trees which are planted against north and east aspected walls, produce a greater quantity of fruit in *England*, than those which are planted against south and south east aspects; which must happen, from the latter putting out their fruit so much earlier in the spring than the former;

former; and if there happen cold frosty nights, after the Figs are come out (which is frequently the case in this country), the forwardest of the Figs are generally so injured as to drop off from the trees soon after. In *Italy*, and the other warm countries, this first crop of Figs is little regarded, being few in number; for it is the second crop of Figs which are produced from the shoots of the same year, which is their principal crop, but these rarely ripen in *England*, nor are there above three or four sorts which ever ripen their second crop, let the summer prove ever so good, unless they have hot walls, therefore it is the first crop which we must attend to in *England*; so that when these trees are growing against the best aspectted walls, it will be a good method to loosen them from the wall in autumn; and after having divested the branches of all the latter fruit, to lay the branches down from the wall, fastening them together in small bundles, so that they may be tied to stakes, to keep them from lying upon the ground, the damp whereof, when covered in frosty weather, might cause them to grow mouldy; this will secure the branches from being broken by the wind. When they are thus managed in autumn, if the winter should prove very severe, the branches may be easily covered with Pease haulm, Straw, or any other light covering, which will guard the tender fruit-bearing branches from the injury of frost; and when the weather is mild, the covering must be removed, otherwise the Figs will come out too early; for the intention of this management is, to keep them as backward as possible; then in the spring, when the Figs begin to push out, the trees may be fastened to the wall again. By this management, I have seen very great crops of Figs produced in two or three places.

I have also seen great crops of Figs in some particular gardens, after very sharp winters, when they have, in general, failed in other places, by covering up the trees with Reeds made into pannels, and fixed up against the walls.

In the pruning of Fig trees, the branches must never be shortened, because the fruit are all produced at the upper part of the shoots of the former year, so, if these are cut off, there can be no fruit expected, beside the branches are very apt to die after the knife; so that when the branches are too close together, the best way is to cut out all the naked branches quite to the bottom, leaving those which are best furnished with lateral branches at a proper distance from each other, which should not be nearer than a foot; when they are well furnished with lateral branches, if they are laid four or five inches farther asunder, it will be better.

The best time for pruning of Fig trees is in autumn, because at that time the branches are not so full of sap, so they will not bleed so much, as when they are pruned in the spring; and at this season, the branches should be divested of all the autumnal Figs; and if the bud at the extremity of the shoots are rubbed off with the finger, it will cause them to put out a greater crop of fruit in the spring; the sooner this is done, when the leaves do begin to fall off, the better will the young shoots resist the cold of the winter. There are some seasons so cold and moist, that the young shoots of the Fig trees will not harden, but are soft, and full of juice; when this happens, there is little hope of a crop of Figs the succeeding year, for the first frost in autumn will kill the upper part of these shoots. Whenever this happens, it is the best way to cut off all the decayed part of the shoots, which will prevent the infection from spreading to the lower part of the branches.

Those trees which are laid down from the espaliers, should not be fastened up again till the end of *March*, for the reasons before given, and those against walls may remain some time longer; when the large shoots of these are nailed up, if the small lateral branches are thrust behind them to keep them close to the wall, it will secure the

young Figs from being injured by the morning frosts, and when this danger is over, they may be brought forward to their natural position again; during the summer season these trees will require no other pruning, but to stop the shoots in the spring, where lateral branches are wanting; and as the branches are often blown down by wind, therefore, whenever this happens, they should be immediately fastened up again, otherwise they will be in danger of breaking, for the leaves of these trees being very large and stiff, the wind has great power on them, so that where the branches are not well secured, they are frequently torn down.

Those trees which are planted against espaliers, which are not laid down as before directed, may be protected from the injury of frost in the winter, by placing Reeds on each side the espalier, which may be taken down every day, and put up again at night; but this need not be practised in warm weather, but only at such times as there are cold winds, and frosty mornings; and although there is some trouble and expence attending this management, yet the plentiful crop of Figs, which may be this way obtained, will sufficiently recompense for both: the best way of making this covering is, to fasten the Reeds with rope yarn, in such a manner, as that it may be rolled up like a mat, so that the whole may with great facility be put up, or taken down; and if these Reeds are carefully rolled up, after the season for using them is over, and put up in a dry shed, they will last several years.

I am aware, that what I have here advanced, in relation to the pruning and dressing of Fig trees, will be condemned by great numbers of people, who will not give themselves time to consider and examine the reasons upon which I have founded this practice, nor to make one single experiment to try the truth of it, as being vastly different from the general practice of most gardeners, who always imagine, that Fig trees should never have any pruning, or, at least, that they should always be suffered to grow very rude from the wall, to some distance. By this management I have often seen great quantities of fruit, I cannot deny, but then this has been only after mild winters; for it is very certain, that in sharp frosts few of these outside shoots escape being greatly injured where they are not covered; whereas it rarely happens, that those shoots which are closely fastened to the wall in autumn, or laid down and covered, suffer the least damage, and the fruit are always produced a fortnight sooner upon these branches, than they are upon those which grow from the wall; but although the trees which are suffered to grow rude from the walls may produce a good quantity of fruit for a year or two, yet afterward the trees will only bear at the ends of the shoots, which will then be so far from the wall, as to receive little benefit from it, nor can the trees be reduced again to any regularity, without cutting away the greatest number of their branches, by which a year or two will be lost, before they will come to bear again.

The season also for pruning, which I have laid down, being vastly different from the common practice and opinion of most gardeners, may also be objected to; but I am sure, if any one will but make trial of it, I doubt not his experience will confirm what I have here advanced; for as one great injury to this tree proceeds from the too great effusion of sap at the wounded parts, so by this autumn pruning this is prevented; for, at that season, all the parts of *European* trees, which cast their leaves, are less replete with moisture than at any other time of the year, for by the long continuance of the summer's heat, the juices of plants having been exhausted in the nourishment and augmentation of wood, leaves, fruits, &c. and also great quantities being evaporated by perspiration, the root not being able to send up a supply equivalent to this great consumption, the

branches must contain a much less quantity of sap in autumn than in spring, when it has had several months supply from the root, which though but small in proportion to what is sent up when the heat is greater, yet there being little or no waste, either by perspiration or augmentation, there must be a greater quantity contained in the branches; which also is easily to be observed, by breaking or cutting off a vigorous branch of a Fig tree at both seasons (the sap, being milky, may be readily discerned;) when that cut in autumn shall be found to stop its bleeding in one day's time, or less, whereas that cut in the spring will often flow a week or more, and the wound will be proportionably longer before it heals.

Of late years there has been some of these trees planted against fire walls, which have succeeded very well where they have been properly managed, but where they have been kept too close, and drawn by glasses, they have not produced much fruit; therefore whenever this is practised, the heat should not be too great, nor the glasses, or other covering, kept too close, but at all times, when the weather is favourable, a good share of free air should be admitted; and if the trees are young, that their roots are not extended beyond the reach of the covering, they must be frequently watered when they begin to shew fruit, otherwise it will drop off; but old trees, whose roots are extended to a great distance, will only require to have their branches now and then sprinkled over with water. If these trees are properly managed, the first crop of fruit will be greater than upon those which are exposed to the open air, and will ripen six weeks or two months earlier, and a plentiful second crop may also be obtained, which will ripen early in *September*, and sometimes in *August*, which is about the season of their ripening in the warmer parts of *Europe*; but the fires should not be used to these trees till the beginning of *February*, because when they are forced too early, the weather is frequently too cold to admit a sufficient quantity of fresh air to set the fruit, but the covers should be put over the trees two months before, to prevent the shoots from being injured by the frost.

Fig trees are propagated in *England*, either by the suckers, which are sent out from their roots, and by layers made by laying down of their branches, which in one year will put out roots sufficient to be removed, or by planting of cuttings, which, if properly managed, will take root; the first of these is a bad method, because all those trees which are raised from suckers, are very subject to send out great quantities of suckers again from the roots. Those plants which are propagated by layers, are the best, provided the layers are made from the branches of fruitful trees, for those which are made from the suckers, or shoots, produced from old stools, have very soft branches, full of sap, so are in danger of suffering by the frost, and these will shoot greatly into wood, but will not be very fruitful; for, when the trees have acquired a vicious habit while young, it is seldom they are ever brought to be fruitful afterward; therefore the shoots that are laid down, should be such as are woody, compact, and well ripened, not young shoots full of sap, whose vessels are large and open. The best time for laying down of the branches is in autumn; if the winter should prove very severe, if they are covered with some old tan, or any other mulch, to keep the frost from penetrating of the ground, it will be of great service to them; by the autumn following, these will be sufficiently rooted for removing, when they should be cut off from the old plants, and transplanted where they are to remain. As these plants do not bear transplanting well when they are large, so it is the better way to plant them at first in the places where they are to remain, and after they are planted, the surface of the ground about their roots, should be

covered with mulch to keep out the frost, if the winter should prove very severe; and if the branches are covered with Reeds, Pease haulm, Straw, or some other light covering, it will prevent their tender ends being killed by the frost, which frequently happens where this care is wanting.

If fruitful branches of these trees are cut off, and planted in pots, or tubs filled with good earth, and plunged into a good hot-bed of tanners bark in the stove, they will put out fruit early in the spring, which will ripen the middle of *May*.

We shall now return to the other sorts of Figs, which grow naturally in warm countries, but are preserved in the gardens of those who are curious in collecting of rare exotick plants, for these do not bear eatable fruit in their native soil, but their leaves being large and beautiful, the plants make a pleasing variety in the stove.

The second sort grows naturally in the *Levant*, where it becomes a large tree, dividing into many branches, garnished with leaves shaped like those of the Mulberry, so affords a friendly shade in those hot countries. The fruit is produced from the trunk and large branches of the tree, and not on the smaller shoots, as in most other trees; the shape is like the common Fig, but is little esteemed. This is called the Sycamore, or *Pharaoh's Fig tree*.

The third sort grows naturally in *India*, where the trees are sacred, so that none dare destroy them, it is called by some the *Indian God tree*. It rises with a woody stem to a great height, sending out many slender branches, which are garnished with smooth heart-shaped leaves, somewhat like those of our Black Poplar, ending in a long tail, or point; they are entire, smooth, and of a light green, having pretty long foot-stalks. The fruit comes out on the branches, which are small, round, and of no value.

The fourth sort rises with many stalks, which grow to the height of thirty or forty feet, dividing into a great number of branches, which send out roots from their under side, many of which reach to the ground; so that in such places where these trees grow naturally, their roots and branches are so interwoven with each other, as to render the places impassable. In *India*, the *Banyans* trail the branches of these trees into regular archades, and set up their pagods under them, these being the places of their devotion. In *America*, where these trees are equally plenty, they form such thickets, as neither man or beast can pass through. The leaves of this sort are of a thick substance, smooth, and oval; six inches long, and four broad, with obtuse ends. The fruit is the size of a marble, round, but of no use.

The fifth sort grows naturally in both *Indies*; this rises with a woody stalk, to the height of thirty feet, sending out many branches, garnished with oblong leaves, standing upon long foot-stalks; they are about six inches long, and two broad, ending in an obtuse point, of a dark green, smooth on their upper side, but of a light green, and veined on their under side. The fruit is small, of no value. The branches of these trees send out roots from their lower side, which sometimes reach the ground.

The sixth sort grows naturally in the *West-Indies*, where it rises to the height of thirty or forty feet, sending out many slender branches, which put out roots in the same manner as the former. The leaves of this are eight or nine inches long, and two broad, ending in points. The fruit is small, round, of a blood colour when ripe, but is not eatable.

The seventh sort grows naturally in *India*, where it rises to the height of twenty-five feet, divides into many branches, garnished with oval-pointed smooth leaves, of a lucid green. The fruit is small, and grows in clusters from the side of the branches, but are not eatable.

The eighth sort grows naturally in *India*; this is a low trailing shrub, whose stalks put out roots at their joints, which strike into the ground, so is propagated plentifully where it naturally grows. The leaves are two inches and a half long, and two broad, ending in points; they are of a lucid green; the fruit is small, and not eatable.

The ninth sort rises with a strong, upright, woody stalk, twenty feet high, sending out several side branches, garnished with large, oval, stiff leaves, about fourteen inches long, and a foot broad, rounded at the ends, and indented at the foot stalk; the upper side of the leaves are of a lucid green, the under side is of a gray, or sea-green colour, of a thick substance, and very smooth; this grows naturally in *India*.

The tenth sort grows naturally in the *West-Indies*, where it rises twenty feet high, sending out many side branches, which are covered with a white bark, garnished with oblong heart-shaped leaves, ending in acute points; of a lucid green on their upper side, but of a pale green on their under, standing upon very long foot-stalks. The fruit comes out from the side of the branches, toward their ends; they are about the size of large gray Pease, of a deep purple colour, sitting close to the branches, but are not eatable.

The second sort, I believe, is not in *England* at present. I raised two or three of these plants from seeds in the year 1736, which were destroyed by the severe frost in 1740, since which time I have not been able to procure any of the seeds. The other sorts are preserved in several curious gardens; they are easily propagated by cuttings during the summer season. When the cuttings are taken from the plants, they should be laid in a dry shady place for two or three days, that the wounds may be healed over, otherwise they are apt to rot; for all these plants abound with a milky juice, which flows out whenever they are wounded, for which reason the cuttings should have their wounded part healed over and hardened before they are planted; after which they should be planted in pots filled with sandy light earth, and plunged into a moderate hot-bed, where they should be shaded from the sun, and two or three times a week gently refreshed with water, if the season is warm, but they must not have too much moisture, for that will infallibly destroy them. When the cuttings have taken root sufficient to transplant, they should be each planted into a separate small pot filled with light undunged earth, and plunged into the hot-bed again, being careful to shade them until they have taken fresh root; then they should have a large share of free air admitted to them at all times, when the weather is favourable, to prevent their drawing up weak, and to give them strength before the cold comes on. In autumn the pots should be removed into the stove, and plunged into the tan-bed, where they should constantly remain, and must be treated in the same manner as other tender plants from the same countries; for although two or three sorts may be treated in a hardier manner, yet they will not make much progress.

FICUS INDICA. See Opuntia.

FILBERT. See Corylus.

FILIPENDULA. See Spiræa.

FIR TREE. See Abies.

FLOS AFRICANUS. See Tagetes.

FLOS PASSIONIS. See Passiflora.

FLOS SOLIS. See Helianthus.

FLOS TRINITATIS. See Viola.

FLOWER. A flower is a natural production which precedes the fruit, that includes the grain or seed. Though a flower is a thing so well known, yet the definition of this part of a plant is as various almost as the authors who define it. *Jungius* defines it to be the more tender part of a plant, remarkable for its colour, or form, or both, cohering with the fruit. Yet this author himself confesses,

that this definition is too narrow; for some of those bodies which he allows to be flowers, are remote from the fruit.

A flower may be thus defined, *viz.* it contains the organs of generation of both sexes adhering to a common placenta, together with their common coverings; or of either sex separately, with its proper coverings, if it have any.

FOENICULUM. *Tourn. Inst. R. H. 311. tab. 164.* Fennel.

The Characters are,

It hath an umbellated flower; the great umbel is composed of many smaller, which have no involucre; the flowers have five incurved petals, and five stamina; the germen is situated under the flower, which afterward turns to an oblong fruit, deeply channelled, dividing into two parts, each containing a single seed.

The Species are,

1. FOENICULUM foliis decompositis, foliolis brevioribus multifidis, semine brevior. Common Fennel.

2. FOENICULUM foliis decompositis, foliolis longioribus, semine longiori. Sweet Fennel having a larger white seed.

3. FOENICULUM humilius, radice caulescente carnosio, seminibus recurvis. radice annua. Sweet Azorian Fennel, called *Finocchio*.

The first sort is the common Fennel which is cultivated in the gardens, and has sown itself in many places, where it has been introduced in such plenty, as to appear as if it were a native in *England*; but it is no where found at a great distance from gardens, so has been undoubtedly brought from abroad. There are two varieties of this, one with light green, the other with very dark leaves, but these I believe are only varieties which arise from the same seeds.

The common Fennel is so well known, as to need no description. It has a strong fleshy root which penetrates deep into the ground, and will continue several years. It flowers in *July*, and the seeds ripen in autumn. The best time to sow the seeds, is soon after they are ripe; the plants will come up in the spring, and require no other care but to keep them clean from weeds; it will grow in any soil or situation. The leaves, seeds, and roots of this are used in medicine; the root is one of the five opening roots, and the seed one of the greater carminative seeds. There is a simple water made from the leaves, and a distilled oil from the seed.

The sweet Fennel has been by many supposed only a variety of the common sort, but I have cultivated it in the same ground with that, where it has retained its differences. The leaves of this are very long and slender, growing more sparsely, and do not end in so many points as those of the common sort; the stalks do not rise so high; the seeds are longer, narrower, and of a lighter colour. These seeds are generally imported from *Germany* or *Italy*, and are by some preferred to those of the common sort for use, being much sweeter.

This may be propagated in the same manner as the former sort, being very hardy, but the roots are not of so long duration.

The third sort is supposed to have been originally brought from the *Azorian Islands*; it has been long cultivated in *Italy* as a salad herb, under the title of *Finocchio*; and there are some few gardens in *England*, where it is now cultivated in small quantities, for there are not many *English* palates which relish it, nor is it easy to be furnished with good seeds; those which are annually brought from *Italy*, seldom prove good, and it is difficult to save it in *England*, because the winter frequently kills those plants which are left for seeds; and when any good plants of the early sowing are left for seeds, they do not ripen, unless the autumn proves very favourable.

This sort hath very short stalks, which swell just above the surface of the ground, to four or five inches in breadth, and

and almost two thick, being fleshy and tender : this is the part which is eaten when blanched, with oil, vinegar, and pepper, as a cold salad. When these plants are permitted to run for seeds, the stalks do not rise more than a foot and a half high, having a large spreading umbel standing on the top. The seeds of this sort are narrow, crooked, and of a bright yellow colour ; they have a very strong smell like Aniseed, and are very sweet to the taste.

The manner of cultivating this plant is as follows : The first care is to procure some good seeds from some person who has been careful in the choice of the plants, otherwise there will be little hope of having it good : then make choice of a good spot of light rich earth, not dry nor very wet, for in either extreme this plant will not thrive. The first crop may be sown about a fortnight in *March*, which, if it succeeds, will be fit for use in *July* ; and so by sowing at several times, there may be a supply for the table till frost puts a stop to it. After having well dug and levelled the ground smooth, the seed should be sown in a shallow rill by a line, scattering them pretty thin, for the plants must be left six inches asunder in the rows ; but however, some of the seeds may fail, therefore they should be scattered two inches distance, then cover the seeds about half an inch thick with earth, laying it smooth : these rills should be made eighteen inches asunder, or more, that there may be room to clean the ground, as also to earth up the plants when they are full grown. When the plants come up, which will be in about three weeks or a month after sowing, all the weeds between them must be cut up, and where the plants are too close, they should be thinned to about four inches distance ; and as they advance, and the weeds spring again, they should, from time to time, be hoed ; and at the last time of thinning them they should be left seven or eight inches asunder at least. If the kind be good, the stems of the plants will increase to a considerable bulk just above the surface of the ground ; which part should be earthed up in the manner of Celery, to blanch, about a fortnight or three weeks before it is used, which will cause it to be very tender and crisp.

The second crop should be sown about three weeks after the first, and so continued every three weeks or a month till the end of *July*, after which time it will be too late for the plants to come to any perfection. But the seeds which are sown in *May* and *June*, should have a moister soil than that which you sowed the first ; as also what is sown the latter part of *July*, should be on a drier soil, and in a warmer situation ; because this crop will not be fit for use till late in autumn, and therefore will be subject to injuries from too much wet or cold, if on a moist soil. If the season should prove dry, the plants must be watered, otherwise they will run up to seed before they are of any size ; therefore there should be a channel made where every row of plants grow, to detain the water which is poured on them, to prevent its running off. In the autumn, if there should happen sharp frosts, it will be very proper to cover the plants with some Pease haulm, or other light covering, to prevent their being pinched, by which method they may be continued for use till the middle of winter.

FOENUM BURGUNDIACUM. See *Medica Sativa*.

FOENUM GRÆCUM. See *Trigonella*.

FRAGARIA. *Lin. Gen. Plant.* 558. The Strawberry.

The Characters are,

The flower hath five roundish petals, which are inserted in the empalement, and twenty stamina, with a great number of germen collected into a head, which afterward becomes a large, soft, pulpy fruit, leaving many small angular seeds in the empalement.

The Species are,

1. FRAGARIA foliis ovatis serratis, calycibus brevibus, fructu parvo. The common, or Wood Strawberry.

2. FRAGARIA foliis oblongo-ovatis serratis, inferne incantis, calycibus longioribus, fructu subrotundo. *Virginia* Strawberry with a scarlet fruit, commonly called the Scarlet Strawberry.

3. FRAGARIA foliis ovato-lanceolatis rugosis, fructu ovato. Strawberry with fruit as large as a small Plum, commonly called Hautboy Strawberry.

4. FRAGARIA foliis ovatis carnosis hirsutis, fructu maximo. Strawberry of *Chili* with a large fruit, and hairy fleshy leaves, called *Fruilla* in *America*.

There are several other varieties of this fruit, which are now cultivated in *England* ; but these, I think, may be allowed to be distinct species, for they never alter from one to the other, by any cultivation, though the fruit is frequently improved, so as to be of a larger size thereby ; I shall next mention the varieties of Strawberries, which are at present to be found in the *English* gardens, under the several species to which they naturally belong.

The first sort is the common Wood Strawberry, which grows naturally in the woods, in many parts of *England*, and is so well known, as to need no description ; of this there are three varieties, 1. The common sort with red fruit. 2. The white Wood Strawberry, which ripens a little later in the season, and is by many persons preferred to it for its quick flavour ; but as it seldom produces so large crops as the red sort, so it is not very generally cultivated. 3. The green Strawberry, by some called the Pine Apple Strawberry, from its rich flavour. The fruit of this is green, with a faint shade of red, when ripe ; it is very firm, hath a very high flavour, and is a late ripe fruit ; but unless it is planted in a moist loamy soil, it is a very bad bearer, but in such land where it does succeed, it merits cultivation as much as any of the sorts. There is also a variety of this which has been raised from seeds by the Right Hon. Lord *Willoughby* of *Parham*, which continues to produce fruit from the first season of Strawberries, till prevented by frost ; the fruit has a higher flavour than the Wood Strawberry, so deserves encouragement.

The Scarlet Strawberry is the sort which is first ripe, for which reason it merits esteem, had it nothing else to recommend it ; but the fruit is so good, as by many persons of good taste to be preferred to all the other sorts ; this was brought from *Virginia*, where it grows naturally in the woods, and is so different from the Wood Strawberry in leaf, flower, and fruit, that there need be no doubt of their being distinct species.

There is a variety of this which hath been of late years introduced from the northern parts of *America*, which has the appearance of a distinct species. The leaves of this are rounder, and not so deeply veined ; the crenatures on their edges are broader and more obtuse. The leaves which compose the empalement, are much longer, and are hairy, the fruit is also much larger ; but in other respects it approaches near to the scarlet Strawberry, so I have chosen to join it to that, rather than make a distinct species of it ; this I have been informed grows naturally in *Louisiana*.

The Hautboy Strawberry, which the *French* call *Capitons*, came originally from *America*, and is very different from the other sorts in leaf, flower, and fruit, as that no one can doubt of their being different species ; there is an improvement of this sort, which is commonly called the Globe Hautboy. The fruit of this is larger, and of a globular form, but this difference has certainly arisen from culture ; for where these have been neglected a year or two, they have degenerated to the common Hautboy again ; where the ground is proper for this plant, and their culture is well managed, the plants will produce great plenty of fruit, which will be large and well flavoured, and by some persons are preferred to all the other sorts.

The *Chili* Strawberry was brought to *Europe* by *Monf. Frazier*, an engineer, who was sent to *America* by the late king of *France*; in the year 1727, I brought a parcel of the plants to *England*, which were communicated to me by *Mr. George Clifford*, of *Amsterdam*, who had large beds of this sort growing in his curious gardens at *Hartecamp*. The leaves of this sort are hairy, oval, and of a much thicker substance, than those of any sort yet known, and stand upon very strong hairy foot-stalks; the runners from the plants are very large, hairy, and extend to a great length, putting out plants at several distances. The foot-stalks which sustain the flowers are very strong; the leaves of the empalement are long and hairy. The flowers are large, and often deformed, so are the fruit also when cultivated in very strong land, in which the plants produce plenty, which are firm and very well flavoured, but as it is a bad bearer in most places where it has been cultivated, so in general it has been neglected.

Strawberries love a gentle hazelly loam, in which they will thrive and bear greater plenty of fruit, than in a light rich soil. The ground should also be moist, for if it is very dry, all the watering which is given to the plants in warm dry seasons, will not be sufficient to procure plenty of fruit; nor should the ground be much dunged, for that will cause the plants to put out many runners, and grow luxuriant, and will render them less fruitful.

The best time to remove these plants is in *October*, that they may get new roots before the hard frost sets in, which loosens the ground, so that if the roots of the plants are not pretty well established, the plants are frequently turned out of the ground after frost by the first thaw; therefore the sooner they are planted when the autumnal rains begin, the better will their roots be established, and sometimes those which are well rooted, will produce a few fruit the first year; there are some who transplant their plants in the spring, but where this is done they must be duly supplied with water in dry weather, otherwise they will not succeed.

The ground in which these are planted should be thoroughly cleaned from the roots of Couch, and all other bad weeds, for as the Strawberry plants are to remain three years before they are taken up, so if any of the roots of these bad weeds are left in the ground, they will have time to multiply so greatly as to fill the ground, and overbear the Strawberry plants. The usual method is to lay the ground out into beds of four feet broad, with paths two feet, or two feet and a half broad between each; these paths are necessary for the convenience of gathering the fruit, and for weeding and dressing of the beds: after the beds are marked out, there should be four lines drawn in each, at a foot distance, which will leave six inches space on each side, between the outside rows and the paths; when the plants should be planted at a foot distance from each other in the rows, in a quincunx order, being careful to close the ground to the roots of the plants when they are planted, and if there should not happen rain soon after, the plants should be well watered to settle the earth to their roots.

The distance here mentioned for the plants to be placed, must be understood for the Wood Strawberries only, for as the other sorts grow much larger, their distances must be proportioned to their several growths; therefore the *Scarlets* and *Hautboy*, should have but three rows of plants in each bed, which should be at fifteen inches distance, and the plants in the rows should be allowed the same space from each other; and the *Chili* Strawberry must have but two rows of plants in each bed, which should also be two feet apart in the rows, for as these grow very strong, if they have not room to spread, they will not be very fruitful.

In the chusing proper plants of any of the sorts, depends the whole success, for if they are promiscuously taken from beds without care, great part of the plants will become barren; these are generally called blind, which is when there are plenty of small flowers but no fruit produced; if these flowers are well examined, they will be found to want the female organs of generation, most of them abounding with stamina, but they have few, if any styles, so that it frequently happens among these barren plants, that some of them will have a part of an imperfect fruit formed, which will sometimes ripen; this barrenness is not peculiar to Strawberries, but is general to all those plants which have creeping roots or stalks; and the more they increase from either, the sooner they become barren, and this in some degree runs through the whole vegetable kingdom; for trees and shrubs which are propagated by cuttings, are generally barren of seeds in two generations, that is, when they are propagated by cuttings, which were taken from plants raised by cuttings; this I have constantly found to hold in great numbers of plants, and in fruit trees it often happens, that those sorts which have been long propagated by grafts and buds, have no kernels: but to return to the choice of the Strawberry plants; these should never be taken from old neglected beds, where the plants have been suffered to spread or run into a multitude of suckers, nor from any plants which are not very fruitful; and those offsets which stand nearest to the old plants, should always be preferred to those which are produced from the trailing stalks at a farther distance; the Wood Strawberry is best when the plants are taken fresh from the woods, provided they are taken from fruitful plants, because they are not so liable to ramble and spread, as those which are taken from plants which have been long cultivated in gardens; therefore those who are curious in cultivating of this fruit, should be very careful in the choice of their plants.

When the plants have taken new root, the next care is, if the winter should prove severe, to lay some old tanners bark over the surface of the bed between the plants, to keep out the frost; this care is absolutely necessary to the *Chili* Strawberry, which is frequently killed in hard winters, where they are exposed without any covering; therefore where tanners bark cannot be easily procured, saw-dust, or sea-coal ashes may be used; or in want of these, if decayed leaves of trees, or the branches of ever-green trees with their leaves upon them, are laid over the beds, to prevent the frost from penetrating deep into the ground, it will secure the plants from injury.

The following summer, the plants should be constantly kept clean from weeds, and all the runners should be pulled off as fast as they are produced; if this is constantly practised, the plants will become very strong by the following autumn, whereas when this is neglected (as is too frequently seen) and all the runners permitted to stand during the summer season, and then pulled off in autumn, the plants will not be half so strong as those where that care has been taken; therefore there will not be near the same quantity of fruit upon them the following spring, nor will the fruit be near so large and fair; where proper care is taken of the plants the first summer, there is generally a plentiful crop of fruit the second spring, whereas when this is neglected, the crop will be thin and the fruit small.

As this fruit is very common, there are but few persons who cultivate it with proper attention, therefore I shall give some directions for the doing of it, which, if carefully practised, will be attended with success.

The old plants of Strawberries are those which produce the fruit, for the suckers never produce any till they have grown a full year; therefore it appears how necessary it is to divest the old plants of them, for wherever they are suffered

suffered to remain, they rob the fruitful plants of their nourishment, in proportion to their number; for each of these suckers send out a quantity of roots, which interfere, and are so closely matted together, as to draw away the greatest part of the nourishment from the old roots, whereby they are greatly weakened; and these suckers also render each other very weak, so from hence the cause of barrenness arises; for I have known where the old plants have been constantly kept clear from suckers, they have continued very fruitful four or five years without being transplanted; however it is the best way to have a succession of beds, that after three years standing, they may be taken up, because by that time they will have exhausted the ground of those vegetable salts, necessary for the nourishment of that species of plants; for it is always observed, that Strawberries planted on fresh land, are the most fruitful.

The next thing to be observed, is in autumn to divest the plants of any strings, or runners, which may have been produced, and also of all the decayed leaves, and the beds cleared from weeds; then the paths should be dug up, and the weeds buried which were taken from the beds, and some earth laid over the surface of the beds between the plants, this will strengthen and prepare them for the following spring; and if after this, there is some old tanners bark laid over the surface of the ground between the plants, it will be of great service to them. In the spring, after the danger of hard frost is over, the ground between the plants in the beds should be forked, with a narrow three pronged fork, to loosen the ground, and break the clods; and in this operation, the tan which was laid over the surface of the ground in autumn will be buried, which will be a good dressing to the Strawberries, especially in strong land; then about the end of *March*, or the beginning of *April*, if the surface of the bed is covered with moss, it will keep the ground moist, and prevent the drying winds from penetrating the ground, and thereby secure a good crop of fruit; and the moss will preserve the fruit clean, that when heavy rains fall after the fruit is full grown, there will be no dirt washed over them, which frequently happens where this is not practised, so the fruit must be washed before it is fit for the table, which greatly diminishes its flavour.

The soil in which the *Chili* Strawberry is found to succeed best, is a very strong brick earth, approaching near to clay; in this soil I have seen them produce a tolerable good crop, and the fruit has been extremely well flavoured; and where care has been taken to pull off the runners as they are produced from the old plants, they have been as fruitful as the common Hautboy; this I mention from two or three experiments, which have been made by my direction, and not from theory.

There are some persons who are so fond of Strawberries, as to be at any expence to obtain them early in the year, and to continue them as late in the season as possible; therefore should I omit to give some directions for these purposes, they would suppose the book very defective; therefore I shall mention the practice of some few, who have succeeded best in the management of these fruits. I shall begin with directions for obtaining of this fruit early in the spring.

Where there are any hot walls erected in gardens for the producing early fruit, it is very common to see Strawberries planted in the borders, that the fire which is applied for ripening of the fruit against the wall, may serve the purpose of bringing forward the Strawberries; but where this is practised, the Strawberry plants should be annually renewed, and all the earth of the borders should also be taken out at least two feet deep, and fresh earth brought in, which will be equally good for the wall trees; but as was before observed, that the old plants of Strawberries only,

are those which produce the fruit, there should be a sufficient number of plants kept in pots to supply the border annually, and the same must be done if they are to be raised on a common hot-bed, or in stoves; therefore I shall begin with giving directions for the raising and preparing the plants for those purposes.

The sort which is the most proper for forcing early, is the scarlet Strawberry, for the Hautboy grows too large for this purpose, and the Wood is too backward. In the choice of the plants, there should be an especial care taken to have them from the most fruitful plants, and those which grow immediately to the old plants; these should be taken off in the spring, and each planted in a separate pot filled with loamy soil, and placed in the shade till they have taken root, after which they may be removed to a shady situation, where they may remain till the middle of *November*, when the pots should be plunged into the ground up to their rims, to prevent the frost from penetrating through the side of the pots; if these are placed near a wall, pale, or hedge, exposed to an east aspect, they will succeed better than in a warmer situation, because they will not be forced too forward.

Those which are designed for the borders near a hot wall, may then be turned out of the pots, and planted into the borders, that they may have time to get fresh rooting, before the fires are made to heat the walls; when these are planted, they may be placed pretty close to each other, for as they are designed to remain there no longer than till they have ripened their fruit, they will not require much room, because their roots will find sufficient nourishment below, and also from the earth which is filled into the spaces between the balls of earth, about their roots; for it is of consequence to get as much fruit as possible in a small space, where there is an expence to force them early. If the fires are lighted about *Christmas*, the Strawberries in these borders will be ripe the end of *March*; or if the season should prove very cold, it may be the middle of *April* before they are fit for the table.

In the management of the plants there must be care taken to supply them with water when they begin to shew their flowers, otherwise they will fall off without producing any fruit; and, in mild weather, there should be fresh air admitted to them every day; but as fruit trees against the wall must be so treated, the same management will agree with the Strawberries.

If the Strawberries are intended to be forced in a stove, where there are Pine Apples, and no room to plunge them in the tan-bed, then the plants should be transplanted into larger pots in *September*, that they may be well rooted before they are removed into the stove, which should not be till *December*; but if they are placed under a frame the beginning of *November*, where they may be screened from the frost, it will prepare the plants better for forcing; and those who are desirous to have them very early, make a hot-bed under frames, upon which they place their plants the latter end of *October*, which will bring them forward to flower, and then they remove the plants into the stove; when these plants are removed into the stove, they should be placed near to the glassies, that they may enjoy as much of the sun as possible, for when they are placed backward, the plants will draw up weak, and the flowers will drop without producing fruit. The earth in the pots will dry pretty fast when they stand dry upon the pavement of the hot-house, therefore the plants must be duly watered, but it must be done with discretion, and not too much given to them at one time, which will be equally hurtful to them; if these plants are properly managed, they will produce ripe fruit in *February*, which is as early as most people will chuse to eat them. When the fruit is all gathered

thered from the plants, they should be turned out of the stove, for as they will be of no farther service, they should not remain to take up the room; nor should those plants which are planted in the borders near the hot walls, be left there after their fruit is gathered, but immediately taken up, that they may rob the fruit trees of their nourishment as little as possible.

Where there is no conveniency of stoves, or hot walls for this purpose, the fruit may be ripened upon common hot-beds; and though they may not be quite so early as with the other advantages, yet I have seen great crops of the fruit ripe in *April*, which were upon common hot-beds under frames, and done with a small expence in the following manner.

The plants were prepared in pots after the manner before directed, which were placed in a warm situation in the beginning of *October*, and about *Christmas* the hot-bed was made, in the same manner as for Cucumbers, but not so strong, and as soon as the first violent steam of the dung was over, some old rotten dung, laid over the hot-bed to keep down the heat, or where it can be easily procured, neats dung is preferable for this purpose; then the pots should be placed upon the bed as close together as possible, filling up the interstices between the pots with earth; the plants must have air admitted to them every day, and if the heat of the bed is too great, the pots should be raised up, to prevent their roots being scorched, and when the bed is too cold, the sides of it should be lined with some hot dung; this first bed will bring the plants to flower by the middle, or latter end of *February*, by which time the heat of the bed will be spent, therefore another hot-bed should be prepared to receive the plants, which need not be so strong as the first; but upon the hot dung, should be laid some neats dung about two inches thick, which should be equally spread and smoothed, this will prevent the heat of the bed from injuring the roots of the plants; upon this should be laid two inches of a loamy soil; when this has laid two days to warm, the plants should be taken out of the first hot-bed, and turned carefully out of the pots, preserving all the earth to their roots, and placed close together upon this new hot-bed, filling up the vacancies between the balls, with loamy earth; the roots of the plants will soon strike out into this fresh earth, which will strengthen their flowers, and cause their fruit to set in plenty; and if proper care is taken to admit fresh air to the plants, and supply them properly with water, they will have plenty of ripe fruit in *April*, which will be full two months before their natural season.

The methods practised to retard this fruit, is first by planting them in the coldest part of the garden, where they may be as much in shade as possible, and the soil should be strong and cold; when there are such places in a garden, the fruit will be near a month later than in a warm situation; the next is to cut off all the flowers when they first appear, and if the season proves dry, to water them plentifully, which will cause them to put out a fresh crop of flowers; and if they are supplied with water, there will be a late crop of fruit, but these are not so well flavoured as those which ripen in their natural season. But this new Alpine Strawberry will naturally supply the table great part of summer and autumn, and the fruit will be well flavoured.

FRANGULA. *Tourn. Inst. R. H.* 612. *tab.* 383. Berry-bearing Alder.

The Characters are,

The flower hath one petal, cut into five segments. It hath five stamina, which are the length of the petal; in the center is situated a globular germeu, which afterward becomes a round berry, inclosing two plain roundish seeds.

The Species are,

1. FRANGULA *foliis ovato-lanceolatis glabris*. Black Berry-bearing Alder.
2. FRANGULA *foliis lanceolatis rugosis*. Berry-bearing Alder with a larger and rougher leaf.
3. FRANGULA *foliis ovatis nervosis*. Low Mountain rocky Berry-bearing Alder, with a round leaf.

The first sort grows naturally in the woods, in many parts of *England*, so is seldom planted in gardens; it rises with a woody stem to the height of ten or twelve feet, sending out many irregular branches, covered with a dark bark, garnished with oval spear-shaped leaves, about two inches long, and one broad, having several transverse veins from the midrib to the sides. The flowers are produced in clusters at the end of the former year's shoots, and also upon the first and second joints of the same year's shoot, each standing upon a short separate foot-stalk; they are small, of an herbaceous colour, and are succeeded by small round berries, which turn first red, but are black when ripe. The flowers appear in *June*, and the berries ripen in *September*; this stands in the Dispensatory as a medicinal plant, but is seldom used.

The second sort hath larger and rougher leaves than the first. It grows naturally on the *Alps*, and other mountainous parts of *Europe*, and is preserved in some gardens for the sake of variety.

The third sort is of humble growth, seldom rising above two feet high; this grows on the *Pyrenean* mountains, and is seldom preserved, unless in botanick gardens for variety; it may be increased by laying down the branches, but must have a strong soil.

These shrubs are easily propagated by seeds, which should be sown as soon as they are ripe, and then the plants will come up the spring following; but if they are kept out of the ground till spring, the plants will not come up till the second year. When the plants come up, they must be kept clean from weeds till autumn, then they may be taken up and planted in a nursery, in rows two feet asunder, and at one foot distance in the rows; in this nursery they may remain two years, and may then be planted where they are to remain; they may also be propagated by layers and cuttings, but the seedling plants are best.

FRAXINELLA. See Dictamnus.

FRAXINUS. *Lin. Gen. Plant.* 1026. The Ash tree.

The Characters are,

It hath hermaphrodite and female flowers on the same tree, and sometimes on different trees. The hermaphrodite flowers have no petals, but a small empalement including two erect stamina. In the center is situated an oval compressed germeu, which afterward becomes a compressed bordered fruit, shaped like a bird's tongue, having one cell, inclosing a seed of the same form. The female flowers are the same, but have no stamina.

The Species are,

1. FRAXINUS *foliolis serratis, floribus apetalis*. *Lin. Sp. Plant* 1057. The common Ash.
2. FRAXINUS *foliolis ovato-lanceolatis serratis, floribus coloratis*. Ash tree with a rounder leaf, commonly called Manna Ash.
3. FRAXINUS *foliolis serratis, floribus corollatis*. *Lin. Sp. Plant.* 1057. Dwarf Ash of *Theophrastus*, with smaller and narrower leaves.
4. FRAXINUS *foliolis lanceolatis glabris, floribus paniculatis terminatricibus*. The flowering Ash.
5. FRAXINUS *foliolis integerrimis, petiolis teretibus*. *Flor. Virg.* 122. *New England* Ash, with long acute points to the wings of the leaves.
6. FRAXINUS *foliolis lanceolatis, minimè serratis, petiolis teretibus pubescentibus*. *Carolina* Ash with a broad fruit.

The first sort is the common Ash tree, which grows naturally in most parts of *England*, and is so well known as to need no description. The leaves of this sort have generally five pair of lobes, terminated by an odd one; they are of a very dark green, and their edges are slightly sawed. The flowers are produced in loose spikes from the side of the branches, which are succeeded by flat seeds, which ripen in autumn; there is a variety of this with variegated leaves, which is preserved in some gardens.

The second sort grows naturally in *Calabria*, and is generally supposed to be the tree from whence the manna is collected, which is an exudation from the leaves of the tree. The shoots of this tree are much shorter, and the joints closer together, than those of the first sort; the small leaves are shorter, and deeper sawed on their edges, and are of a lighter green. The flowers come out from the side of the branches, which are of a purple colour, and appear in the spring before the leaves come out. This tree is of humble growth, seldom rising more than fifteen or sixteen feet high in *England*.

The third sort is a low tree, which rises about the same height as the second; the leaves of this sort are much smaller and narrower than those of the first, but are sawed on their edges, and are of the same dark colour. The flowers of this sort have petals, which are wanting in the common Ash.

The fourth sort was raised by the late Dr. *Uvedale* at *Enfield*, from seeds which were brought from *Italy* by Dr. *William Skérard*, where the trees grow naturally; and was supposed to be a different sort from that mentioned by Dr. *Morrison*, in his *Praeludia Botanica*, but by comparing them together they appear to be the same.

The leaves of this sort have but three or four pair of lobes (or small leaves) which are short, broad, and smooth, of a lucid green, irregularly sawed on the edges. The flowers grow in loose panicles at the end of the branches; these are most of them male, having two stamina in each, but no germen or style; they are of a white herbaceous colour, and appear in *May*. As this sort very rarely produces seeds in *England*, so it is propagated by grafting or budding it upon the common Ash.

The fifth sort was raised from seeds, which were sent from *New England* in the year 1724, by Mr. *Moore*. The leaves of this tree have but three, or at most but four pair of lobes, which are placed far distant from each other, and are terminated by an odd one, which runs out into a very long point; they are of a light green and entire, having no serratures on their edges: this tree shoots into strong irregular branches, but doth not grow to a large size in the trunk. It is propagated by grafting it upon the common Ash.

The sixth sort was raised from seeds, which were sent from *Carolina* in the year 1724, by Mr. *Catesby*. The leaves of this sort have seldom more than three pair of lobes, the lower being the least, and the upper are the largest; of a light green colour, and slightly sawed on their edges; the foot-stalk, or rather the midrib of the leaves is taper, and has short downy hairs; the seeds are broader than those of the common Ash, and are of a very light colour. As this sort hath not yet produced seeds in *England*, it is propagated by grafting it upon the common Ash.

These trees are now propagated in plenty in the nurseries for sale, as there has been of late years a great demand for all the hardy sorts of trees and shrubs, which will live in the open air; but all those trees which are grafted upon the common Ash, are not so valuable as those which are raised from seeds, because the stock generally grows much faster than the grafts; whereby the lower part

of the trunk, so far as the stock rises, will often be twice the size of the upper; and if the trees stand much exposed to the wind, the grafts are frequently broken off to the stock, after they are grown to a large size, which is a great disappointment to a person after having waited several years, to see their trees suddenly destroyed. Beside, if the wood of either of the sorts is valuable, it can be of little use when the trees are so raised.

The fourth sort is generally planted for ornament, the flowers making a fine appearance when they are in beauty, every branch being terminated by a large loose panicle; so that when the trees are large, and covered with flowers, they are distinguishable at a great distance.

All the other sorts serve to make a variety in plantations, but have little beauty to recommend them; and as their wood seems to be greatly inferior to that of the common Ash, so there should be few of these planted, because they will only fill up the space where better trees might grow.

The common Ash propagates itself in plenty by the seeds which scatter in the autumn, so that where the seeds happen to fall in places where cattle do not come, there will be plenty of the plants come up in the spring; but where any person is desirous to raise a quantity of the trees, the seeds should be sown as soon as they are ripe, and then the plants will come up the following spring; but if the seeds are kept out of the ground till spring, the plants will not come up till the year after, which is the same with all the sorts of Ash; so that when any of their seeds are brought from abroad, as they seldom arrive here before the spring, the plants must not be expected to appear till the next year; therefore the ground should be kept clean all the summer where they are sown, and not disturbed, lest the seeds should be turned out of the ground, or buried too deep to grow; for many persons are too impatient to wait a year for the growth of seeds, so that if they do not come up the first year, they dig up the ground, and thereby destroy the seeds,

When the plants come up, they must be kept clean from weeds during the summer; and if they make good progress in the seed-bed, they will be fit to transplant by the following autumn, therefore there should be some ground prepared to receive them; and as soon as their leaves begin to fall, they may be transplanted. In the taking of them up, there should be care taken not to break or tear off their roots; to prevent which, they should be taken up with a spade, and not drawn up, as is frequently practised; for as many of the plants which rise first from seeds, will out-strip the others in their growth, so it is frequently practised, to draw up the largest plants, and leave the smaller to grow a year longer before they are transplanted; and to avoid hurting those which are left, the others are drawn out by hand, and thereby many of their roots are torn off or broken; therefore it is much the better way to take all up, little or big together, and transplant them out, placing the large ones together in rows, and the smaller by themselves. The rows should be three feet asunder, and the plants a foot and a half distance in the rows; in this nursery they may remain two years, by which time they will be strong enough to plant where they are to remain; for the younger they are planted out, the larger they will grow; so that where they are designed for use, they should be planted very young; and the ground where the plants are raised, should not be better than that where they are designed to grow; for when any plants are raised in good land, and afterward transplanted into worse, they very rarely thrive; so that it is much the best method to make the nursery upon a part of the same land, where the trees are designed to be planted, and then a sufficient number

ber of the trees may be left standing upon the ground, and these will out-strip those which are removed, and will grow to a larger size.

Where people live in the neighbourhood of Ash trees, they may supply themselves with plenty of self-sown plants, provided cattle are not suffered to graze on the land, for if cattle can come to them they will eat off the young plants, and not suffer them to grow; but where the seeds fall in hedges, and are protected by bushes, the plants will come up and thrive; in these hedges the trees frequently are permitted to grow till they have destroyed the hedge, for there is scarce any tree so hurtful to all kinds of vegetables as the Ash, which robs every plant of its nourishment within the reach of its roots, therefore should never be suffered to grow in hedge-rows; for they not only kill the hedge, but impoverish Corn, or whatever is sown near them. Nor should any Ash trees be permitted to grow near pasture grounds, for if any of the cows eat of the leaves or shoots of the Ash, all the butter which is made of their milk will be rank and of little or no value; which is always the quality of the butter which is made about *Guildford, Godalmin*, and some other parts of *Surry*, where there are Ash trees growing about all their pastures, so that it is very rare to meet with any butter in those places which is fit to eat; but in all the good dairy counties, they never suffer an Ash tree to grow.

If a wood of these trees is rightly managed, it will turn greatly to the advantage of its owner; for by the under-wood, which will be fit to cut every eight or ten years, there will be a continual income more than sufficient to pay the rent of the ground, and all other charges; and still there will be a stock preserved for timber, which in a few years, will be worth forty or fifty shillings per tree.

This timber is of excellent use to the wheelwright and cartwright for ploughs, axle-trees, wheel-rings, harrows, bulls, oars, blocks for pullies, and many other purposes.

The best season for felling of these trees is from *November* to *February*; for if it be done either too early in autumn, or too late in the spring, the timber will be subject to be infested with worms, and other insects; but for lopping of Pollards, the spring is preferable for all soft woods.

FRITILLARIA. *Lin. Gen. Plant.* 372. Fritillary, or chequered Tulip and Crown Imperial.

The Characters are,

The flower hath no empalament; it hath six oblong bell-shaped petals; in the hollow, at the base of each petal, is situated a nectarium; the flower hath six stamina standing near the style. In the center is situated an oblong three-cornered germen, which afterward becomes an oblong capsule with three lobes, having three cells, which are filled with flat seeds ranged in a double order.

The Species are,

1. **FRITILLARIA** *foliis linearibus alternis, floribus terminalibus.* Early, purple, variegated, chequered Tulip.
2. **FRITILLARIA** *foliis infimis oppositis.* *Hort. Cliff.* 81. *Aquitain* chequered Tulip, with an obscure yellow flower.
3. **FRITILLARIA** *floribus ascendens.* Fritillary with flowers growing above each other; or, Black chequered Tulip.
4. **FRITILLARIA** *foliis lanceolatis, caule unifloro maximo.* Largest yellow *Italian* Fritillary.
5. **FRITILLARIA** *floribus umbellatis.* Fritillary with flowers growing in umbels.
6. **FRITILLARIA** *racemo nudiusculo, foliis obliquis.* *Hort. Upsal.* 82. The *Persian* Lily.
7. **FRITILLARIA** *floribus racemosis.* Branching Fritillary, or smaller *Persian* Lily.

8. **FRITILLARIA** *racemo comofo infernè nudo, foliis integerrimis.* *Lin. Hort. Upsal.* 82. Crown Imperial.

9. **FRITILLARIA** *racemo comofo infernè nudo, foliis crenatis.* *Lin. Sp. Plant.* 303. Royal Crown, with a crenated Lily leaf.

The first sort grows naturally in *Italy*, and other warm parts of *Europe*; and from the seeds of this there have been great varieties raised in the gardens of the florists, which differ in the size and colour of their flowers; and as there are frequently new varieties produced, so it would be to little purpose to enumerate those which are at present in the *English* and *Dutch* gardens.

The first hath a round compressed root, in shape like that of Corn Flag, but is of a yellowish white colour; the stalk rises about fifteen inches high, having three or four narrow long leaves placed alternately; the top is divided into two slender foot stalks, which turn downward, each sustaining one bell-shaped inverted flower, composed of six petals, which are chequered with purple and white like a chess-board; in the center is situated a germen supporting one style, crowned by a trisid stigma. At the bottom of each petal there is a cavity, in which is situated a nectarium; filled with a sweet liquor; after the flower is fallen, the germen swells to a pretty large, three-cornered, blunt capsule, then the foot-stalk is turned and stands erect; when the seeds are ripe, the capsule opens in three parts and lets out the flat seeds, which were ranged in a double order.

The second sort grows naturally in *France*; the leaves of this are broader, and of a deeper green than the former; the lower leaves are placed opposite, but those above are alternate; the stalk rises a foot and a half high, is terminated by two flowers of an obscure yellow colour, which spread more at the brim than those of the first sort, but are turned downward in the same manner. This flowers three weeks after the first. This grows naturally in some parts of *England*.

The third sort seldom rises more than a foot high, the leaves are narrow like those of the first, but are shorter; each stalk is terminated by three or four flowers, which arise above each other, of a very dark purple, chequered with yellowish spots.

The fourth sort rises about a foot high, the stalk is garnished with spear-shaped leaves, of a Grass green colour; these are sometimes placed opposite, but generally alternate; the stalk is terminated by one large bell-shaped flower of a yellowish colour, chequered with light purple.

The fifth sort rises a foot and a half high; the stalk is garnished with shorter and broader leaves than the first sort, of a grayish colour; the flowers are produced round the stalks like those of the Crown Imperial, of a dark purple colour, chequered with a yellowish green.

The sixth sort is commonly called the *Persian* Lily, and is supposed to grow naturally in *Persia*; the root of this sort is round and large, the stalk rises three feet high; the lower part of it is closely garnished with long twisted leaves of a gray colour, standing on every side of the stalks; the flowers grow in a loose spike at the top of the stalk, forming a pyramid; they are shaped like those of the other species, but are much shorter, and spread wider at their brims, and are not bent downward like those. They are of a dark purple colour, but are seldom succeeded by seeds in *England*, so are only propagated by offsets.

The seventh sort has a much shorter stalk than the last, but is garnished with leaves like those, only they are smaller; the stalks branch out at the top into several small foot-stalks, each sustaining one dark coloured flower. This is commonly called the small *Persian* Lily, from its resemblance to the former sort.

These plants are propagated either by seeds, or offsets from the old roots; by the first of which methods new varieties may be obtained, as also a larger stock of roots in three years, than can be obtained in twenty or thirty years in the latter method: I shall therefore first treat of their propagation by seeds.

Having provided yourself with some good seeds, saved from the fairest flowers, you must procure some shallow pans or boxes, which must have holes in their bottoms to let out the moisture; these should be filled with light fresh earth, laying a few potshards over the holes, to prevent the earth from stopping them; then, having laid the earth very level in the boxes, &c. you must sow the seeds thereon pretty close, covering it with fine sifted earth a quarter of an inch thick. The time for sowing the seed is about the beginning of *August*, for if it be kept much longer out of the ground it will not grow. The farther management of the seeds, being the same as for the seeds of Tulips and Hyacinths, need not be repeated here.

When the seedling plants shew their flowers, which is generally the third year from sowing, you should put down a mark to the roots of all such as produce fair flowers, that at the time of taking them out of the ground (which ought to be soon after their green leaves are decayed), they may be selected for to plant in the borders of the parterre-garden, where; being intermixed with other flowers of different seasons, they will make a good appearance.

When a stock of good flowers are obtained, they may be preserved and increased in the same manner as other bulbous-rooted flowers, which is by offsets sent out from their roots, which should be taken off every other year from the finest sorts; but the ordinary flowers may remain three years undisturbed, in which time they will have multiplied so much, as that each root will have formed a cluster; so that if they are left longer together, the roots will be small, and the flowers very weak; therefore if these are taken up every other year, the roots will be the stronger. These roots may be treated in the same manner as Tulips, and other bulbous rooted flowers, with this difference only, that the roots of this will not bear to be kept out of the ground so long; therefore if there should be a necessity for keeping them out of the ground for a longer time, it will be best to put the roots into sand to prevent their shrinking.

The eighth sort is the Crown Imperial, which is now very common in the *English* gardens. This grows naturally in *Persia*, from whence it was first brought to *Constantinople*, and about the year 1570, was introduced to these parts of *Europe*; of this there are a great variety of sorts now preserved in the gardens of florists, but as they have been produced accidentally from seeds, so they may be included as one species; however, for the satisfaction of the curious, I shall here mention the varieties which have come to my knowledge.

1. The common Crown Imperial; this is of a dirty red colour.
2. The yellow Crown Imperial; this is of a bright yellow.
3. The bright red Crown Imperial, called Fusiai.
4. The pale yellow Crown Imperial.
5. The yellow striped Crown Imperial.
6. The large flowering Crown Imperial.
7. The broad leaved late red Crown Imperial.
8. The double and triple crowned Crown Imperial.
9. The double red Crown Imperial.
10. The double yellow Crown Imperial.
11. The silver striped leaved Crown Imperial.
12. The yellow striped leaved Crown Imperial.

There are some few other varieties which are mentioned

in the catalogues of the *Dutch* florists, but their differences are so minute, that they are not distinguishable, so I shall pass them over.

The Crown Imperial hath a large, round, scaly root of a yellow colour, and a strong odour of a fox; the stalk rises to the height of four feet or upward, it is strong, succulent, and garnished two thirds of the length on every side, with long, narrow, smooth leaves ending in points; the upper part of the stalk is naked, a foot or more in length; then the flowers come out all round the stalk upon short foot-stalks which turn downward, each sustaining one large spreading bell-shaped flower, composed of six spear-shaped petals; at the base of each petal is a pretty large cavity, in which is situated a large white nectarium, filled with a mellous liquor. In the center of the flower is fixed a three-cornered oblong germen, upon which rests the single style, which is the length of the petals, crowned by a spreading obtuse stigma; round the style there are six awl-shaped stamina which are shorter than the style, terminated by oblong four-cornered summits. These flowers hang downward; above and among them, arises a spreading tuft of green leaves which are erect, from between and below these come out the foot-stalks of the flowers; when the flowers decay, the germen swells to a large hexagonal capsule, shaped like a water-mill, having six cells which are filled with flat seeds, and the capsule turns erect.

The sort with yellow flowers, that with large flowers, and those with double flowers, are the most valuable; but that which hath two or three whorls of flowers above each other, makes the finest appearance; though this seldom produces its flowers after the same manner the first year after removing, but the second and third year the stalks will be taller, and frequently have three tier of flowers one above the other, which is called the triple crown.

As this is one of the earliest tall flowers of the spring, so it makes a fine appearance in the middle of large borders, at a season when such flowers are much wanted to decorate the pleasure-garden; but the rank fox-like odour which they emit, is too strong for most people, so hath rendered these flowers less valuable than they would have been, for there is something very pleasing in the sight of them at a distance.

These may be propagated by seeds, or offsets from the root; but the first is too tedious for most of the *English* florists, because the plants, so raised, are six or seven years before they flower; but the *Dutch* and *Flemish* gardeners, who have more patience, frequently raise them from seeds, whereby they get some new varieties, which rewards their labour. The method of propagating these flowers from seeds, being nearly the same as for the Tulip, the reader is desired to turn to that article; where there are full directions for performing it.

The common method of propagating them here, is by offsets sent out from the old roots, which will produce strong flowers the second year, after they are taken from the roots, but in order to have plenty of these, the roots should not be transplanted oftener than every third year, by which time each root will have put out several offsets, some of which will be large enough to flower the following year, so may be planted in the borders of the flower-garden, where they are to remain, and the smaller roots may be planted in a nursery-bed to grow a year or two according to their size; therefore they should be sorted, and the smallest roots planted in a bed together, which should remain there two years, and the larger by themselves to stand one year, by which time they will have acquired strength enough to flower, then may be removed into the pleasure-garden.

The time for taking up of these roots, is in the begin-

ning of July, when their stalks will be decayed; they may be kept out of the ground two months, but they should be laid single in a dry shady room, but not in heaps, or in a moist place, which will cause them to grow mouldy and rot. The offsets should be first planted, for as these are small, they will be apt to shrink if they are kept long out of the ground.

FRITILLARIA CRASSA. See Stape'ia.

FRUTEX PAVONIUS. See Poinciana.

FUCHSIA. Plum. Nov. Gen. 14.

The Characters are,

The flower hath one petal, with a closed tube, slightly cut into eight parts at the brim; it hath four stamina the length of the tube. The oval germen is situated under the flower, which after-ward becomes a succulent berry with four cells, containing several small oval seeds.

We know but one Species of this genus at present, viz.

FUCHSIA. Lin. Sp. Plant. 1191. Three-leaved Fuchsia, with a scarlet flower.

This plant is a native in the warmest parts of America; it was discovered by Father Plumier, in some of the French islands in America, and was since found by the late Dr. William Housloun, at Carthagena, in New-Spain.

It is propagated by seeds, which must be sown in pots, and plunged into a hot-bed of tanners bark, and treated in the same way as other seeds from warm countries. In about a month or six weeks after the seeds are sown, the plants will begin to appear; when they are about two inches high, they should be shaken out of the pots, and separated carefully; planting each into a small pot, and plunged again into a hot-bed of tanners bark, screening them from the sun, until they have taken new root; then they must have fresh air admitted to them, in proportion to the warmth of the season. As the season advances and becomes warm, the glasses of the hot-bed should be raised higher, to admit a greater share of air to the plants; and when the plants are grown so tall as to reach the glasses, they should be removed into the bark stove, and plunged into the tan-bed. In winter these plants require to be kept very warm, and at that season they must not have much water, but in summer it must be often repeated, and have much air in warm weather.

FUMARIA, Lin. Gen. Plant. 760. Fumatory.

The Characters are,

The flower is of the ringent kind, approaching near to the butterfly flowers. The upper lip is plain, obtuse, and reflexed; the nectarium at the base is obtuse, and little prominent. The base is keel-shaped; the nectarium at the base is less prominent. The chaps of the flower is four-cornered, and perpendicularly bifid. In the center is situated an oblong germen, which after-ward becomes a short pod with one cell, including roundish seeds.

The Species are,

1. FUMARIA pericarpis monospermis racemosis, caule diffuso. Lin. Sp. Plant. 700. Common Fumatory with a purple flower.

2. FUMARIA pericarpis monospermis spicatis, caule erecto, foliis filiformibus. Sauv. Monsp. 263. Lesser narrow-leaved Fumatory.

3. FUMARIA siliquis linearibus tetragonis, caulibus diffusis acutangulis. Lin. Sp. Plant. 700. Ever-green Fumatory with a white flower.

4. FUMARIA siliquis teretibus, caulibus diffusis, angulis obtusis. Yellow Tangier Fumatory.

5. FUMARIA siliquis linearibus, foliis cirrhiferis. Lin. Sp. Plant. 701. Fumatory with tendrils.

6. FUMARIA pericarpis monospermis racemosis, foliis scandentibus subcirrhosis. Lin. Sp. Plant. 701. Greater climbing Fumatory with a paler flower.

7. FUMARIA caule simplici, bracteis longitudine florum. Lin. Sp. Plant. 699. Greater bulbous Fumatory with a hollow root.

8. FUMARIA caule simplici, bracteis brevioribus multifidis, radice solida. Greater bulbous Fumatory with a solid root.

9. FUMARIA scapo nudo. Hort. Cliff. 351. Tuberous infusid Fumatory.

10. FUMARIA siliquis globosis inflatis. Hort. Upsal. 207. Climbing African Cysticapnos.

11. FUMARIA foliis triternatis, foliolis cordatis. Lin. Sp. Plant. 700. Nine-leaved Rock Fumatory of Spain.

12. FUMARIA siliquis linearibus paniculatis, caule erecto. Hort. Upsal. 207. Bastard Fumatory.

The first sort is the common Fumatory which is used in medicine, which grows naturally on arable land in most parts of England; it is a low annual plant, and flowers in April, May, and June; and very often from plants which rise late in the summer, there will be a second crop in autumn. The juice of this plant is greatly commended for bilious cholics. It is never cultivated in gardens.

The second sort grows naturally in the south of France, Spain, and Portugal, but is preserved in botanick gardens for the sake of variety. It is an annual plant, which rises from the scattered seeds better than when it is sown with care; the stalks of this grow more erect, the leaves are very finely divided, and the flowers grow in a close spike; they are of a deep red colour, and flower about the same time as the common sort.

The third sort grows naturally on the borders of the Mediterranean sea; it was first brought to England from Tangier. This is a perennial plant, which sends out from the root many branching stalks, which rise about six or eight inches high, growing in tufts or bunches; the leaves are very much divided, the stalks are angular, and the flowers grow in loose panicles upon naked foot-stalks, which come out from the divisions of the branches; they are of a whitish yellow colour, and there is a succession of them most part of the year.

The fourth sort hath an appearance very like the third, and by some it is supposed to be only a variety of that, but is undoubtedly a distinct species; for I have cultivated both more than thirty years, and never yet found either of them to vary. The stalks of this sort have blunt angles, whereas those of the third are acute; they are of a purplish colour, and the flowers grow in looser panicles, each having a longer foot-stalk than those of the other; they are of a bright yellow colour, and there is a succession of them great part of the year.

These two sorts continue green all the year, and except in very severe frost, are always in flower, which make a pretty appearance; they grow best on walls or rocks, and are very proper for the joints of grottos, or any rock-work; where, if a few plants are planted, or the seeds scattered, they will multiply fast enough from their scattering seeds, which are cast out of the pods by the elastic spring of the valves when ripe, to a considerable distance; and as the plants will require no care to cultivate them, they should not be wanting in gardens.

The fifth sort grows in stony and sandy places, in some parts of England; it is an annual plant with trailing stalks, sending out claspers from the leaves, which fasten to any of the neighbouring plants. It flowers in May and June, but is never cultivated in gardens.

The sixth sort is an annual plant with many trailing stalks, which grow about a foot long, sending out a few short tendrils, whereby they fasten to any neighbouring support; the flowers come out from the side of the stalks in loose bunches, they are of a whitish herbaceous colour, with a purple

purple spot on the upper lip. This flowers in *May* and *June*. It grows in *France* and *Italy*, on stony places in the shade.

The seventh sort grows naturally in the south of *France* and *Italy*, and was some years past preserved in the *English* gardens by way of ornament, but is now rarely to be found here; it was titled *Radix cava*, or hollow root, from its having a pretty large tuberous root hollowed in the middle. The stalk of this sort rises about six inches high, and does not divide, but is garnished toward the bottom with one ramous leaf, somewhat like the common *Fumatory*, but the lobes are broader; the flowers grow in a spike at the top of the stalk, they are of a pale purplish colour, and appear in *May*. This plant delights in the shade, and is multiplied by offsets, for it rarely ripens seeds in *England*.

The eighth sort is pretty common in many of the old gardens in *England*; it grows naturally in the south of *France*, in *Germany* and *Italy*. It hath a pretty large, round, solid root of a yellowish colour, from which come out branching leaves like those of the last sort, but the lobes are longer; the flowers grow in spikes on the tops of the stalks, they are of a purple colour, and come out early in *April*. The stalks of this sort are single, and rise about four or five inches high.

There is a variety of this with green flowers, which is mentioned in most of the books; but all the plants of this sort which I have yet seen, are only abortive, having no real flower, only a green bractea, which has been generally taken for the flowers.

The ninth sort grows naturally in *North America*; this hath a scaly root about the size of a large Hazel nut, from which comes out three or four leaves upon slender foot-stalks, divided into three parts; each of these parts is composed of many smaller divisions, which have narrow lobes divided into three parts almost to the bottom; the flower-stalk is naked, and eight or nine inches long, terminated by four or five flowers, growing in a loose spike; these have two petals, which are reflexed backward, and form a sort of fork toward the foot-stalk, and at their base are two horned nectariums, which stand horizontal. The flowers are of a dirty white colour and appear in *May*, but rarely produce seeds here.

This is propagated by offsets from the root, it loves a shady situation and a light soil; the best time to transplant the roots is in autumn, when the leaves are decayed, for it shoots pretty early in the spring, therefore it would not be safe to remove them at that season.

The tenth sort grows naturally at the *Cape of Good Hope*; this is an annual plant, with trailing stalks which are two or three feet long, dividing into many smaller, which are garnished with fine branching leaves shaped like those of the common *Fumatory*, but end with tendrils, which clasp to any neighbouring plants, and thereby the stalks are

supported; the flowers are produced in loose panicles, which proceed from the side of the stalks; they are of a whitish yellow colour, and are succeeded by globular swollen pods, in which are contained a row of small shining seeds.

This is propagated by seeds, which should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove, they must be each planted in a small pot filled with light earth, and plunged again into the hot-bed, and shaded from the sun till they have taken new root; then they should have a large share of air admitted to them, at all times in mild weather; as soon as the season is favourable, they should be inured to bear the open air, into which they may be removed the beginning of *June*, when they may be shaken out of the pots, preserving all the earth to their roots, and planted in a warm border, where their stalks should be supported with sticks to prevent their trailing on the ground; in *July* the plants will flower, and continue a succession of flowers till the frost destroys the plants; the seeds ripen in autumn.

The eleventh sort grows naturally upon old walls, or rocky places in *Spain* and *Italy*; this hath weak trailing stalks which are much divided, garnished with small leaves divided into three parts, each of which hath three heart-shaped lobes; the flowers are produced in small loose panicles from the side of the stalks, they are of a greenish white, and appear most of the summer months. It is an abiding plant, which propagates itself by the seeds that scatter, and thrives best in a shady situation, and on old walls or buildings.

The twelfth sort is an annual plant with an upright stalk, which grows a foot and a half high, sending out several branches upward, garnished with smooth branching leaves of a pale colour, divided like the common sort, but the lobes are larger and more obtuse; the flowers are produced in loose panicles from the sides of the stalks, and at the extremity of the branches; of a pale purple colour, with yellow chaps (or lips); these are succeeded by taper narrow pods, which contain many small shining black seeds. This flowers during most of the summer months, and the seeds ripen in *July*, *August*, and *September*. If the seeds of this plant are permitted to scatter, the plants will come up without any trouble, and require no other care but to thin them where they are too close, and keep them clean from weeds.

The fifth, sixth, seventh, and eighth sorts are propagated by offsets, as other bulbous-rooted flowers; these are pretty ornaments to borders in a small flower-garden early in the spring. They are extreme hardy; they love a light sandy soil, and should be suffered to remain three years undisturbed, in which time they will produce many offsets. The best season for transplanting them is from *May* to *August*, when the leaves die off; for if they are taken up when their leaves are fresh, it will greatly weaken their roots.

FURZ. See *Genista*.

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GALANTHUS. *Lin. Gen. Plant.* 362. The Snow-drop.

The Characters are,

The flower has three oblong concave petals, which spread open; in the bottom is situated the three-leaved nectarium, which is cylindrical; under the flower is situated the oval germen, attended by six stamina, which are gathered together. The germen afterward becomes an oval capsule, opening in three cells, filled with roundish seeds.

We know but one Species of this genus, which is,

GALANTHUS. *Lin. Hort. Cliff.* 134. The common Snow-drop.

There is a variety of this with double flowers.

This is valued for its early appearance in the spring, for the flowers usually blow in February when the ground is often covered with snow. The single sort comes out the first, and though the flowers are but small, yet when the roots are in bunches, they make a very pretty appearance; therefore these roots should not be planted single, as is sometimes practised by way of edging to borders; for when they are so disposed, they make very little appearance. But when there are twenty or more roots growing in a close bunch, the flowers have a very good effect; and as these flowers thrive well under trees or hedges, they are very proper to plant on the sides of wood-walks, and in wilderness quarters; where, if they are suffered to remain undisturbed, the roots will multiply exceedingly. The roots may be taken up the latter end of June, when their leaves decay, and may be kept out of the ground till the end of August, but they must not be removed oftener than every third or fourth year.

GALE. See Myrica.

GALEGA. *Lin. Gen. Plant.* 770. Goat's-rue.

The Characters are,

The flower is of the butterfly kind; the standard is oval, large, and reflexed; the wings are near the length of the standard; the keel is erect, oblong, and compressed; it has ten stamina which join above their middle. In the center is situated a narrow cylindrical germen, which afterward becomes a long pointed pod, inclosing several oblong kidney-shaped seeds.

The Species are,

1. **GALEGA foliolis lanceolato-linearibus, siliquis tenuioribus.** Common Goat's-rue with blue flowers.

2. **GALEGA foliolis lanceolatis, obtusis, floribus spicatis longioribus, siliquis crassioribus.** African Goat's-rue, with larger flowers and thicker pods.

3. **GALEGA foliis ovatis, floribus paniculatis alaribus, caule fruticoso scandente.** American Goat's-rue, with roundish leaves, scarlet flowers, and shrubby climbing stalks.

The first sort grows naturally in Italy and Spain, but is propagated in the English gardens for medicinal use. It hath a perennial root, from which arise many channelled hollow stalks, from two to three feet high, garnished with winged leaves, composed of six or seven pair of narrow spear-shaped lobes, terminated by an odd one; the flowers terminate the stalks growing in spikes, of a pale blue

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colour, and are succeeded by taper pods, with one row of kidney-shaped seeds.

There is a variety of this with white flowers, and another with variegated flowers, which have accidentally been produced from seeds, so are not constant, therefore are only mentioned here.

The second sort grows naturally in Africa; this differs from the former, in having larger leaves, which are composed of eight or ten pair of lobes, broader and blunter at their ends than those of the common sort; the flowers are larger, and the spikes are longer; the seed pods are also much thicker than those of the common sort, but in other respects are very like it.

These plants are propagated by seeds, which may be sown either in the spring or autumn, in an open situation; when the plants come up, and are strong enough to remove, a spot of ground should be prepared, in size proportionable to the quantity of plants designed; which should be well dug, and cleared from the roots of all noxious weeds; then the plants should be carefully taken up and planted in rows at a foot and a half distance every way, observing to water them till they have taken new root; after which they will require no farther care, but to keep them clean from weeds; if their stalks are cut down before the seeds are formed every year, the roots will continue the longer, especially if they grow on a light dry soil. The seeds of these will grow wherever they are permitted to scatter, so that plenty of the plants will come up without any care, and these may be transplanted and managed in the same manner as is before directed.

The third sort was discovered by the late curious botanist Dr. William Houstoun, at Campeachy. This plant is propagated by seeds, which must be sown on a hot-bed early in the spring; when the plants come up, and are fit to transplant, they must be each put into a separate small pot, and plunged into a hot-bed of tanners bark, shading them from the sun till they have taken new root; then they must be treated as hath been directed for other tender plants, which are kept in the bark-stove. With this management they will flower, and in warm seasons will perfect their seeds, but the plants may be preserved through one winter in the bark-stove.

GALENIA. *Lin. Gen. Plant.* 443.

The Characters are,

The flower hath no petals, but eight hairy stamina the length of the empalement. In the center is situated a roundish germen. The empalement afterward becomes a roundish capsule with two cells, containing two oblong angular seeds.

We know but one Species of this genus, viz.

GALENIA. *Hort. Cliff.* 150. Shrubby Galenia.

This plant grows naturally at the Cape of Good Hope, and in other parts of Africa; it rises with a shrubby stalk four feet high, sending out many weak branches, garnished with very narrow leaves placed irregularly, of a light green, with a furrow running longitudinally through the middle; the flowers are produced in loose panicles, from the side

and at the end of the branches; they are very small, and have no petals like the *Chenopodium*.

This plant must be placed in the green-house in winter, with other hardy exotick plants, where it may have a large share of air in mild weather, for it only requires to be protected from frost. In the summer it may be exposed in the open air, with other plants of the same country. It may be propagated by cuttings, which, if planted during any of the summer months, and watered frequently, will take root in about five or six weeks, and may then be treated as is directed for the old plants.

GALEOPSIS. *Lin. Gen. Plant.* 637. Stinking Dead Nettle.

The Characters are,

The flower is of the lip kind; the chaps are broad, from the base to the under lip, it is on both sides sharply indented; the upper lip is concave, and sawed at the top; the under lip is trifid, the middle segment being the largest. It hath four stamina, two being shorter than the other. In the center is situated a quadrifid germen, which afterward become four naked seeds, sitting in the rigid empalement.

The Species are,

1. **GALEOPSIS internodiis caulinis æqualibus, verticillis omnibus remotis.** *Lin. Sp. Plant.* 579. Red narrow-leaved Field Ironwort.

2. **GALEOPSIS internodiis supernè incrassatis, verticillis summis subcontiguis.** *Lin. Sp. Plant.* 579. Common Dead Nettle with a Hemp leaf.

3. **GALEOPSIS corollâ flavâ, labio inferiore maculato.** *Flor. Lapp.* 193. Prickly Hemp Dead Nettle, with a beautiful yellow flower and purple lips.

4. **GALEOPSIS verticillis sexfloris, involucre tetraphyllo.** *Lin. Sp. Plant.* 780. Stinking Dead Nettle with a yellow flower.

These are all of them annual plants, except the fourth sort; they grow naturally in *England*. The first is found upon arable land in many places; the second grows upon dunghills, and by the side of paths, in most parts of *England*. The third sort grows chiefly in the northern counties, but I have accidentally found it growing wild in *Essex*, within ten miles of *London*. These plants are seldom cultivated in gardens, for if their seeds are permitted to scatter, the plants will come up as weeds wherever they are allowed a place.

The fourth is a perennial plant with a creeping root, which grows in the woods and under hedges in most parts of *England*.

GALEOPSIS FRUTESCENS. See *Prasium*.

GALIUM. *Lin. Gen. Plant.* 117. Ladies Bedstraw, or Cheese-rennet.

The Characters are,

The flower hath one petal, divided into four parts, and four awl-shaped stamina. It hath a twin germen situated under the flower, which afterward become two dry berries, joined together, each inclosing a large kidney-shaped seed.

The Species are,

1. **GALIUM foliis octonis linearibus sulcatis, ramis floriferis brevibus.** *Hort. Cliff.* 34. Yellow Ladies Bedstraw.

2. **GALIUM foliis octonis ovatis linearibus subserratis patentissimis mucronatis, caule flaccido, ramis patentibus.** *Lin. Sp. Plant.* 107. Branching broad-leaved Mountain Moluggo.

3. **GALIUM foliis verticillatis lineari-setaceis, pedunculis folio longioribus.** *Hort. Cliff.* 34. Narrow-leaved Mountain Ladies Bedstraw, with a black purple flower.

4. **GALIUM foliis verticillatis linearibus, pedunculis dichotomis, summo caule floriferis.** *Prod. Leyd.* 256. Rock Ladies Bedstraw with a gray leaf.

5. **GALIUM foliis verticillatis linearibus, pedunculis brevissimis.** *Hort. Cliff.* 34. Red Ladies Bedstraw.

6. **GALIUM foliis quaternis lanceolatis trinerviis glabris, caule erecto, seminibus hispidis.** *Flor. Lapon.* 60. Smooth Meadow Madder with an acute leaf.

7. **GALIUM foliis quaternis obovatis inæqualibus, caulibus diffusis.** *Flor. Suec.* 119. White Marsh Ladies Bedstraw.

The first of these plants (which is the sort commonly used in medicine) is very common in moist meadows, and in pasture grounds, in several parts of *England*. The other varieties are preserved in curious botanick gardens, but as they are plants of very little beauty, and are subject to spread very far, and over-run whatever plants grow near them, they are seldom cultivated in other gardens.

These sorts may any of them be propagated by parting their roots, which spread and increase very fast, either in the spring or autumn, and will grow almost in any soil or situation, especially the first sort; all the other sorts except the last, require a drier soil, but will all grow in any situation.

GARCINIA. *Lin. Gen. Plant.* 526. The Mangosteen.

The Characters are,

The flower hath four roundish petals, which are larger than the empalement. It hath sixteen stamina, formed into a cylinder. In the center is situated an oval germen, crowned by a buckler-shaped plain stigma, divided into eight parts, which afterward becomes a thick globular berry with one cell, including eight hairy fleshy seeds, which are convex and angular.

We know but one Species of this genus, viz.

GARCINIA. *Hort. Cliff.* 182. The Mangostan, or Mangosteen.

This tree grows naturally in the *Molucca* islands, and also in the inland parts of *New Spain*, from whence I received perfect specimens, which were sent me by Mr. Robert Millar, who gathered them near *Tolu*, but did not know the tree. It rises with an upright stem twenty feet high, sending out many branches placed opposite, which stand oblique to each other, not at right angles; the bark of the branches is smooth, of a gray colour, that on the tender shoots is green. The leaves are spear-shaped and entire, of a lucid green on their upper side, and of an Olive colour on their under, having a prominent midrib with several small veins running from that to both sides of the leaf. The flower is like that of the single Rose, composed of four roundish petals, which are thick at their base, but thinner toward their ends, of a dark red colour. The fruit, which succeeds the flower is round, the size of a middling Orange; the top is covered by a cap, which was the stigma on the top of the style; and remains to the top of the fruit, which is indented in six or seven obtuse rays. The shell of the fruit is like that of the Pomegranate, but softer, thicker, and fuller of juice; the inside of the fruit is of a Rose colour, divided into several parts by thin partitions, as in Oranges, in which the seeds are lodged, surrounded by a soft juicy pulp of a delicious flavour; it is esteemed one of the richest fruits in the world: the trees naturally growing in the form of Pyramolas, whose branches are well garnished with large shining green leaves, make an elegant appearance, and afford a kindly shade in hot countries.

There are but few of the seeds in this fruit which come to perfection (the greatest part of them are abortive) most of those which have been brought to *Europe* have failed; therefore the surest way to obtain the plants, is to sow their seeds in tubs of earth in the country, and when the plants have obtained sufficient strength, they may be brought to *Europe*; but there should be great care taken in their passage, to screen them from the spray of the sea, as also not to give them much water, especially when they arrive in a cool or temperate climate, for these plants are very impatient of wet. When the plants arrive in *Europe*, they should

should be carefully transplanted, each into a separate pot, and plunged into the tan-bed, observing to shade them from the sun till they have taken new root; then they must be treated in the same manner as other tender plants from hot countries.

GARDENS are frequently distinguished into flower-gardens, fruit-gardens, and kitchen-gardens; the first being designed for pleasure and ornament, so should be placed in the most conspicuous parts, *i. e.* next to, or just against, the back front of the house; the two latter being principally intended for use and service, are placed less in sight.

Though the fruit and kitchen-gardens are often mentioned as two distinct gardens, and have by the French gardeners, as also by some of our own countrymen, been contrived as such, yet they are now usually in one; and with good reason, since they both require a good soil and exposure, and to be placed out of the view of the house. As the kitchen-garden should be inclosed with walls, that no person may have access to it, who have no business in it, for the sake of preserving the product, so these walls will answer the purposes of both.

In the choice of a place to plant a garden, the situation and exposure of the ground are the most essential points to be regarded; since, if a failure be made in that point, all the care and expence will in a manner be lost.

The second thing to be considered in chusing a place for a garden, is a good earth or soil.

It is scarce possible to make a fine garden in a bad soil; there are indeed ways to meliorate ground, but they are very expensive; and sometimes, when the expence has been bestowed of laying good earth over the whole surface, the garden has been ruined, when the roots of the trees have come to reach the natural bottom.

The quality of good ground is neither to be stony; or hard to work; neither too dry, nor too moist; nor too sandy and light, nor too strong and clayey, which is the worst of all for gardens.

The third requisite is water. The want of this is one of the greatest inconveniencies that can attend a garden, and will bring a certain mortality upon whatever is planted in it, especially in the greater droughts that often happen in a hot and dry summer.

GARIDELLA: *Tourn. Inst. R. H. 655. tab. 430. Lin. Gen. Plant. 507.*

The Characters are,

The flower hath no petals, but five oblong equal nectariums occupy their place, which are bilabiate. It hath eight or ten awl-shaped stamina, which are shorter than the empalement. In the center is situated three compressed germina, which become three oblong compressed capsules with two valves, inclosing several small seeds.

We know but one Species of this genus, *viz.*

GARIDELLA. *Hort. Cliff. 170.* Garidella with very narrow divided leaves.

This plant is very near akin to the Nigella, or Fennel flower, to which genus it was placed by the writers on botany before Dr. Tournefort, and was by him separated from it, as differing in the form of the flower.

It grows wild in Candia, and on mount Baldus, in Italy, as also in Provence, where it was discovered by Dr. Garidel, who sent the seeds to Dr. Tournefort, for the royal garden at Paris.

This is an annual plant, which rises with an upright stalk, dividing into three or four slender branches, garnished at their joints with very narrow leaves like those of Fennel. The stalks are terminated by one small flower, of a whitish colour, which is succeeded by three capsules, each containing two or three small seeds. It flowers in June and July, and the seeds ripen in September. It is propagated by

seeds, which should be sown in autumn, on a bed of light fresh earth, where the plants are designed to remain; when the plants come up, they must be carefully cleared from weeds, and where they are too close, they must be thinned, leaving them about four or five inches apart; which is all the culture the plants require, and if the seeds are permitted to scatter, the plants will come up without any farther care.

GENISTA. *Lin. Gen. Plant. 766.* Broom.

The Characters are,

The flower is of the butterfly kind; the standard is long and wholly reflexed; the wings are a little shorter, and loose; the keel is erect, and longer than the standard. It hath ten stamina joined, which are situated in the keel. In the center is an oblong germin, which afterward becomes a roundish turgid pod with one cell, opening with two valves, inclosing kidney-shaped seeds.

The Species are,

1. GENISTA *ramis ancipitibus articulatis, foliis ovato-lanceolatis.* *Hort. Cliff. 355.* Dwarf Ance shaped Broom.

2. GENISTA *foliis lanceolatis, ramis striatis teretibus erectis.* *Hort. Cliff. 355.* Narrow-leaved Dyer's Broom.

3. GENISTA *foliis ovato-lanceolatis, ramis striatis teretibus.* Common Dyer's Broom, or Wood-waxen.

4. GENISTA *foliis inferioribus cuneiformibus, ramis floriferis linearibus, floribus majoribus erectioribus.* Greater Portugal Dyer's Broom, called Piurna by the Portuguese.

5. GENISTA *foliis lanceolatis, ramis paniculatis, caule arborescente.* Tree-like Tartarian Broom, with a yellow flower.

6. GENISTA *ramis triquetris subarticulatis, foliis tricuspidadis.* *Lin. Sp. Plant. 710.* Shrubby Portugal Dyer's Broom.

7. GENISTA *foliis lanceolatis obtusis, caule tuberculato decumbente.* *Hort. Cliff. 355.* Branching Broom with leaves like St. Johnswort.

8. GENISTA *spinis simplicibus, ramis floriferis inermibus, foliis lanceolatis.* *Hort. Cliff. 355.* Small English Broom, called Petty Whin.

9. GENISTA *spinis decompositis, ramis floriferis, inermibus, foliis linearibus pilosis.* *Lin. Sp. Plant. 711.* Most hairy small Spanish prickly Broom.

10. GENISTA *spinis compositis, ramis floriferis inermibus, foliis lanceolatis.* *Prod. Leyd. 371.* Smaller German prickly Broom.

The first sort grows naturally in France, Italy, and Germany. It sends out several stalks from the root, which spread flat on the ground, divide into many flat branches which are jointed, and their two sides are edged like a broad sword; they are herbaceous, but perennial. At each of the joints is placed one small spear-shaped leaf, without any foot-stalk. The flowers are produced in close spikes at the end of the branches, they are of the Pea-bloom kind, of a dirty yellow colour, and are succeeded by short hairy pods, which contain three or four kidney-shaped seeds.

This sort is propagated by seeds, which, if sown in the autumn, the plants will come up the following spring; but when they are sown in the spring, the plants rarely come up the same year: when the plants come up, they will require no other culture but to keep them clean from weeds, and thin them where they are too close; at Michaelmas they may be transplanted where they are designed to remain; the plants are very hardy, and will live several years.

The second sort rises with ligneous stalks two or three feet high, garnished with small spear-shaped leaves placed alternate, and are terminated by several spikes of yellow flowers, of the Pea-bloom kind, but small; which are succeeded by short pods, black when ripe, and contain four or five kidney-shaped seeds.

The third sort grows naturally in England. It hath shrubby stalks, three feet high, garnished with spear-shaped leaves,

leaves, which are broader than those of the former; the branches which come out from the side of the stalks, do not grow so upright as those of the second, but are terminated by loose spikes of yellow flowers, which are succeeded by pods like those of the second sort. The branches of the plant are used by dyers, to give a yellow colour, from whence it is called Dyer's Broom, Green-wood, Wood-waxen, or Dyer's-weed.

The fourth sort grows naturally in *Portugal* and *Spain*. This rises with shrubby channelled stalks four feet high, sending out several branches which grow erect; the lower leaves are wedge-shaped, very narrow at their base; those which are higher on the flower branches are narrow, and equal at both ends; the flowers are produced in pretty long spikes at the end of the branches, which are larger than those of the other sorts, and of a paler yellow colour; these are succeeded by pods like the former sorts.

This sort is a little tender, and in very severe frosts is sometimes killed in *England*, where the plants are not protected.

The fifth sort grows naturally in *Tartary*. This rises with a woody stalk to the height of seven or eight feet, sending out many slender branches, garnished with small spear-shaped leaves placed alternate; the upper part of these branches, for more than a foot in length, send out small branches, terminated by loose spikes of flowers, so that each branch terminates in a panicle of flowers. These appear in *June* and *July*, and the seeds ripen in autumn.

The sixth sort hath a low shrubby stalk, which seldom is more than a foot high, sending out several weak branches which are jointed, and garnished with small leaves ending in three acute parts. The flowers are produced in loose spikes at the top of the branches, of a pale yellow colour; the seeds ripen in *September*. This plant grows naturally in *Portugal*.

The seventh sort hath a shrubby stalk which declines toward the ground; it divides into a few small branches, garnished with small obtuse leaves. The flowers are disposed in small loose spikes at the end of the branches; these are small, of a pale yellow colour, and are succeeded by short pods filled with kidney-shaped seeds. This grows naturally in *Germany* and *France*.

The eighth sort grows naturally upon open heaths, in many parts of *England*. It hath a shrubby slender stalk, which rises about two feet high, sending out many weak branches, armed with long single spines, garnished with very small spear-shaped leaves, placed alternate. The flower branches have no spines, are short, and have five or six yellow flowers growing in a cluster at the end. They come out in *April* and *May*, and are succeeded by short turgid pods, which contain four or five small kidney-shaped seeds.

The ninth sort grows naturally in the south of *France* and *Italy*. This hath a shrubby stalk, and ligneous branches, armed with branching thorns, which come out from each other, but the short branches which produce the flowers have no spines, but are garnished with small hairy leaves of different forms, some of them being as narrow as hairs, and others are spear-shaped; the branches are terminated by clusters of yellow flowers, which are succeeded by short compressed hairy pods, filled with kidney-shaped seeds.

The tenth sort grows naturally in *Germany*. This rises with shrubby stalks to the height of three or four feet, divided into many slender branches, armed with compound spines, and garnished with spear-shaped leaves placed alternate; those branches which produce the flowers have no spines, but are terminated by short loose spikes of yellow flowers, which are succeeded by short pods, containing three or four kidney shaped seeds.

All these sorts of Brooms are propagated by seeds, which,

if sown in autumn, will succeed much better than if sown in the spring, and a year will be thereby saved: as these plants send out long, stringy, tough roots, which run deep into the ground, they do not bear transplanting well, especially if they are not removed young; therefore the best way is to sow a few seeds in those places where the plants are designed to remain, and to pull up all except the most promising plants as soon as they are past danger; after this the plants will require no other culture, but to keep them clean from weeds; but where this cannot be practised, the seeds may be sown thin upon a bed of light earth, and when the plants come up, they may remain till the following autumn, when they should be carefully taken up and transplanted where they are designed to remain.

They are all very hardy plants except the fourth and tenth sorts, which must have a warm sheltered situation and dry soil, otherwise they will not live through the winter, but the others will grow in almost any soil or situation.

GENISTA SPINOSA, the Furz, Whins, or Gorse. See Ulex.

GENTIANA. *Lin. Gen. Plant.* 285. Gentian, or Fell-wort.

The Characters are,

It hath a permanent empalement to the flower, cut into five acute segments. The flower hath one petal, which is tubulous. It hath five awl-shaped stamina. In the center is situated an oblong cylindrical germen, which afterward becomes an oblong taper-pointed capsule, with one cell, containing many small seeds fastened to the valves of the capsule.

The Species are,

1. GENTIANA corollis quinquefidis rotatis verticillatis, calycibus spathaceis. *Hall. Helv.* 479. Greater yellow Gentian.
2. GENTIANA corollis quinquefidis campanulatis oppositis pedunculatis, foliis linearibus. *Lin. Sp. Plant.* 228. Greater narrow-leaved autumnal Gentian.
3. GENTIANA corollis quinquefidis campanulatis oppositis sessilibus, foliis amplexicaulibus, *Lin. Sp. Plant.* 227. Gentian with a Swallow-wort leaf.
4. GENTIANA corollâ quinquefidâ campanulatâ, caulem excedente. *Lin. Sp. Plant.* 228. Broad-leaved Alpine Gentian with a large flower, commonly called Gentianella.
5. GENTIANA corollis quinquefidis infundibuliformibus, ramis unifloris alternis. *Lin. Sp. Plant.* 229. Annual Gentian with lesser Centaury leaves.
6. GENTIANA corollis quadrifidis imberbibus verticillatis sessilibus. *Lin. Sp. Plant.* 231. Crosswort Gentian.
7. GENTIANA corollis quadrifidis margine ciliatis. *Lin. Sp. Plant.* 231. Blue Gentian with hairy brims.
8. GENTIANA corollis quinquefidis hypocrateriformibus, calycibus inflatis plicatis. *Lin. Sp. Plant.* 229. Gentian with a bellied tube.
9. GENTIANA corollis quinquefidis infundibuliformibus, caule dichotomo. *Lin. Sp. Plant.* 229. Lesser Centaury.
10. GENTIANA corollis octifidis, foliis perfoliatis. *Lin. Sp. Plant.* 232. Yellow perfoliate Centaury.
11. GENTIANA corollis quinquefidis infundibuliformibus, floribus alternis sessilibus. *Lin. Sp. Plant.* 230. Lesser Centaury with a white spiked flower.
12. GENTIANA corollis quinquefidis infundibuliformibus, pedunculis longissimis. Lesser maritime Centaury with a large blue flower.

The first sort is the common Gentian of the shops, whose root is one of the principal ingredients in bitters.

This hath a large thick root of a yellowish brown colour, and a very bitter taste; the lower leaves are of an oblong oval shape, a little pointed at the end, stiff, of a yellowish green, and have five large veins on the back of each. The stalk rises four or five feet high, garnished with leaves, growing by pairs at each joint, almost embracing
the

the stalk at their base; they are of the same form with the lower, but diminish gradually in their size to the top. The flowers come out in whorls at the joints, on the upper part of the stalks, standing on short foot-stalks, whose origin is from the wings of the leaves; they are of a pale yellow, have one petal, divided almost to the bottom, and an oblong cylindrical germen, which afterward swells to an oblong taper capsule, bifid at the point, and opens in two cells, filled with small flat seeds.

It grows naturally in the pastures in *Switzerland*, and in the mountainous parts of *Germany*, from whence the roots are brought to *England* for medicinal use.

A few years ago there was a mixture of Henbane roots brought over with Gentian, which was unhappily used, and occasioned great disorders in the persons to whom it was administered.

This plant delights in a light loamy soil and a shady situation, where it will thrive much better than in an open exposure. It is propagated by seeds, which should be sown in pots soon after it is ripe, for if it is kept till the spring, it will not succeed; the pots should be placed in a shady situation. In the spring the plants will appear, when they must be duly watered in dry weather; the following autumn they should be carefully shaken out of the pots, so as not to break or injure their roots, and planted in a shady border of loamy earth, at six inches distance each way, observing to let the top of the roots be a little below the surface of the ground, then press the earth close to the roots; after this they will require no farther care, but to keep them constantly clean from weeds. In this border, the plants may stand two years, by which time they will be fit to transplant where they are designed to remain; therefore in autumn, so soon as their leaves decay, they may be removed; but as the roots of these plants run deep into the ground, like Carrots, there must be great care taken in digging them up, not to cut or break them. After the plants are well fixed in their places, they require no other culture, but to dig the ground about them early in the spring, before they begin to shoot. The roots of this plant will continue many years, but the stalks decay every autumn; the roots seldom flower oftener than every third year, but when they flower strong, they make a fine appearance; and as these delight in shady moist ground, where few ornamental plants will thrive, so they should not be wanting in good gardens.

The second sort grows naturally in moist pastures in many parts of *England*, but particularly in the north; it rises with an upright stalk about a foot high, garnished with smooth leaves, placed opposite, without foot-stalks. The flowers are produced on the top of the stalk, three or four in number, standing upon foot-stalks, alternately above each other; they are large, bell-shaped, and divided into five points at the brim, of a deep blue colour, so make a fine appearance; these come out the latter end of *July* in the warm parts of *England*, but in the north they are full a month later.

It may be propagated by seeds in the same manner as the first sort, and the plants may be treated in the same way: but as this sort doth not shoot its roots deep into the ground, it may be transplanted with less hazard; however, if these are removed with a ball of earth to their roots, they will not feel their removal so much as when the earth is all taken from them. This should be planted in strong, moist, loamy soil, in which the plants will thrive and flower annually, but in a warm dry soil they will not thrive or flower.

The third sort grows naturally upon the *Helvetian* mountains; this rises with an upright stalk a foot high, garnished with smooth leaves, which embrace the stalk, but

end in acute points; they are of a fine green, and are diminished in their size as they are nearer the top: and have five longitudinal veins, which join at both ends, but diverge from each other in the middle. The flowers come out by pairs opposite, from the bottoms of the leaves, standing on short foot-stalks; they are pretty large, bell-shaped, and of a fine blue colour, so make a fine appearance when they are open. This sort flowers in *June* and *July*.

It may be propagated by seeds in the same manner as the first sort, and the plants may be treated in the same way, but they must have a moist loamy soil, otherwise they will not thrive. It may also be propagated by offsets, which may be divided from the roots; these should be taken off in autumn, which is the best season for removing all these sorts of plants, but these should not be removed, or parted oftener than every third year, where they are expected to produce strong flowers.

The fourth sort grows naturally on the *Alps* and *Helvetian* mountains; this is commonly known by the title of *Gentianella*. It is a low plant, the stalks seldom growing more than three or four inches high; garnished with smooth leaves placed opposite, which sit close to the stalk. The flower grows erect on the top of the stalk, so stand quite above it; but sometimes, when the plants are strong, there will be two or three at the end of each stalk; they are large, bell-shaped, and of a deep-azure blue. It usually flowers in *May*, but sometimes the plants flower again in autumn.

This is commonly propagated by parting of the roots in the same manner as is before directed for the third sort, but the plants must not be often transplanted, or parted; they should have a soft loamy soil and a shady situation, where the plants will thrive and flower well every year.

It may also be propagated by seeds, which, in a good soil, the plants will produce in plenty; these should be sown in autumn, in the same manner as is before directed for the first sort, and if the plants are planted in a good soil, they will be strong enough to flower the second year after they are come up, and these seedling plants will flower much stronger than those which are propagated by offsets.

The fifth and eighth sorts are low annual plants, which grow naturally upon the *Alps*, and other mountainous places in *Europe*, and are very rarely cultivated in gardens. The fifth seldom rises more than two inches high, branching out from the root into several slender stalks, garnished with very small leaves placed by pairs; each stalk is terminated by one smaller blue flower standing erect. The eighth sort grows about four inches high, with a single upright stalk, of a purple colour. The leaves at the roots are oval, but those upon the stalk are narrow, and stand opposite. The stalk is terminated by one blue flower, with a large bellied empalement, which is plaited, and the petal of the flower rises but little above the empalement, so does not make much appearance. After the top flower decays, there are frequently two smaller flowers which come out from the side of the stalk, at the two upper joints.

As these plants usually grow upon moist spongy ground, it is very difficult to cultivate them in gardens, for unless they have a soil approaching near to that in which they naturally grow they will not thrive; the only method to obtain them is, either to sow them in pots, or upon a moist boggy ground in autumn, but it must be in the shade; and when the plants come up, they may be thinned, and the surface of the ground about them covered with moss, which should be constantly kept moist; with this management I have seen the plants thrive and flower very well.

The sixth sort is a perennial plant, which grows naturally upon the *Apennines*, and the *Helvetian* mountains; this rises with an upright stalk about six inches high, garnished with smooth

smooth spear-shaped leaves, about two inches long, and one broad in the middle, sitting close to the stalk; they are placed opposite, and each pair of leaves cross one another, from whence it is called Crosswort Gentian. The flowers are produced in whorls round the upper part of the stalks, sitting very close to them; at the top there is a large cluster growing in the same form, these are of a light blue colour. This may be propagated by seeds, or offsets, in the same manner as the third and fourth sorts, and the plants must be treated in the same way.

The seventh sort grows naturally upon the *Alps*, and other mountainous parts of *Europe*; this is a low perennial plant, whose stalks are very slender, rarely rising more than three or four inches high, garnished with small, narrow, acute-pointed leaves, placed by pairs; each stalk is terminated by one large blue flower, which is hairy on the inside at the brim. This flowers in *July* and *August*, and may be propagated in the same manner as the third and fourth sorts.

The ninth sort is the Lesser Centaury of the shops, which grows naturally upon dry pastures in most parts of *England*, where it rises in height proportionable to the goodness of the soil, for in good land it is frequently a foot high, but in poor soils not more than three or four inches. It is an annual plant, with upright branching stalks, garnished with small leaves placed by pairs. The flowers grow in form of an umbel at the top, and are of a bright purple colour; they come out in *July*, and the seeds ripen in autumn. This plant cannot be cultivated in gardens.

The tenth sort grows naturally upon chalky grounds in many parts of *England*. It is an annual plant, rising with an upright stalk a foot high, garnished with oval-pointed leaves, placed opposite, whose base surrounds the stalk; they are of a gray colour; the stalks and leaves are very smooth. The flowers grow in form of an umbel on the top of the stalk, of a bright yellow colour, cut into eight parts at the top. These appear in *July*, and the seeds ripen in autumn.

The eleventh sort is an annual plant, which grows naturally in the south of *France* and *Italy*; this rises with an upright stalk about a foot high, sending out several branches toward the top, garnished by small leaves placed opposite. The flowers are produced from the side, and at the top of the stalk, in form of loose irregular umbels; they are white, and about the size of those of the common Centaury.

The twelfth sort grows naturally in the *West-Indies*, where it was discovered by father *Plumier*, and the late Dr. *Houssoun* found it growing in plenty at *La Vera Cruz*, in low moist places where the water stagnates, but at a remote distance from the sea. This rises with an upright stalk near two feet high, garnished with oblong, smooth, acute-pointed leaves, placed opposite: the upper part of the stalk divides into six or seven long naked foot-stalks, each sustaining one large blue flower, divided into five segments at the brim. The flowers are succeeded by oblong capsules, with one cell, filled with small seeds.

This is propagated by seeds, which must be sown on a hot-bed, and the plants afterward treated in the same manner as other tender annual plants from warm countries, being too tender to thrive in the open air in *England*. If the seeds of this plant are sown in autumn, in pots placed in the tan bed of the stove, they will succeed better than when they are sown in the spring, and the plants will flower early, so good seeds may be obtained.

GENTIANELLA. See Gentiana.

GERANIUM. *Lin. Gen. Plant.* 346. Crane's-bill.

The Characters are,

The flowers have oval or heart-shaped petals, spreading open, which are in some species equal, and in others, the upper two are much larger than the three lower. It hath ten stamina,

which are alternately longer. In the bottom of the flower is situated a five-cornered germen, which is permanent. The flower is succeeded by five seeds, each being wrapped up in the husk of the beak, where they are twisted together at the point, so as to form the resemblance of a stork's beak.

The Species are,

1. GERANIUM *pedunculis bifloris, peltatis multipartitis rugosis, pinnato-laciniatis, acutis.* *Hort. Cliff.* 344. Crane's-bill with a Crowfoot leaf, and large blue flowers.

2. GERANIUM *pedunculis bifloris, calycibus inflatis, pistillo longissimo.* *Hort. Cliff.* 343. Long-rooted sweet-smelling Crane's-bill, with a Crowfoot leaf.

3. GERANIUM *pedunculis unifloris, foliis quinquepartitis trifidis orbiculatis.* *Lin. Sp. Plant.* 685. Bloody Crane's-bill with a large flower.

4. GERANIUM *pedunculis unifloris, foliis quinquepartitis laciniis obtusis brevibus, caulibus decumbentibus.* Bloody Crane's-bill with a variegated flower.

5. GERANIUM *pedunculis bifloris, foliis caulinis trilobis integris serratis, summis sessilibus.* *Hort. Cliff.* 343. Knotty Crane's-bill.

6. GERANIUM *pedunculis bifloris, foliisque alternis, calycibus subaristatis, caule erecto.* *Lin. Sp. Plant.* 681. Brown Crane's-bill with reflexed petals, and leaves not spotted.

7. GERANIUM *pedunculis bifloris, foliis quinquelobatis incisis, petalis reflexis.* Brown Crane's-bill with plain petals, and spotted leaves.

8. GERANIUM *pedunculis bifloris, foliis caulinis trilobis obtuse-crenatis, inferne hirsutis.* Roman Crane's-bill with striped flowers.

9. GERANIUM *pedunculis bifloris, foliis peltatis inciso-serratis, caule erecto.* *Flor. Lapp.* 266. Mountain Crane's-bill with a Crowfoot leaf.

10. GERANIUM *pedunculis bifloris, foliisque oppositis, petalis integris, calycibus brevioribus.* Oriental Dove's-foot Crane's-bill with an Asphodel root, and large flowers.

11. GERANIUM *pedunculis bifloris, foliisque oppositis, caule erecto ramoso, petalis bifidis.* Greatest perennial Dove's-foot Crane's-bill of the *Pyrennes*.

12. GERANIUM *pedunculis longissimis multifloris, calycibus aristatis, foliis bipinnatis.* Alpine Crane's-bill with a Coriander leaf, a long root, and a large purple flower.

13. GERANIUM *pedunculis bifloris, petalis emarginatis, foliis peltatis septempartitis trifidis, tomentoso-sericeis.* *Lin. Syst.* Silvery Alpine Crane's-bill.

14. GERANIUM *pedunculis bifloris, caule dichotomo erecto, foliis quinquepartitis incisis summis sessilibus.* *Flor. Virg.* 78. American spotted Crane's-bill with obsolete blue flowers.

15. GERANIUM *pedunculis bifloris, petalis emarginatis arillis hirtis coteledonibus trifidis, medio truncatis.* *Lin. Syst.* Lesser annual Crane's-bill of *Bohemia*, with a purple violet flower.

16. GERANIUM *pedunculis subunifloris, foliis quinquepartitis acutis, foliolis pinnatifidis.* *Lin. Sp. Plant.* 683. Crane's-bill with one flower on a foot-stalk, leaves divided into five acute parts, and the smaller leaves wing-pointed.

17. GERANIUM *pedunculis multifloris, calycibus pentaphyllis, floribus pentandris foliis pinnatis incisis obtusis.* *Hort. Cliff.* 334. Musk'd Crane's-bill, frequently called *Muscovy*.

18. GERANIUM *pedunculis bifloris, calycibus pentaphyllis, floribus pentandris, foliis pinnato-incisis crenatis.* Broad-leaved annual Crane's-bill, with a blue flower and a very long beak.

19. GERANIUM *pedunculis multifloris, calycibus pentaphyllis, floribus pentandris, foliis pinnatis acutis sinuatis.* *Lin. Sp. Plant.* 680. Crane's-bill with a Hemlock leaf, and very long beaks to the seed.

20. GERANIUM *pedunculis multifloris, calycibus pentaphyllis, floribus pentandris, foliis bipinnatis multifidis, caule erecto viscoso.* Erect viscous Crane's-bill with a Hemlock leaf, and very long beaks to the seed.

21. GERANIUM *calycibus monophyllis, foliis cuculatis dentatis*. Hort. Cliff. 345. African tree Crane's-bill with a round Marshmallow leaf, and the scent of Carline Thistle.

22. GERANIUM *calycibus monophyllis, foliis cuculatis angulosis, acutè dentatis*. African tree Crane's-bill with an angular Marshmallow leaf, and large purple flowers.

23. GERANIUM *calycibus monophyllis, foliis cordato-orbiculatis incisís zonâ notatis*. Hort. Upsal. 196. African tree Crane's-bill, with an hairy Ladies Mantle leaf and red flowers.

24. GERANIUM *calycibus monophyllis, foliis orbiculato-reniformibus tomentosis crenatis integriusculis*. Hort. Upsal. 195. African tree Crane's-bill with a plain shining Mallow leaf, and an elegant scarlet flower, commonly called Scarlet Geranium.

25. GERANIUM *calycibus monophyllis, foliis lobatis undatis villosis*. Hort. Upsal. 196. African shrubby Crane's-bill with a jagged sweet-smelling Mallow leaf, commonly called Rose-scented Geranium.

26. GERANIUM *calycibus monophyllis, foliis adscendentibus lobatis pubescentibus*. Hort. Upsal. 196. African shrubby Crane's-bill with a jagged Mallow leaf, smelling like Balm, and a purplish-coloured flower.

27. GERANIUM *calycibus monophyllis, corollis papilionaceis, vexillo dipetalo maximo, foliis angulatis*. Hort. Cliff. 345. African tree Crane's-bill, with a pointed Mallow leaf, and the under petals of the flower scarce discernible.

28. GERANIUM *calycibus monophyllis, foliis glabris subovatis carnosis crenatis*. Hort. Cliff. 345. African shrubby Crane's-bill with a thick glaucous leaf, and an acid taste like Sorrel.

29. GERANIUM *calycibus monophyllis, petalis linearibus, caule carnosio nodoso, foliis duplicato-pinnatifidis*. Lin. Vir. 67. African shrubby Crane's-bill with a leaf like the Alcea, the petals of the flower white and narrow, and a fleshy jointed stalk.

30. GERANIUM *calycibus monophyllis, caule carnosio gibboso, foliis subpinnatis*. Lin. Sp. Plant. 677. African Crane's-bill, smelling sweet in the night, with knotty tuberous stalks, and leaves like Columbine.

31. GERANIUM *calycibus monophyllis, foliis tripartitis incisís, intermedia majore, pedunculis umbelliferis geminis, caule carnosio*. Lin. Vir. 67. African Crane's-bill with a Vervain Mallow leaf, and a deep scarlet flower.

32. GERANIUM *calycibus monophyllis, foliis quinquelobis integerrimis glabris peltatis*. Hort. Cliff. 345. African Crane's-bill with the under leaves like Asarabacca, and the upper leaves like Stavescacre, shining, spotted, and tasting like Sorrel.

33. GERANIUM *calycibus monophyllis, foliis orbiculatis palmatis incisís pilosis, caule herbaceo*. Lin. Vir. 67. African Crane's-bill with a hairy Ladies Mantle leaf, and whitish flowers.

34. GERANIUM *calycibus monophyllis, caule carnosio brevissimo, ramis longis, foliis cordatis*. Hort. Cliff. 345. African Crane's-bill with a thick, soft, sweet-smelling Mallow leaf, and a small white flower composed of five leaves.

35. GERANIUM *calycibus monophyllis, foliis bipinnatis multifidis villosis, radice subrotundo*. American tuberous-rooted Crane's-bill, with a dark flower, smelling sweet in the night.

36. GERANIUM *calycibus monophyllis, foliis duplicato-pinnatifidis, radice subrotundo*. Tuberous-rooted African Crane's-bill with an Anemony leaf, and a pale flesh coloured flower.

37. GERANIUM *calycibus monophyllis, foliis decompositis villosis pinnatifidis acutis, pedunculis longissimis*. Night smelling Crane's-bill with a tuberous root, broad, woolly, hoary Carrot leaves, and a pale yellowish flower.

38. GERANIUM *calycibus monophyllis, foliis pinnatifidis villosis, laciniis linearibus*. Night smelling Ethiopian Crane's-bill with a tuberous root, and narrow Cicely leaves.

39. GERANIUM *calycibus monophyllis, tubis longissimo sub-*

fessilibus, radice subrotundâ, foliis lobatis. Prod. Leyd. 352. Night sweet smelling African Crane's-bill with a hairy Vine leaf, and a tuberous root.

40. GERANIUM *calycibus monophyllis, corollis papilionaceis, vexillo dipetalo, foliis bipinnatis*. Smaller African Crane's-bill with a Coriander leaf, and a flesh-coloured flower.

41. GERANIUM *calycibus monophyllis, corollis papilionaceis, vexillo dipetalo, foliis bipinnatis, ramis nodosis suffrutescens*. Crane's-bill with empalements of one leaf, a butterfly flower with a standard of two petals, double winged leaves, and knotty shrubby branches.

42. GERANIUM *calycibus monophyllis, foliis palmatis subrotundis crenatis, caulibus filiformibus procumbentibus*. African Crane's-bill with a Gooseberry leaf, and small reddish flowers.

43. GERANIUM *calycibus monophyllis, foliis ovatis inæqualiter serratis planis*. Lin. Sp. Plant. 679. Shrubby Crane's-bill with a broad indented leaf, and large reddish flowers.

The first sort grows naturally in moist meadows in many parts of England, but is frequently planted in gardens for the beauty of its large blue flowers; of this there is a variety with white flowers, and another with variegated flowers, but these are apt to degenerate to the common sort, if they are raised from seeds, but by parting of their roots they may be continued. It hath a perennial root, which sends up many stalks three feet high, garnished with target-shaped leaves, divided into six or seven parts, cut into several acute segments, after the manner of winged leaves, ending in many points. The flowers are produced at the top of the stalks, each foot-stalk sustaining two flowers, whose petals are large and equal; they are of a fine blue colour, and appear in May and June.

The second sort grows naturally in Germany and Switzerland; it hath a thick fleshy perennial root, from which arise several branching stalks one foot high, garnished with leaves divided into five lobes, which are again divided into many short segments, crenated on their edges. The flowers are produced at the end of the branches; each short foot-stalk sustains two flowers, so it may have the title given it by *Linæus*, though at the first appearance it seems as a many flowered foot-stalk, and strictly is so, because the naked foot-stalk sustains the whole bunch. The petals are pretty large, equal, of a fine bright purple colour; the stamina and style are much longer than the petals; the whole plant, when rubbed, emits an agreeable odour. This may be propagated and treated in the same manner as the first.

The third sort grows naturally in many parts of England; this hath pretty thick, fleshy, fibrous roots, from which arise many stalks, garnished with leaves divided into five parts, or lobes, which are again divided almost to the midrib. The flowers stand upon long hairy foot-stalks, which come out from the side of the stalk, each sustaining one flower, composed of five broad regular petals, which are of a deep purple colour. There are two varieties mentioned of this sort as distinct species, one whose stalks grow more erect, and the other hath leaves more deeper divided, but the plants which I have raised from seeds of these do not come up the same as the parent plants, so they are only seminal varieties.

It hath a perennial root, which may be parted in autumn, and thereby propagated, or it may be propagated by seeds, and the plants treated in the same manner as the first.

The fourth sort hath been supposed by some to be only a variety of the third, but is undoubtedly a distinct species. The stalks of this plant are shorter than those of the third, and spread flat on the ground; the leaves are much less, and not so deeply divided, the flowers much smaller and of a pale colour, marked with purple; it grows naturally in Lancashire and Westmoreland, where I saw it in plenty.

This may be propagated and treated in the same manner as the others.

The fifth sort is a perennial plant, of smaller growth than either of the former. It rises with branching stalks about six inches high, garnished with leaves, having three pretty broad lobes, crenated on their edges: those on the lower part of the stalks are placed opposite, upon pretty long foot-stalks, but the upper leaves sit close to the stalks and are single. The flowers are produced at the end of the stalks, standing together upon two short foot-stalks; they are of a dirty purple colour. It grows naturally in *France*. This sort may be propagated and treated in the same manner as the first.

The sixth sort grows naturally on the *Alps* and *Helvetian* mountains, and is found in some places in the north of *England*: it hath a perennial root, from which arise several stalks a foot high, garnished with leaves, which are divided into five or six lobes, lacinated on their edges; those which grow near the root, have long foot-stalks, but those on the upper part of the stalk sit close; the stalk branches out at the top into three or four divisions, each being terminated by two or three foot-stalks, sustaining two flowers of a dark purple colour, with erect petals. This may be propagated by seeds or parting of the roots, in the same manner as the first sort.

The seventh sort is very like the sixth, but the leaves are larger, the lobes shorter, broader, and not so much cut, and are marked with black; the stalks rise higher, the flowers are larger, and the petals are reflexed. This may be propagated and treated in the same manner as the first sort. It grows naturally on the *Alps*.

The eighth sort hath a perennial root, which sends up many branching stalks a foot and a half high, garnished with light green leaves; those on the lower part of the stalk have five lobes, and stand upon long foot-stalks; but those on the upper part have but three, sitting closer to the stalks, and are sharply indented on the edges; the flowers stand upon long slender foot-stalks, each sustaining two flowers composed of five obtuse petals, which are deeply indented at the top; they are of a dull white, with many purple stripes running longitudinally through them. This sort is very hardy, so may be propagated by dividing of the roots, or from seeds, in the same manner as the first sort.

The ninth sort grows plentifully in the meadows in *Lancashire* and *Westmoreland*; it hath a perennial root, which sends out three or four upright stalks about nine inches high, garnished with leaves, having five lobes, which are sawed on their edges, and placed opposite; those on the lower part having pretty long foot-stalks, but those on the upper part sit closer to the stalks. The flowers terminate the stalks, standing upon short foot-stalks, each sustaining two pretty large blue flowers, with entire petals. This may be propagated and treated in the same way as the first sort.

The tenth sort was discovered by Dr. *Tournefort* in the *Levant*; it hath a perennial root, from which arise a few weak stalks about nine inches long, garnished with leaves, divided into five lobes, which are indented at the top, and placed opposite on the stalks. The flowers stand on pretty long foot-stalks, which come out single from the joints of the stalks, each sustaining two purplish flowers with entire petals, having very short empalements. It may be propagated either from seeds, or by parting of the roots, in the same manner as the first sort, but the plants require a drier soil and a warmer situation.

The eleventh sort grows naturally on the *Pyrenean* mountains; it hath a perennial root, sending out many branching stalks a foot and a half high, garnished with round leaves, divided into many obtuse segments at the top. The flowers

are produced by pairs upon short foot-stalks, which come out at the divisions on the sides, and at the top of the stalks; they are in some of a pale purple colour, and in others white. The petals of the flowers are bifid, like those of the common Dove's-foot Crane's-bill, to which the whole plant bears some resemblance, but the stalks are erect, the leaves and flowers much larger, and the root is perennial; this will propagate itself fast enough by its scattered seeds where it has once got possession, and will thrive in any soil or situation.

The twelfth sort grows naturally upon the *Alps*. It hath a perennial root, which runs very deep into the ground. The lower leaves of the plant have very long foot-stalks, they are doubly winged and smooth. The stalk rises a foot and a half high, garnished with leaves of the same form as the lower, but smaller, and stand opposite. The flowers are purple, many growing together upon very long foot-stalks; it hath awns to the segments of the empalement. This seldom produces seeds in *England*. The plant is hardy, and lives in the open air, but as the root puts out no offsets, nor perfects seeds here, we have not been able to propagate it.

The thirteenth sort grows naturally on the *Alps*; this hath a very thick perennial root, and roundish silvery leaves, divided into many parts, standing upon pretty long foot-stalks. The flower-stalks rise about four or five inches high, garnished with one or two small leaves, like those below, which sit close to the stalk. The stalks are terminated by two pretty large pale flowers, whose petals are entire. It flowers in *June*, but rarely ripens seed here; it may be propagated by parting of the roots in the same manner as the first, and must have a shady situation.

The fourteenth sort grows naturally in *North America*; this hath a perennial root, sending out several stalks one foot high, which divide by pairs, and from the middle of the divisions come out the foot-stalks of the flowers, which are pretty long and naked, each sustaining two pale purple flowers with entire petals. The leaves are divided into five parts, which are cut on their edges, and are placed opposite. It flowers in *June*, and frequently ripens seeds, from which the plant may be propagated.

The fifteenth sort grows naturally in *Bohemia*; this is an annual plant, which sends out many stalks, dividing into several parts, garnished with leaves divided into five lobes, crenated on their edges, standing upon long foot-stalks, for the most part opposite. The flowers stand by pairs upon pretty long slender foot-stalks, which come out from the side of the stalk: they are of a fine blue colour, and are succeeded by seeds, whose capsules and beaks are black. If the seeds are permitted to scatter, there will be a supply of plants, which want no other care but to keep them clean from weeds.

The sixteenth sort grows naturally in *Siberia*. It hath a perennial root; the leaves are divided into five acute lobes, which are cut into many sharp wing-like segments on their edges, and are placed opposite upon long slender foot-stalks. The foot-stalks of the flower come out from the wings of the stalk; they are long, slender, each sustaining one pale purplish flower. It ripens seeds very well, so may be easily propagated, and will grow on any soil or situation.

The seventeenth sort is an annual plant, which is sometimes found growing naturally in *England*, but is frequently preserved in gardens for the musky odour of the leaves, which in dry weather is very strong. The leaves of this are irregularly winged, the lobes grow alternate, and are cut into many obtuse segments on their edges. The stalk branches into many divisions, and frequently declines to the ground. The flowers are produced in umbels upon short foot-stalks, which arise from the wings of the stalks;

are small, blue, and have but five stamina in each, their empalements are composed of five leaves. If the seeds are permitted to scatter, there will be a supply of plants without care, which will require no other culture, but to keep them clean from weeds.

The eighteenth sort grows naturally in *Crete*; this is an annual plant with very broad leaves, which are cut on their sides regularly, in form of winged leaves, and are crenated on their borders. The flowers are produced on pretty long foot-stalks, which come out from the wings of the stalk; they are composed of five entire blue petals, and are succeeded by the largest and longest beaks of any species of this genus yet known. It ripens seeds very well, and if they are permitted to scatter, the plants will come up without care; or they may be sown in the spring, where they are designed to remain.

The nineteenth sort grows naturally in *Germany* and *Italy*. It is an annual plant, with several prostrate stalks a foot long, garnished with winged leaves, cut in several acute parts placed opposite. The flowers come out from the wings of the stalk, upon pretty long foot-stalks; some sustaining many flowers, others have no more than two; they are of a pale blue colour, and are succeeded by very long beaks, but not so long or large as those of the former sort. The seeds of this and the former sort are frequently used for hygrometers, to shew the moisture of the air; if the seeds of this are permitted to scatter, the plants will come up and thrive without any other care than to keep them clear from weeds.

The twentieth sort is an annual plant, which hath upright stalks two feet high, garnished with double winged leaves, ending in many points; the whole plant is viscous. The flowers are produced on long naked foot-stalks, standing many together upon each; they are of a pale blue colour, and have but five stamina; their empalements are composed of five leaves, which end with awns. This requires no other culture than the two former sorts.

There are several other sorts of annual Geraniums, some of which grow naturally in *England*, and are troublesome weeds in a garden; others grow naturally in *France*, *Spain*, *Italy* and *Germany*, and are preserved in botanick gardens for the sake of variety, but as they are plants of little beauty, they are rarely admitted into other gardens, therefore I shall not trouble the reader with an enumeration of the species, which would swell this article too much.

The twenty-first sort grows naturally at the *Cape of Good Hope*; it rises with a shrubby stalk eight or ten feet high, sending out several irregular branches, garnished with roundish leaves, whose sides are erect, so form a sort of a hood by a hollow cavity made in the leaf. The base of the leaves is cut in form of a heart-shaped leaf, and from the foot-stalk run many nerves arising from a point, but diverge toward the sides; the borders of the leaves are sharply indented, those on the lower part of the branches have long foot-stalks, but those on the upper part have shorter and stand opposite. The flowers are produced in large panicles on the top of the branches; their empalements are of one leaf, deeply cut into five segments, and closely covered with hairs. The petals are large, entire, and of a blue colour. The flowers are succeeded by seeds with short hairy beaks.

The twenty-second sort has some appearance of the twenty-first, but the leaves are of a thicker substance, divided into many acute angles, and have purple edges which are acutely indented. The stalks and leaves are very hairy. The branches are not so irregular as those of the former, nor are the bunches of the flowers near so large; these differences are permanent in the plants which are raised from seeds, so it is undoubtedly a distinct species.

The twenty-third sort comes from the *Cape of Good Hope*, but is one of the oldest, and the most common sort in the *English* gardens; it rises with a shrubby stalk five or six feet high, and divides into a great number of irregular branches. The branches are garnished with roundish heart-shaped leaves, indented on their edges with several obtuse segments, which are cut in short teeth at their brims; these have a purple circle, or mark, like a horseshoe, through the leaf, going from one side of the base to the other, corresponding with the border of the leaf; the leaves, when gently rubbed, have a scent like scalded Apples. The flowers are produced in pretty close bunches, standing upon long foot-stalks, which come out from the wings of the stalk, toward the end of the branches; they are of a reddish purple colour, and continue in succession great part of summer; there are three or four varieties of this, one with fine variegated leaves, one with crimson, and another with Pink-coloured flowers, which have been accidentally raised from seeds.

The twenty-fourth sort grows naturally at the *Cape of Good Hope*; this rises with a soft shrubby stem to the height of eight or ten feet, sending out several branches, which are generally erect; garnished with roundish kidney-shaped leaves, of a thick substance, and a lucid green, standing on pretty long foot stalks; they are covered with soft hairs on their under side. The flowers grow in loose bunches upon long stiff foot-stalks, which come out from the wings of the stalk; they are of a bright scarlet colour, so make a fine appearance, and there is a succession of these flowers during all the summer months.

The twenty-fifth sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby stalk four or five feet high, dividing into several weak irregular branches, garnished with leaves divided into three unequal lobes, which are hairy and waved on their edges, placed alternate on the branches, and stand upon hairy foot-stalks. The flowers grow in close roundish heads on the top of the foot-stalks, forming a sort of corymbus; they are of a purplish blue colour, and continue in succession great part of the summer. The leaves of this sort, when rubbed, have an odour like dried Roses, from whence many have given it the title of Rose Geranium.

The twenty-sixth sort is a native of the *Cape of Good Hope*; this rises with an upright shrubby stalk seven or eight feet high, sending out many pretty strong branches, garnished with leaves shaped somewhat like those of the Vine; those on the lower part stand upon long foot stalks, but the upper have short ones; when the leaves of this are rubbed, they have a scent of Balm. The flowers grow in compact clusters on the top of long naked foot-stalks, which come out from the wings of the stalk; they are small, and of a pale blue colour, so make no great figure.

The twenty-seventh sort rises with an upright shrubby stalk seven or eight feet high, sending out several side-branches, garnished with large, angular, rough leaves, standing upon long foot-stalks. The flowers are produced in large panicles at the end of the branches, which are shaped somewhat like a Butterfly flower; the two upper petals, which are pretty large, turn upward like a standard in the leguminous flowers; these are finely variegated, but the three under petals are so small, as not to appear at a little distance; these are reflexed downward, so are screened from sight, unless the flowers are viewed near. This sort flowers in *May*, at which time the plants make a fine appearance, but they are not succeeded by any more afterward, as most of the other sorts are.

The twenty-eighth sort is from the same country; this rises with a shrubby stalk six or seven feet high, sending out several side branches, garnished with oblong, oval,

fleshy, smooth leaves, of a gray colour, crenated on their edges, and have an acid flavour like Sorrel. The flowers stand upon pretty long foot-stalks, which arise from the wings of the stalks, each sustaining three or four flowers, whose petals are narrow, and unequal in size; they are of a pale bluish colour, with some stripes of a light red; these continue in succession most part of the summer. There is a variety of this with scarlet flowers, which is said to have been raised from the seeds of this sort. The leaves of it are larger, and seem to be an intermediate species between this and the twenty-fourth sort, for the flowers are larger than those of the twenty-eighth sort, and are of a pale scarlet colour.

The twenty-ninth sort hath a thick, fleshy, knotted stalk, which rises about two feet high, sending out a few slender fleshy branches, garnished thinly with double winged leaves, which, on the lower part of the stalk, stand upon foot-stalks, but those above sit close to the branches. The flowers are produced in small clusters at the end of the branches; these have five narrow white petals, which make no appearance.

The thirtieth sort hath a round fleshy stalk with swelling knots at the joints, which rise about three feet high, sending out several irregular branches, which are smooth, thinly garnished with smooth, fleshy, winged leaves, ending in obtuse points, of a gray colour, and stand upon short foot-stalks. The flowers stand four or five upon each foot-stalk, which arises from the wings of the stalk, and are of a dark purple colour. The petals are broader than those of the former sort, and the flowers have a very agreeable scent in the evening, after the sun has left them some time.

The thirty-first sort hath a fleshy stalk, which seldom rises a foot high, and puts out very few branches; which are garnished with smooth, light, green leaves, divided into three lobes, the middle segment being much larger than the others. The flowers stand upon short foot-stalks, each sustaining two or three flowers on the top, which are of a very deep scarlet colour, and have unequal petals. The leaves of this sort fall off, so that the stalks are frequently destitute of them for three or four months in the summer, and appear as if they were dead, but in autumn they put out fresh leaves again.

The thirty-second sort hath many long, weak, shrubby stalks, which require support to prevent their falling on the ground; garnished with fleshy leaves, divided into five obtuse lobes, which are entire, and have slender foot-stalks, which are fastened to the middle of the leaf, like the handle of a target. The leaves have a circular purple mark in their middle, and have an acid flavour. The flowers are produced upon pretty long foot-stalks, which come out from the wings of the stalk, each foot-stalk sustaining four or five purple flowers, composed of five unequal petals.

The thirty-third sort sends out several herbaceous stalks a foot and a half long, which trail upon the ground, if they are not supported; and are garnished with roundish hand-shaped leaves, which are hairy, and cut into many parts. The flowers are of a pale bluish colour, standing several together upon very long foot-stalks; there is a succession of these during all the summer months, and the seeds ripen accordingly about a month after the flowers are fallen.

The thirty-fourth sort hath a very short fleshy stalk, which divides near the ground into several heads, each garnished with many leaves, which arise on separate foot-stalks from the heads; they are heart-shaped, soft, and downy, and have a strong scent like Aniseed; from these heads come out several slender stalks, which lie prostrate on the ground, garnished with rounder leaves than those near the root, but are of the same texture, and have the like odour. The flowers are produced from the side of these stalks, three,

four, or five, standing together upon slender foot-stalks; they are very small and white, so make little appearance.

The thirty-fifth sort hath a thick, roundish, tuberous root, from which arise several hairy leaves, which are finely divided, almost like those of the garden Carrot; these spread near the ground, and between them come out the stalks, which rise about a foot high, garnished with two or three leaves of the same sort with those below, but are smaller, and sit closer to the stalks; from these arise two or three naked foot-stalks, which are terminated by a truss of yellowish flowers, marked with dark purple spots, which smell very sweet after the sun hath left them; these are frequently succeeded by seeds, which ripen in autumn. It is known by the title of *Geranium noctu olens*, or Night-scented Crane's-bill.

The thirty-sixth sort hath a knobbed tuberous root like the last, from which come out several pretty large leaves, composed of many lobes, set along the midrib in the form of a winged leaf, which are narrow at the base, but are very much enlarged at their ends, where they are rounded and cut into many acute points; the stalks which sustain the flowers, arise immediately from the root, and sometimes have one or two small leaves toward the bottom, where they often divide into two naked foot-stalks, each being terminated by a truss of pale red flowers, which smell sweet at night.

The thirty-seventh sort hath oblong tuberous roots, from which come out several decompound winged leaves, ending in many acute points; the segments of these leaves are broader than those of the thirty-fifth sort, the leaves are very hairy. The stalks rise a foot and a half high, garnished with a single leaf at the two lower joints; these are singly winged, the lobes are narrow, standing at a wider distance, and the segments are more acute than those of the lower leaves; at the two lower knots, or joints, arise two long naked foot-stalks, each being terminated by a truss of yellowish flowers, which have long tubes, and smell sweet in the evening when the sun has left them.

The thirty-eighth sort hath a tuberous root like the former, from which spring out many hairy leaves, which are finely divided like those of the Pulsatilla, which are very hoary, and rise immediately from the root. The foot-stalk of the flower is naked, and rises from the root; this grows about nine inches high, and is terminated by a loose truss of flowers, which are of a very dark purple colour, and smell sweet in the evening.

The thirty-ninth sort hath fleshy tuberous roots like those of the former sorts, from which come out three or four broad hairy leaves, divided on their borders into several lobes, in form of a Vine leaf; which spread flat on the ground, crenated on their edges, standing upon short foot-stalks. The foot-stalks of the flowers are naked, and arise immediately from the root, and grow about a foot high, terminated by a truss of dark purple flowers with long tubes, which have a very agreeable odour in the evening.

The fortieth sort is an annual plant, which grows naturally at the *Cape of Good Hope*; it rises with herbaceous branching stalks a foot high, garnished with doubly winged leaves at each joint; the lower leaves stand upon long foot-stalks, but those on the upper part sit close to the stalks. The flowers stand upon naked foot-stalks, which proceed from the side of the stalks, on the opposite side to the leaves; they grow three or four together upon short separate foot-stalks, and are shaped somewhat like a papilionaceous flower; the two upper petals, which are large, form a kind of standard, the other three petals are narrow, and reflexed downward; they are of a pale flesh colour; the seeds ripen in autumn, soon after which the plants decay.

The forty-first sort hath a pretty thick tuberous root, from which is sent out several irregular stalks, dividing into diffused branches, with swelling joints, which are ligneous; garnished with one double winged leaf at each of the joints, and opposite to the leaves come out the foot-stalks of the flowers; those which are situated on the lower part of the stalk, are very long and naked, but those which terminate the branches are shorter, and have one or two small leaves set at their base; the foot-stalks are terminated by a small truss of flowers, shaped like those of the former sort, but larger, and of a paler colour, which continue in succession most part of the summer.

The forty-second sort is a biennial plant, which grows naturally at the *Cape of Good Hope*; this sends out a great number of very slender trailing stalks, which lie prostrate on the ground, and extend a foot and a half in length, garnished with small, roundish, hand-shaped leaves, crenated on their edges. The flowers are very small, red, and sit upon short slender foot-stalks, which come out at every joint from the side of the stalks; sometimes they are single, and at other times there are two or three flowers upon a foot-stalk. They continue in succession all the summer, and the seeds ripen in about five weeks after the flowers decay.

The forty-third sort hath a shrubby stalk, which rises to the height of four or five feet, sending out several branches, garnished with oblong leaves, indented, and unequally sawed on their edges; the flowers stand upon long foot-stalks, which come out from the side of their branches; they are large, of a red colour, and the two upper petals are larger than the other.

All the sorts of *African Crane's-bill* may be propagated by seed, which should be sown upon a gentle hot-bed toward the middle of *March*, which will bring up the plants in a month or five weeks; afterward they should be gradually hardened to bear the open air, so as not to draw them up weak; when the plants are fit to remove, they should be put into separate small pots, and placed under a common frame, where they should be shaded from the sun till they have taken new root. In the middle of *May*, they should be removed to a sheltered situation with other exotic plants. If these plants are brought forward in the spring, most of the sorts will flower the same summer, and the plants will be very strong before the winter, so will make a better appearance in the green-house.

All the shrubby *African Geraniums*, from the twenty-first to the thirty-second inclusive, and also the forty-first and forty-third sorts, are commonly propagated by cuttings, which, if planted in a shady border, in *June* or *July*, will take good root in five or six weeks, and may then be taken up and planted into separate pots, placing them in the shade till they have taken new root; after which they may be removed into a sheltered situation, and treated in the same manner as the seedling plants. The twenty-ninth, thirtieth, thirty-first and thirty-second sorts, have more succulent stalks than either of the other, so the cuttings of these sorts should be planted in pots filled with light kitchen-garden earth, and plunged into a very moderate hot-bed, where they should be shaded from the sun in the heat of the day, and should have but little water, for these are very apt to rot with much moisture; when these are well rooted they may be separated and planted in pots, and placed in the shade till they have taken new root, then they may be removed into a sheltered situation, where they may remain till autumn. These four sorts should be sparingly watered at all times, but especially in winter, for they are apt to take mouldiness with moisture, so will thrive much better in an airy glass-case, where they may have more sun and air, than in a green-house. All the other shrubby sorts are pro-

per furniture for the green-house, where they will only require protection from frost, but should have a large share of free air when the weather is mild. These plants should be hardened in the spring gradually, and in the middle of *May*, they may be taken out of the green-house, and at first placed in the shelter of hedges, where they may remain a fortnight or three weeks to harden, then should be removed into a situation where they may be defended from strong winds, and enjoy the morning sun till eleven o'clock, where they will thrive better than in a warmer situation.

The compost in which I have always found these plants thrive best (where there has not been a conveniency of getting some good kitchen-garden earth) was fresh hazel loam from a pasture mixed with a fifth part of rotten dung; if the earth is inclinable to bind, then a mixture of rotten tan is preferable to dung, but if it is light and warm, then a mixture of neat's dung is best; this compost should be mixed three or four months before it is used, and should be turned over three or four times, that the parts may be well mixed and incorporated; but where a quantity of good kitchen-garden earth can be had, which has been well worked and is clean from the roots of bad weeds, there will need no composition, for in that they will thrive full as well as in any mixture which can be made for them, especially if the earth has laid in a heap for some time, and has been two or three times turned over to break the clods, and make it fine.

The thirty-third sort hath herbaceous stalks, so is best propagated by seeds, which the plants produce in great plenty, but the cuttings of this will take root as freely as either of the other, but the seedling plants are preferable to those propagated by cuttings; and where the seeds of this and many other of the *African* sorts are permitted to scatter, there will be a supply of young plants come up the spring following, provided the seeds are not buried too deep in the ground.

The thirty-fourth sort may be propagated by seeds, or from heads slipped off from the short fleshy stalk; these heads should have their lower leaves stripped off, that the stalk which is to be planted may be clear of them; then they may be planted each into a small pot, but if the heads are small, there may be two or three put into one small pot; then they should be plunged into a very moderate hot-bed, and shaded from the sun, which will forward their putting out roots; then they must be hardened gradually, and removed into the open air, where they may remain till autumn, when they must be removed into shelter for the winter season.

The thirty-fifth, thirty-sixth, thirty-seventh, thirty-eighth, and thirty-ninth sorts, are generally propagated by parting of their roots; the best time for doing this in *August*, that the young roots may be established before the cold comes on. Every tuber of these roots will grow, provided they have a bud or eye to them; these may be planted in the same sort of earth as was before directed, and if the pots are plunged into an old tan-bed, under a good frame, in winter, the plants will thrive better than in a green-house; the glasses of the frame may be drawn off every day in mild weather, whereby the plants will enjoy the free air, and if in hard frost, they are well covered to prevent the cold penetrating to the plants, it is all the shelter they will require; in this situation they should have but little wet in winter, therefore the glasses should be kept over them in heavy rains to keep them dry; in mild weather the glasses may be raised on the upper side to admit fresh air to the plants, which will give them greater slope to carry off the wet. With this management the roots will thrive and flower very strong every year. These sorts may also be propagated by seeds.

The fortieth sort is an annual plant, and is only propagated by seeds, which should be sown upon a gentle hot-bed in the spring, to bring the plants forward, otherwise, if the season should not prove very warm, the plants will not perfect their seeds in this country. When the plants are come up, and grown strong enough to remove, they should be each planted into a separate small pot, and plunged into a moderate hot-bed again, shading them till they have taken new root; then they must be gradually hardened to bear the open air, into which they should be removed in *June*, and shifted into larger pots; the plants will flower in *July*, and the seeds ripen in autumn, and soon after the plants will decay.

The forty-second sort is also propagated by seeds, which may be either sown upon a moderate hot-bed in the spring, or upon a bed of light earth in the open air, where the plants will come up very well, though they will not be so forward as those on the hot-bed. Those which are sown in the open air will require no other care, but to keep them clean from weeds, and thin the plants where they are too close. These plants will flower in *July* and *August*, and if the autumn proves favourable the seeds will ripen in *September*, but if these should fail, those which were raised on the hot-bed will come earlier to flower, so there will be no danger of their perfecting seeds.

GERMANDER. See *Teucrium*.

GESNERA. *Plumier Nov. Gen. 27. tab 9.*

The Characters are,

The flower hath one petal, which is tubulous and first bent inward, and afterward out again like a bugle horn; the brim is divided into five obtuse segments; it hath four stamina, which are shorter than the petal; the germen which sits under the petal, afterward becomes a roundish capsule with two cells, filled with small seeds, which are fixed on each side the partition.

The Species are,

1. GESNERA foliis lanceolatis crenatis hirsutis, pedunculis lateralibus longissimis paniculatis. Gesnera with a large woolly Fox-glove leaf.

2. GESNERA foliis lanceolatis serratis sessilibus, pedunculis ramosis multifloris. *Lin. Sp. Plant. 612.* Low Gesnera with a yellowish flower.

The first sort grows naturally in *Jamaica*; this rises with a shrubby stalk six or seven feet high, and divides into two or three irregular branches, covered with a russet wool, garnished with hairy leaves which are seven or eight inches long, and two and a half broad in the middle, with a russet woolly midrib; the edges are crenated, and they have short foot-stalks; towards the end of the branches come out the foot-stalks of the flowers at the joints, arising from the wings of the stalk; which are naked, branching at the top into many smaller foot-stalks, each sustaining a single flower with a short crooked tube, indented at the top in five obtuse segments of an obsolete purple colour. These are succeeded by roundish capsules sitting close in the empalement, the divisions of which arise above the capsule, which is divided into two cells, filled with small seeds. It flowers in *July* and *August*, but hath not ripened seeds in *England*.

The second sort is a plant of humbler growth, this seldom rises more than three feet high; the leaves are much smaller, sawed on their edges, and sit close to the stalk; the flowers stand upon branching foot-stalks, each sustaining many yellowish flowers, which are deeper cut at their brims than those of the first sort. It grows naturally at *Carthagena* in *New Spain*.

These plants are propagated by seeds, which should be sown in pots and plunged into a hot-bed of tanners bark, as soon as they arrive in *England*, for they sometimes lie long in the ground; those which I have sown in autumn,

came up the following spring; therefore when they happen to arrive here at that season, the pots in which the seeds are sown, should be plunged into the tan-bed in the stove, and during the winter the earth should be now and then gently watered, to prevent its drying too much, but it must not be too moist. In the spring the pots should be removed out of the stove, and plunged into a fresh hot-bed, which will bring up the plants soon after. When these are fit to remove, they should be each planted into a separate pot, and plunged into a good hot-bed of tan, observing to shade them till they have taken new root, then they must be treated in the same way as other tender plants from the same countries.

In autumn they must be plunged into the tan-bed in the stove, where they must constantly remain, for they will not thrive out of the tan-bed. In the summer they should have free air admitted to them, at all times when the weather is warm. As the plants advance in growth they will require larger pots, but there must be care taken not to over-pot them, for they will not thrive in large pots.

GEUM. *Lin. Gen. Plant. 561.* Avens, or Herb-Bennet.

The Characters are,

The flower has five roundish petals, which are narrow at their base, where they are inserted in the empalement, and a great number of awl-shaped stamina, which are the length of the empalement, into which they are inserted. In the center of the flower is situated a great number of germen collected into a head, which afterward become so many flat, rough, hairy seeds, with the style which is bent like a knee adbering to them.

The Species are,

1. GEUM floribus erectis, fructu globofo, aristis uncinatis nudis, foliis lyratis. *Hort. Cliff. 195.* Common Avens or Herb Bennet.

2. GEUM floribus nutantibus, fructu oblongo, aristis plumosis. *Hort. Cliff. 195.* Aquatick Herb Bennet with a nodding flower.

3. GEUM floribus nutantibus, fructu globofo, aristis nudis, foliis lyratis, foliolis rotundioribus. Pyrenean Avens with a very large and rounder leaf, and a nodding flower.

4. GEUM flore erecto solitario, fructu oblongo, aristis plumosis. *Lin. Sp. Plant. 501.* Mountain Avens with a large yellow flower.

5. GEUM flore solitario erecto, fructu globofo, aristis tenuioribus nudis. Smaller Alpine Avens.

6. GEUM floribus erectis, fructu globofo, aristis uncinatis nudis, foliis ternatis. *Hort. Cliff. 195.* Virginia Avens with a smaller white flower, and a scentless root.

The first sort grows plentifully by the side of hedges, and in woods in most parts of *England*, so is rarely admitted into gardens. This stands in the list of medicinal plants, the root is the only part used; it is esteemed cephalick and alexipharmick, and is manifestly of a binding nature, so is useful in all fluxes, &c.

The second sort grows naturally in moist meadows in the northern parts of *England*. This is of humbler growth than the first; the lower leaves have two pair of small lobes at bottom, and three large ones at the top, that which terminates being the largest. The leaves upon the stalks, are composed of three acute lobes which sit close to the stalk; the flowers are of a purplish colour, and nod on one side; they appear in *May*, and the seeds ripen in *July*.

The third sort grows upon the *Alps*, and also on the mountains in the north; this hath some resemblance to the second sort, but the leaves are much larger and rounder, and are indented on their edges; the flowers are larger and of a gold colour. This flowers about the same time as the second.

The fourth sort grows naturally upon the *Alps*; this hath leaves much larger than either of the other species; the lower

lower leaves are composed of three or four pair of small irregular pinnæ set along the midrib, which is terminated by one very broad roundish lobe, crenated on the edge. The flowers are large, of a bright yellow colour, standing single on the top of the stalk, which seldom rises more than five or six inches high. It flowers in *May* and *June*.

The fifth sort grows naturally on the *Alps*; it is a very low plant, the flower-stalks are about three inches long, and bend on one side; they are each terminated by one bright yellow flower, about the size of those of the common sort. This flowers about the same time as the former.

The sixth sort grows naturally in *North America*; the stalks of this sort rise two feet and a half high, and branch out at the top into small foot-stalks, each being terminated by a small white flower; the leaves of this sort are trifoliate, and the root has no scent. These are all very hardy plants which require a shady situation, but will thrive in any soil; they may be easily propagated by seeds which should be sown in autumn, for when they are sown in the spring, they do not grow the same year.

GILLIFLOWER, or JULY-FLOWER. See *Dianthus*.

GILLIFLOWER, or STOCK-GILLIFLOWER. See *Cheiranthus*.

GILLIFLOWER, the Queen's, or Dame's Violet. See *Hesperis*.

GINGER. See *Amomum*.

GINGIDIUM. See *Artedia*.

GLADIOLUS. *Lin. Gen. Plant.* 55. Cornflag.

The Characters are,

The flowers are included in sheaths; the petal of the flower is cut into six parts, and form a short incurved tube with their base; they have three awl-shaped stamina, which are inserted into every other petal. The germen is situated below the flower, which afterward becomes an oblong, swelling, three-cornered capsule, with three cells, filled with roundish seeds.

The Species are,

1. *GLADIOLUS foliis ensiformibus, floribus distantibus. Lin. Sp. Plant.* 36. Cornflag with flowers disposed on one side the stalk.

2. *GLADIOLUS foliis ensiformibus, utrinque floribus.* Cornflag with flowers on each side the stalk.

3. *GLADIOLUS foliis ensiformibus, spathis maximis.* Greater Cornflag of *Byzantium*.

4. *GLADIOLUS foliis ensiformibus, floribus maximis incarnatis.* Greatest Indian Cornflag.

5. *GLADIOLUS foliis linearibus, floribus distantibus, corollarum tubo limbis longiore. Lin. Sp. Plant.* 37. Cornflag with very narrow leaves, flowers standing at a distance from each other, and the tube longer than the margins of the petal.

6. *GLADIOLUS foliis linearibus sulcatis, caule biflorâ, tubo longissimo, segmentis æqualibus.* Cornflag with very narrow channelled leaves, and a stalk bearing two flowers with a very long tube, and equal segments.

The first sort grows naturally in arable land, in most of the warm countries in *Europe*, and was formerly cultivated in the *English* gardens, where the roots have multiplied so greatly as to become a most troublesome weed, and is very difficult to eradicate; this hath a round, compressed, tuberos root, which is of a yellowish colour, and covered with a brown furrowed skin, like those of the large yellow vernal *Crocus*; from the root arise two flat sword-shaped leaves, which embrace each other at their base, and between these arise the flower-stalk, which grows near two feet high, having one or two narrow leaves embracing it like a sheath; the stalks are terminated by five or six purple flowers, standing above each other at some distance, and ranged on one side of the stalk; each of these has a spatha (or sheath) which covers the flower bud before it expands,

but splits open lengthways when the flowers blow, and shrivel up to a dry skin, remaining about the seed vessel till the seeds are ripe. The flower hath one petal, which is cut almost to the bottom in six parts, so as to appear like a flower of six petals; the three upper segments stand near together, and rise like a labiated flower; the under one turns downward, and the two side segments form the chaps of the flower, and spread open at the top, but are curved downward at the bottom. They are of a purplish red colour: it requires no care, for when it is once planted in a garden, it will multiply too fast, so as to become a troublesome weed.

There is a variety of this with white flowers, and another with flesh-coloured flowers, which have accidentally risen from seeds, so are not different species.

The second sort differs from the first, in having the flowers ranged on both sides the stalk, but in other respects, it is very like to that. Of this there is a variety with white flowers, but these are not so common in the *English* gardens as the former.

The third sort hath larger roots than either of the former, but are of the same form; the leaves are also much broader and longer, the veins or channels of the leaves are deeper; the flower-stalks rise higher; the flowers are much larger, and of a deeper red colour, than those of the former sorts, and the sheaths are longer. This plant makes a fine appearance when in flower, so is worthy of a place in every good garden. This is propagated by offsets, which are sent off from the roots, in the same manner as *Tulips*, in great plenty. The roots may be taken out of the ground in the end of *July*, when their stalks decay, and may be kept out of the ground till the latter end of *September*, or the beginning of *October*, at which time they should be planted in the borders of the flower-garden; they will thrive in any situation, and being intermixed with other flowers of the same growth, they will add to the variety.

The fourth sort grows naturally at the *Cape of Good Hope*. This has been many years cultivated in the *English* gardens, but very rarely flowers here; for in near thirty years that I have cultivated this sort, I have never seen it but once in flower, though I have kept it in all situations, and planted it in various soils. The roots of this sort are broader and flatter than those of any of the other sorts, and are covered with a netted skin; the leaves come out in the same manner, embracing each other as the former sorts; they are longer, smoother, and of a brighter green, than any of the others; these begin to appear in *September*, and continue growing in size till after *Christmas*, and begin to decay in *March*; by the latter end of *May* are quite withered, when the roots may be taken up, and kept out of the ground till *August*; the time of it's flowering is in *January*. The flowers of this sort are placed on each side the stalk, and sit close to it, like the grains of the flat *Barley*; the sheaths between the flowers are not so long as those of the other sorts, and form a kind of scaly covering to them. The flowers are of a pale red colour without, but the three lower segments are yellowish within, with a few stripes of red. The flowers do not all open at the same time, but the lower ones decay before those on the upper part of the spike are in beauty; however, they make a fine appearance at a season when all flowers are valuable.

This sort propagates by offsets very fast; these should be planted in pots, and in winter they must be protected from frost, but they do not require any artificial warmth. I have always found that those plants which were hardily treated, grew much stronger than those which were placed in a moderate degree of warmth; so that where there is a conveniency of covering a warm border with glasses in the winter, if these roots are planted in the full ground, where they

they may be protected from the frost, there will be a greater probability of their flowering, than in any other method of culture.

The fifth sort grows naturally at the *Cape of Good Hope*.

This hath a round, smooth, bulbous root, which is covered with a thin dark coloured skin, from which come out in autumn two or three very narrow grassy leaves, folded over each other at their base, but open flat above; these rise near two feet high. In the spring arises a single stalk from between the leaves, about two feet long, which always bends on one side; toward the upper part of this come out two or three flowers, ranged on one side of the stalk, standing upright, each having a narrow spatha, or hood, with long slender tubes, which swell large upward, and are divided into six almost equal parts. The flower is of a dusky flesh-colour, and each segment of the petal has a rhomboidal mark of a dark red, or purple colour; afterward the tube of the flower opens, and the deep division of the petals is seen, and the three stamina, with their summits, appear, attended by the style with its trifid stigma, arising from the germen. This plant requires protection from the frost in winter, therefore the bulbs should be planted in pots, or in a border where the roots may be kept from frost in winter; or, where there is not such conveniency, they may be put under a hot-bed frame during that season, where they may have air in mild weather, and be screened from the frost; in such situations I have had them thrive and flower very well.

This is propagated by offsets from the root, in the same manner as the last, and also by seeds, which are frequently perfected in *England*, which should be sown the latter end of *August*, in pots, and placed in a shady situation till the middle of *September*; then the pots should be removed where they may have the sun great part of the day, and in *October* they must be placed under a hot-bed frame, where they may be protected from frosts and great rains, but enjoy the free air in mild weather. In *May*, when the danger of frost is over, the pots should be removed to a sheltered situation, where they may have the morning sun till noon. Toward the latter end of *June*, the leaves of these plants will decay, then the roots should be taken up, and may be mixed with sand, and kept in a dry room till the end of *August*, when they should be planted again, and as the roots are small, four or five may be planted into each halfpenny pot, and treated in the same way as the old roots.

The sixth sort is also a native of the *Cape of Good Hope*; the root of this sort is oval, not compressed as those of the other. The leaves are very long and narrow, having two deep furrows running the whole length, the middle one rising very prominent, so as to have the appearance of a four-cornered leaf. There are seldom more than two of these leaves arising from one root; the stalk is slender and round, and rises about two feet high; the top is garnished with two flowers, which are placed about two inches and a half asunder on the same side of the stalk, each having a short spatha, or sheath, embracing the germen and the base of the tube, which is long, narrow, and recurved, but enlarges greatly before it is divided. The upper part of the flower is cut into six equal segments, which end in acute points of a purplish colour, which form a stripe through the middle of each segment. The petal is of a cream colour, and fades to a sulphur colour before it decays. This may be propagated by offsets from the root, or by seeds, in the same manner as the fifth sort, and the plants require the same treatment.

GLASTENBURY THORN. See *Mespilus*.

GLAUCIUM. See *Chelidonium*.

GLAUX, Sea Chickweed, or Milkwort, and by some black Saltwort; it is a low, trailing, perennial plant, with

leave somewhat like Chickweed, but of a thicker consistence, which sit close to the stalks. The flowers come out from the bosom of the leaves, they are white, and like those of Chickweed. This is seldom cultivated in gardens, so I shall not trouble the reader with a further account of it. It grows upon the sea-shores in most parts of *England*.

GLECHOMA, Ground Ivy, Gill go by the Ground, Ale Hoof, or Turn Hoof.

This plant grows naturally under hedges, and upon the sides of banks in most parts of *England*, so is rarely cultivated in gardens, for which reason I shall pass over it, with barely mentioning it here.

GLEDITSIA. *Lin. Gen. Plant.* 1025. Honey Locust, or three-thorned Acacia.

The Characters are,

It hath male and hermaphrodite flowers on the same plant, and female flowers in different plants. The male have a three-leaved empalement, and three roundish petals, with a turbinated nectarium; they have six stamina, terminated by compressed summits. The hermaphrodite flowers have quadrifid empalements, with four petals, and six stamina; and have a germen, style, and pods, like the female, which are situated on different trees; these have a five-leaved empalement, and five petals, with two nectariums, and a broad germen longer than the petals, which afterward becomes a large flat pod, with several transverse partitions, having a pulp in each division, surrounding one hard roundish seed.

The Species are,

1. GLEDITSIA *spinis ternatis, foliis pinnatis, siliquis latis longissimis caule arboraeo*. Gleditsia with three Thorns, winged leaves, very long broad pods, and a tree-like stalk, commonly called three-thorned Acacia.

2. GLEDITSIA *spinis paucioribus, foliis pinnatis, siliquis ovalibus monospermis*. Gleditsia with a few spines, winged leaves, and oval pods, containing one seed.

These trees grow naturally in most parts of *North America*, where the first is known by the title of Honey Locust; this has been many years cultivated in the *English* gardens, and is known among the gardeners by the title of three-thorned Acacia. It rises with an erect trunk, to the height of thirty or forty feet, armed with long spines, which have two or three smaller coming out from the side; these are frequently produced in clusters at the knots, and are sometimes three or four inches long. The branches of this tree are also armed with the same sort of spines, and are garnished with winged leaves, composed of ten pair of small leaves, which sit close to the midrib, of a lucid green. The flowers come out from the side of the young branches in form of katkins; they are of an herbaceous colour, so make no figure. The hermaphrodite flowers are succeeded by pods near a foot and a half long, and two inches broad, divided into many cells by transverse partitions, each containing one smooth, hard, oblong seed, surrounded by a sweet pulp.

The second sort hath much the appearance of the first, but hath fewer spines, which are very short. The leaves are smaller, and the pods are oval, containing but one seed; this was discovered by the late Mr. *Catesby*, in *Carolina*, from whence he sent the seeds to *England*, by the title of Water Acacia, by which it is known in the gardens.

These trees are propagated by seeds; those of the first sort are annually sent to *England* in plenty, by the title of Locust, or Honey Locust, to distinguish it from the false Acacia, which is frequently called Locust Tree in *America*: the seeds may be sown upon a bed of light earth in the spring, burying them half an inch deep, and if the spring should prove dry, they must be frequently watered, otherwise the plants will not come up the first year, for I have sometimes had the seeds remain two years in the ground before

fore the plants have come up ; therefore those who are desirous to save time, should sow the seeds as soon as they arrive, and plunge the pots into a moderate hot-bed, observing to water them frequently ; by this method, most of the plants will come up the same season : they should be gradually inured to bear the open air, for if they are continued in the hot-bed, they will draw up weak. In autumn, the pots should be placed under a hot-bed frame, to protect them from frost, for these young plants generally keep growing late in the summer, so the upper part of their shoots is tender, and the early frosts of the autumn often kill the ends of them, if they are not protected, and this frequently occasions great part of the shoots decaying in winter ; for which reason those plants in the full ground, should be covered with mats in autumn, on the first appearance of frost, for a small frost in autumn will do more mischief to these young shoots which are full of sap, than severe frost when the shoots are hardened.

The following spring the plants may be transplanted into nursery-beds, at a foot distance, row from row, and six inches asunder in the rows, but this should not be performed till *April*, after the danger of hard frost is over ; for as the plants do not put out their leaves till very late, so there will be no hazard in removing them any time before *May*. If the season should prove dry, they must be watered, and if the surface of the beds is covered with moss, or mulch, to prevent the earth from drying, it will be of great service to the plants. In these beds the plants may remain two years, by which time, if the plants thrive well, they will be fit to transplant to the places where they are to remain, for they do not bear removing when large ; the best season for transplanting of these trees, is late in the spring ; they thrive best in a deep loamy soil, for in strong shallow ground they become mossy, and never grow large ; they should also have a sheltered situation, for when they are much exposed to winds, their branches are frequently broken in the summer season, when they are fully clothed with leaves.

GLOBULARIA. *Lin. Gen. Plant.* 106. Blue Daisy.

The Characters are,

It hath a flower composed of many florets, which are included in one common scaly empalement ; each floret is tubulous, and cut into four parts at the top. They have four stamina, terminated by distinct summits ; in the bottom of the tube is situated an oval germen, which afterward becomes an oval seed, sitting in the common empalement.

The Species are,

1. **GLOBULARIA** caule herbaceo, foliis radicalibus tridentatis, caulinis lanceolatis. *Flor. Suec.* 109. Common Globularia.
2. **GLOBULARIA** caule nudo, foliis integerrimis lanceolatis. *Lin. Sp. Plant.* 97. Pyrenean Globularia, with an oblong leaf and naked stalk.
3. **GLOBULARIA** caule fruticoso, foliis lanceolatis tridentatis integrisque. *Prod. Leyd.* 190. Globularia with a shrubby stalk, and spear-shaped leaves ending in three points.
4. **GLOBULARIA** foliis radicalibus crenato-aculeatis, caulinis integerrimis mucronatis. *Lin. Sp. Plant.* 96. Prickly Globularia.
5. **GLOBULARIA** caule subnudo, foliis cuneiformibus tricuspidatis, intermedio minimo. *Lin. Sp. Plant.* 96. Smallest Alpine Globularia, with a wild Marjoram leaf.
6. **GLOBULARIA** caule subnudo, capitulis alternis sessilibus, foliis lanceolato-ovatis integris. *Lin. Sp. Plant.* 97. Eastern Globularia with flowers scattered along the stalks.

The first of these plants grows plentifully about *Montpelier*, as also at the foot of the mountains *Jura* and *Saleva*, and in many other parts of *Italy* and *Germany*. It hath leaves very like those of the Daisy, but are thicker and smoother. The flowers grow on foot-stalks about six inches high,

and are of a globular form, composed of several florets, which are included in one common scaly empalement ; they are of a fine blue colour, and are succeeded by seeds, which sit in the empalement, and ripen in autumn.

The second sort grows plentifully in the woods, near the convent of the *Carthusians*, and on the *Pyrenean* mountains ; this is much larger than the former, and the foot-stalk is quite naked. The leaves are narrower, and much longer.

The first and second sorts may be propagated by parting of their roots after the manner of *Daisies*. The best season for this is in *September*, that they may take new root before the frosty weather comes on. They should be planted in a shady situation and a loamy soil, in which they will thrive much better than in light ground, and an open situation ; but the plants should not be removed oftener than every other year, if they are required to flower strong.

The third sort grows about *Montpelier* in *France*, and in *Valentia*, and several other parts of *Spain*. This has a hard woody stem, which rises about two feet high, dividing into many woody branches, beset with leaves like those of the *Myrtle* tree. On the top of the branches the flowers are produced, which are of a blue colour, and globe-shaped ; this plant is very difficult to propagate in *England*, where it does not produce seeds ; the cuttings, when carefully managed, will sometimes put out roots, but with great difficulty. In summer the plants may be exposed with other hardy exoticks, and in winter they should be placed under a hot-bed frame, where they may enjoy the free air in mild weather, but should be screened from hard frost, which will destroy them, if they are exposed thereto ; though in mild winters they will live in the open air.

The fourth sort was found in the mountains of *Granada*, by *Dr. Albinus* ; this plant is of low growth, and may be propagated as the first ; as may also the fifth sort, which is the least of all the kinds, and the most hardy, therefore should have a shady situation, and a cool moist soil.

The sixth sort was found by *Dr. Tournefort*, in the *Levant* ; this is tender, and should be sheltered from the frost in winter, under a frame, but in summer it should be exposed with other hardy exotick plants ; it will require to be frequently watered in dry weather, and is propagated by seeds, or by parting of the roots, as was directed for the former sorts.

GLORIOSA. *Lin. Gen. Plant.* 374. The Superb Lily.

The Characters are,

The flower hath no empalement ; it hath six spear shaped petals, which are waved, and reflexed to the bottom. It hath six stamina, which spread each way, terminated by prostrate summits. In the center is situated a globular germen, which afterward becomes an oval thin capsule with three cells, filled with globular seeds disposed in a double range.

The Species are,

1. **GLORIOSA** foliis longioribus capreolis terminalibus. Superb Lily, with longer leaves ending with clasps.
2. **GLORIOSA** foliis ovato-lanceolatis acutis. Superb Lily with oval, spear-shaped, acute leaves.

The first sort grows naturally on the coast of *Malabar*, and also in *Ceylon* ; this hath oblong fleshy roots of a whitish colour, and a nauseous bitter taste, from which arises a round weak stalk, which requires support to prevent its trailing on the ground. The stalks grow to the height of eight or ten feet, garnished with leaves placed alternate ; they are smooth, about eight inches long, and one and a half broad at the base, growing narrower till within two inches of the end, which runs out in a narrow point, ending with a tendril or clasper, by which it fastens to the neighbouring plants for support. At the upper part of the stalk the flowers are produced, standing upon slender foot-stalks ; they are composed of six oblong petals, ending with acute points, which, on their first opening, are of a yellowish

lowish herbaceous colour, standing at first erect, but when fully opened, hang downward as the Crown Imperial and Fritillary; the petals turn quite back, and change to a very beautiful red flame colour, their acute points meeting at the foot-stalk; these petals are finely waved on their edges. The six stamina spread out every way almost horizontal, and are terminated by prostrate summits. In the center of the flower is situated a roundish germen, supporting an inclining style, crowned by a triple stigma. It flowers in July, and often perfects seeds in this country. The stalks decay in autumn, and the roots remain inactive all the winter. The roots, and every part of this plant, is very poisonous, so should not be put in the way of children.

The seeds of the second sort were sent me by Monf. Richard, gardener to the French king at Trianon; which were brought from Senegal by Monf. Adanson, who discovered this plant growing there naturally; this is said to have a blue flower, but the plants which are in the Chelsea garden have not yet flowered. This hath a climbing stalk, which is garnished with smooth leaves about two inches long and two broad, ending in acute points, with short tendrils or clasps. The stalks as yet have not grown more than four feet high here. The leaves have a strong disagreeable scent on being handled, so as to be troublesome to the head if too near, or long smelt to.

These plants are propagated by their roots; those of the first sort creep and multiply pretty fast. These roots may be taken out of the ground when their stalks are decayed, and preserved in sand during the winter season, but they must be kept in the stove, or a warm room, where they can receive no injury from the cold, and in the spring they must be planted in pots filled with light earth, and plunged into the tan-bed in the stove; but others chuse to let the roots continue in the ground all the winter, keeping the pots always in the tan-bed; where this is practised, the roots should have very little water in the winter, for as they are then in an inactive state, so moisture at that time frequently rots them.

Toward the latter end of March, or the beginning of April, their stalks will appear, when there should be some tall sticks put down by them to support them, otherwise they will trail over the neighbouring plants, and fasten to them by the tendrils, which are at the ends of the leaves. The stalks will rise ten or twelve feet high, if the roots are strong; some of them will produce two or three flowers, which come out from the wings of the stalk near the top; these flowers make a fine appearance in the stove during their continuance, which is seldom more than ten days or a fortnight. In the summer, when the plants are growing, they will require frequently to be watered, but they must not have it in too large quantities. Those roots which are not taken out of the pots in winter, should be transplanted and parted the beginning of March, before they put out new fibres or stalks, for they must not be removed when they are in a growing state; the pots in which these roots are planted, should not be too large, for unless they are confined, they will not put out strong stalks; the largest roots may be planted in twopenny pots, but the small ones will require only pots of about five or six inches over at the top.

GLYCINE. *Lin. Gen. Plant.* 797. Knobbed-rooted Liquorice Vetch.

The Characters are,

The flower is of the butterfly kind. The standard is deflexed on the sides, and indented at the point. The wings bend backward. The keel is sickle-shaped, turning upward with its point to the standard. The empalement hath two lips. It hath ten stamina, nine of which are joined in one body, and the other stands single. In the center is situated an oblong germen, which

afterward becomes an oblong pod with two cells, inclosing kidney-shaped seeds.

The Species are,

1. GLYCINE *foliis pinnatis ovato-lanceolatis.* Hort. Upsal. 227. Glycine with oval, spear-shaped, winged leaves. This is the *Apios Americana.* Cornut. 200.

2. GLYCINE *foliis pinnatis caule perenni.* Hort Cliff. 361. Glycine with winged leaves and a perennial stalk.

3. GLYCINE *foliis pinnatis conjugatis, pinnis ovatis oblongis obtusis.* Flor. Zeyl. 284. This is commonly called wild Liquorice in the West-Indies.

4. GLYCINE *foliis ternatis hirsutis, racemis lateralibus.* Lin. Sp. Plant. 754. Glycine with hairy trifoliate leaves, and flowers growing in long bunches from the sides of the stalks.

5. GLYCINE *foliis ternatis tomentosis, racemis axillaribus brevissimis, leguminibus dispermis.* Lin. Sp. Plant. 754. Glycine with woolly trifoliate leaves, and very short spikes of flowers proceeding from the sides of the stalks, with pods containing two seeds.

The first sort grows naturally in Virginia; it hath roots composed of several knobs, or tubers, which hang to each other by small strings; from these come out in the spring slender twining stalks, which rise to the height of eight or ten feet, garnished with winged leaves, composed of three pair of oval spear-shaped lobes, terminated by an odd one. The flowers come out in short spikes from the side of the stalks; they are of a Pea blossom kind, of a dirty fresh colour, having little scent. The stalks decay in autumn, but the roots continue; this is propagated by parting of the roots, each of the tubers being separated from the principal root, will grow; the best time for this is about the end of March, or the beginning of April, before they put out shoots. The roots should be planted in a warm situation, and in hard frost covered to protect them, otherwise they will not live abroad in this country; where they have been planted against a south wall, they have thriven and flowered extremely well, which they seldom do in any other situation; and those roots which are planted in pots rarely flower, nor do their stalks rise near so high as those which are planted in the full ground; some ignorant persons call this the Twickenham Climber.

The second sort was brought from Carolina, but has been since observed in Virginia, and some other parts of North America; this has woody stalks, which twist themselves together, and also twine round any trees that grow near, and will rise to the height of fifteen feet, or more. The leaves are winged, and in shape somewhat like the Ash tree, but have a greater number of pinnæ. The flowers are produced from the wings of the leaves, which are of a purple colour; and are succeeded by long cylindrical pods, shaped like those of the scarlet Kidney Bean, containing several kidney-shaped seeds, but these are never perfect in England.

This climbing shrub is raised for sale in several nurseries near London, where it is known by the name of Carolina Kidney Bean tree. It is propagated by laying down the young branches in October, which will be rooted by that time twelvemonth, and may then be transplanted either in a nursery for a year to get strength, or to the place where they are to remain for good, which should be in a warm light soil and a sheltered situation, where they will endure the cold of our ordinary winters very well; and if their roots are covered with Straw, Fern, Pease haulm, or any other light covering, there will be no danger of their being destroyed by great frost.

The third sort grows naturally in both Indies, and also in Egypt. This a perennial plant, with slender twining stalks, which twist round any neighbouring support, and rise to

the height of eight or ten feet, garnished with winged leaves, composed of sixteen pair of oblong blunt lobes, set close together, which have the taste of Liquorice, from whence the inhabitants of the *West-Indies* have given it the name of Wild Liquorice, and use the herb for the same purpose as Liquorice is used in *Europe*. The flowers are produced from the side of the stalks in short spikes or bunches; they are of a pale purple colour, and shaped like those of the Kidney Bean; these are succeeded by short pods, each containing three or four hard round seeds of a scarlet colour, with a black spot or eye on the side, which is fastened to the pod. The seeds are frequently brought to *England* from the *West-Indies*, and are wrought into various forms, with shells and other hard seeds.

It is propagated by seeds, which must be sown upon a good hot-bed in the spring; but as they are very hard, so unless they are soaked in water a day or two before they are sown, they frequently lie in the ground a whole year before they vegetate; but when soaked, the plants will appear in three weeks after the seeds are sown, if they are good, and the bed in a proper temperature of heat. When the plants are two inches high, they should be each transplanted into a separate pot, and plunged into a hot-bed of tanners bark, where they should be shaded from the sun till they have taken new root; after which they must be treated in the same manner as other tender plants from the same countries, always keeping them in the bark-stove, for they are too tender to thrive in any other situation in *England*.

There are two other varieties of this plant, one with a white, and the other a yellow seed, but the plants do not differ from the other in leaf or stalk; but as these have not as yet flowered in *England*, so I do not know how their flowers may differ.

The fourth sort hath a perennial root and an annual stalk. This rises from two to three feet high, with slender herbaceous stalks, garnished with trifoliate hairy leaves, sitting close to them; the small leaves or lobes, are of the oval spear-shape, ending in acute points. The flowers come out from the side of the stalks, upon foot-stalks about two inches long; the spike of flowers is about the same length, and is recurved; they are of the Pea blossom kind, sitting close together, but small, and of a fine blue colour.

This sort grows naturally in *North America*, and is hardy enough to live in the open air in *England*. It may be propagated by seeds, or parting of the roots; the former is the best method, where good seeds can be obtained; these should be sown on a bed of light earth in the spring, and if the season should prove dry, they must be frequently refreshed with water, otherwise they will remain a long time in the ground before they vegetate; in the autumn, when their stalks are decayed, if some rotten tanners bark is spread over the surface of the ground, it will protect the roots from being injured by the frost. In the spring, the roots should be transplanted to the places where they are designed to remain, which must be in a warm sheltered situation and a light soil, where they will thrive and produce flowers annually. If this is propagated by parting of the roots, it should be done in the spring, before the roots begin to shoot, which is the best season for transplanting of the plants.

The fifth sort is a perennial plant with a climbing stalk, which rises six or seven feet high, garnished with woolly trifoliate leaves: the flowers come out in short bunches from the side of the stalks, they are small, of a yellow colour, and are succeeded by short pods, which contain two roundish seeds in each. It grows naturally in *Virginia*, and also in *India*. This is propagated by seeds, but the plants require protection in winter.

GLYCYRRHIZA. *Lin. Gen. Plant.* 788. Liquorice.

The Characters are,

The flower hath a permanent empalement of one leaf, divided into two lips. The flower is of the butterfly kind, having a long erect standard, with oblong wings, and a two-leaved keel which is acute. It hath ten stamina, nine joined and one standing single. In the bottom is situated a short germen, which afterwards becomes an oblong, or oval compressed pod with one cell, including two or three kidney-shaped seeds.

The Species are,

1. GLYCYRRHIZA *leguminibus glabris.* Hort. Cliff. 490. Liquorice with smooth pods. This is the common Liquorice.

2. GLYCYRRHIZA *leguminibus echinatis.* Prod. Leyd. 386. Liquorice with prickly pods.

3. GLYCYRRHIZA *leguminibus hirsutis.* Prod. Leyd. 386. Eastern Liquorice with hairy pods.

The first sort is that which is commonly cultivated in *England* for medicine; the other two kinds are preserved in curious botanick gardens for variety, but their roots are not so full of juice as the first, nor is the juice so sweet, though the second sort seems to be that which *Dioscorides* has described and recommended; but I suppose, the goodness of the first has occasioned its being so generally cultivated in *England*.

The roots of this run very deep into the ground, and creep to a considerable distance, especially where they are permitted to stand long unremoved; from these arise strong herbaceous stalks, four or five feet high, garnished with winged leaves, composed of four or five pair of oval lobes, terminated by an odd one; the flowers come out in spikes from the upper part of the stalks, standing erect; they are of a pale blue colour, and are succeeded by short compressed pods, each containing two or three kidney-shaped seeds, which rarely ripen in *England*.

This plant delights in a light sandy soil, which should be three feet deep at least, for the goodness of Liquorice consists in the length of the roots: the greatest quantity of Liquorice which is propagated in *England*, is about *Pontefract* in *Yorkshire*, and *Godalmin* in *Surry*; though of late years, there hath been great quantities cultivated in the gardens near *London*: the ground intended for Liquorice, should be well dug and dunged the year before, that the dung may be perfectly rotted, and mixed with the earth, otherwise it will be apt to stop the roots from running down; and before it is planted, the ground should be dug three spades deep with two shovels; when it is thus well prepared, a sufficient quantity of fresh plants taken from the sides or heads of the old roots should be provided, each of them should have a good bud or eye, otherwise they are subject to miscarry; these plants should be about eight or ten inches long, and perfectly sound.

The best season for planting them is toward the end of *February*, or the beginning of *March*, which must be done in the following manner; viz. First strain a line cross the ground, beginning at one end of the piece, then with a long dibble made on purpose, put in the shoot, so that the whole plant may be set straight into the ground, with the head about an inch under the surface in a straight line, about a foot asunder, or more, in rows, and two feet distance row from row; and after having finished the whole spot of ground, it may be sown with a thin crop of Onions, which do not root deep into the ground, nor spread much above, so will do the Liquorice no damage the first year; for the Liquorice will not shoot very high the first season, and the hoeing of the Onions will also keep the ground clear from weeds; but in doing this, care should be taken not to cut off the shoots of the Liquorice plants, as they appear above ground, which would greatly injure them, and to cut up all the Onions which grow near the heads of the Liquorice; after the Onions are

are full grown and pulled up, the ground should be cleared from weeds; and in *October*, when the shoots of the Liquorice are decayed, a small quantity of very rotten dung spread upon the surface of the ground, will prevent the weeds from growing during the winter, and the rain will wash the dung into the ground, which will greatly improve the plants.

In the beginning of *March* following, the ground between the rows of Liquorice should be slightly dug, burying the remaining part of the dung; but in doing this, care must be taken not to cut the roots. This stirring the ground will not only preserve it clean from weeds a long time, but also greatly strengthen the plants.

The distance I have allowed for planting these plants, will, I doubt not, by some, be thought too great; but, in answer to that, I would only observe, that as the largeness of the roots is the chief advantage to the planter, the only method to obtain it, is by giving them room; besides, this will give a greater liberty to stir and dress the ground, which is of great service to Liquorice; and if the plantation designed were to be of an extraordinary bigness, I would advise the rows to be made at least three feet distant, whereby it will be easy to stir the ground with a hoeing plough, which will greatly lessen the expence of labour.

These plants should remain three years from the time of planting, when they will be fit to take up for use; which should not be done until the stalks are perfectly decayed, for when it is taken up too soon, it is subject to shrink greatly, and lose of its weight.

The ground near *London* being rich, increases the bulk of the root very fast; but when it is taken up, it appears of a very dark colour, and not near so light as that which grows upon a sandy soil in an open country.

The second sort grows naturally in some parts of *Italy*, and the *Levant*; the stalks and leaves of this are very like those of the first, but the flowers are produced in shorter spikes, and the pods which succeed them are very short, broad at their base, ending in acute points, and are armed with sharp prickles. This flowers about the same time as the first, and in warm seasons will perfect seeds in *England*.

The third sort grows naturally in the *Levant*. This hath much the appearance of the other two species, but the pods of it are hairy, and longer than those of the other. Both these sorts may be propagated in the same manner as the first, or from seeds, which may be sown in the spring on a bed of light earth; but as neither of these are used, so they are seldom propagated, unless for the sake of variety.

GNAPHALIUM. *Lin. Gen. Plant.* 850. Goldylocks, or Eternal Flower.

The Characters are,

It hath a compound flower, made up of hermaphrodite florets and female half florets, included in one shining scaly empalement; the hermaphrodite florets are tubulous, and cut into five parts at the brim; these have five short hairy stamina. In the center is situated a crowned germen, which afterward becomes a single seed, which in some species is crowned with a hairy down, and in others a feathery down. The female florets have no stamina, but a crowned germen supporting a slender style. These are in some species fruitful, and in others they are barren.

The Species are,

1. **GNAPHALIUM tomentosum**, foliis caulinis linearibus, caule fruticoso, corymbo composito. Cassidony, or narrow-leaved Goldylocks.

2. **GNAPHALIUM foliis linearibus**, caule fruticoso ramoso, corymbo composito. *Hort. Cliff.* 401. Goldylocks with a branching shrubby stalk, very narrow leaves, and a compound corymbus of flowers.

3. **GNAPHALIUM foliis alternis**, acutè dentatis, subtus villosis, pedunculis longissimis unifloris. Goldylocks with alternate

leaves sharply indented, hairy on their under side, with very long foot-stalks sustaining one flower.

4. **GNAPHALIUM foliis semiamplexicaulibus ensiformibus**, repandis obtusis, utrinque pubescentibus, floribus conglomeratis. *Prod. Leyd.* 149. Broad-leaved wild Goldylocks, with heads growing in clusters.

5. **GNAPHALIUM caule ramoso diffuso**, floribus confertis terminalibus. *Flor. Lapp.* 300. Goldylocks with a diffused branching stalk, and flowers in clusters at the top.

6. **GNAPHALIUM caule simplicissimo**, floribus sparsis. *Flor. Lapp.* 298. Goldylocks with a single stalk, and flowers growing scatteringly.

7. **GNAPHALIUM caule simplicissimo corymbo simplici terminali**, sarmentis procumbentibus. *Hort. Cliff.* 400. Goldylocks with a single stalk terminated by a single corymbus, and trailing branches.

8. **GNAPHALIUM foliis confertis angusto-lanceolatis**, caule fruticoso, corymbo composito. *Hort. Cliff.* 402. Eastern Goldylocks, called Immortal Flower.

9. **GNAPHALIUM foliis linearilanceolatis obtusis**, utrinque tomentosis, corymbo composito terminali. German Goldylocks, with a reddish gold-coloured empalement.

10. **GNAPHALIUM foliis linearilanceolatis acuminatis**, alternis, caule supernè ramoso corymbis fastigiatis. *Hort. Cliff.* 401. Broad leaved *American* Goldylocks.

11. **GNAPHALIUM foliis amplexicaulibus**, ovatis, nervosis, utrinque lanuginosis. *Lin. Sp. Plant.* 850. Goldylocks with oval nervous leaves embracing the stalks, which are downy on both sides.

12. **GNAPHALIUM foliis amplexicaulibus integerrimis acutis**, subtus tomentosis, caule ramoso. *Hort. Cliff.* 402. Most stinking *African* Goldylocks, with a very large leaf, and a silvery empalement to the flower.

13. **GNAPHALIUM foliis decurrentibus acutis**, undatis, subtus tomentosis, caule ramoso. *Hort. Cliff.* 402. Stinking Goldylocks, with an acute leaf and winged stalk.

14. **GNAPHALIUM foliis lanceolatis semiamplexicaulibus**, caule infernè ramoso terminali. *Hort. Cliff.* 401. Goldylocks with spear-shaped leaves embracing the stalks, whose under branches are terminated with flowers.

15. **GNAPHALIUM foliis linearilanceolatis**, caule infernè ramoso, corymbo composito terminali. *Hort. Cliff.* 401. Goldylocks with narrow spear-shaped leaves, the under part of the stalk branching, and a compound corymbus terminating the branches.

16. **GNAPHALIUM foliis linearibus tomentosis**, integerrimis sessilibus, corymbis alternis conglobatis, floribus globosis. *Prod. Leyd.* 149. Goldylocks with a soft red flower.

17. **GNAPHALIUM fruticosum**, foliis infernè lanceolatis caulibus linearilanceolatis, utrinque tomentosis, corymbo composito terminali. Shrubby *African* Goldylocks, with longer and narrower leaves, which are hoary.

18. **GNAPHALIUM foliis decurrentibus obtusis infernè villosis**, corymbis conglobatis terminalibus. Goldylocks with obtuse running leaves, hoary on their under side, and a clustered corymbus of flowers terminating the stalk.

The first sort hath a shrubby stalk about three feet high, dividing into many slender branches garnished with obtuse leaves; those upon the flower-stalks are very narrow, ending in acute points; the whole plant is very woolly, the flowers terminate the stalks in a compound corymbus; their empalements are of a silvery colour at first, and very neat, but afterward turn of a yellowish sulphur colour. If these are gathered before the flowers are much open, the heads will continue in beauty many years, especially if they are kept from the air and dust. This is generally supposed to be the true golden Cassidony of the shops, but the second sort is usually substituted for it in *England*.

It is propagated by slips or cuttings, which may be planted in *June or July*, in a bed of light earth, and covered with glasses, or shaded with mats, they will put out roots in five or six weeks; when they are well rooted, they should be taken up and planted in pots, and placed in a shady situation till they have taken new root; then they may be removed to an open situation, and placed among other hardy exoticks, till about the middle or end of *October*; at which time they should be placed under a common frame, where they may be protected from frost, but in mild weather they should be exposed to the open air. With this management, in winter, the plants will be much stronger than those which are kept in the green house, where they generally draw too weak; for they are so hardy, as in very mild winters to live abroad in warm borders near walls, with little shelter.

The second sort hath a shrubby stalk, which divides into many slender branches, covered with a white bark; these form a bushy under shrub, near three feet high, garnished with very narrow leaves, hoary on their under side, but green on their upper, placed without order on every side the stalks; the flowers are produced in a compound corymbus at the end of the branches; their heads are small, and are of a yellow colour when fully blown. This grows naturally in *France and Germany*, and is hardy enough to live in the open air in *England*. It is propagated by slips or cuttings, in the same way as the former, and in the autumn they may be transplanted into the place where they are designed to remain.

The third sort is an annual plant, which grows naturally in *Italy and Sicily*; this hath an herbaceous stalk, little more than a foot high, garnished with acute indented leaves, which are hoary on their under side; the flowers stand upon long foot-stalks, which rise far above the branches, each sustaining one small whitish flower. It is propagated by seeds, which should be sown upon a bed of light earth where the plants are designed to remain; and when the plants come up, they should be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The fourth sort is an annual plant, with woolly stalks about eight inches high, garnished with oblong leaves, which embrace them with their base; the flowers grow in close clusters, at the top and from the side of their stalks, which are included in dry silvery empalements.

There is another species of this with narrower leaves, not quite so woolly; the stalks rise higher, and are more branched; the flowers grow in close bunches on the top of the stalks, and are of a pale yellow colour.

Both these sorts will come up better from the scattered seeds, than when they are sown by art; but if the seeds are sown, it must be soon after they are ripe, otherwise they will not succeed. The plants require no other care, but to be kept clean from weeds, and thinned where they are too close.

The fifth sort is an annual plant, which grows naturally in many parts of *England*, on places which are covered with water in the winter; this is a low branching plant with silvery leaves and dark heads of flowers, but being of no use is not cultivated in gardens.

The sixth sort is also an annual plant with narrow leaves, which are hoary on their under side; the stalks grow erect about a foot high, and at every joint is produced a short spike of white flowers. This is found growing naturally in some parts of *England*, so is not often admitted into gardens. If the seeds of this sort are permitted to scatter, the plants will come up in the spring with greater certainty than if sown, and they will require no culture.

The seventh sort grows naturally in the northern parts of *England*, upon the tops of hills and mountains, where the shoots which are sent out from every side of the plant put out roots, whereby it is propagated in great plenty: the leaves of this grow close to the ground, they are narrow at their base, but rounded at the end where they are broad; they are not an inch long, and hoary on their under side; the stalks are single, and rise about four inches high, terminated by a corymbus of flowers which is single.

There are two varieties of this, one with a purple and the other a variegated flower, and continue their difference in the gardens. They are easily propagated by offsets, which should be planted in the autumn, in a shady situation, where they will require no other care but to keep them clean from weeds. This plant is called *Pes Cati*, or Catsfoot.

The eighth sort is supposed to have been brought first from *India to Portugal*, where it has been long propagated for the beauty of its golden heads of flowers, which, if gathered before they are too open, will continue in beauty several years; so that in the winter season, they ornament their churches with these flowers, and many of them are annually brought to *England*, and sold for ornaments to the ladies. These plants have a short shrubby stalk, seldom rising more than three or four inches high, putting out many short branches; the leaves are narrow and woolly on both sides, and come out without order; the flower-stalks grow eight or ten inches high, garnished all the way with narrow hoary leaves, terminated by a compound corymbus of bright yellow flowers, with large heads. This is propagated by slipping off the branches during any of the summer months, and after stripping off the lower leaves, planted in a bed of light earth, covering them with hand glasses, which must be shaded every day when the sun is warm; when these are rooted, they should be planted in pots, and treated in the same manner as hath been directed for the first sort. These plants in mild winters will live abroad in a very warm border with very little shelter, and the hardier they are treated, the greater number of flowers they will produce; for when they are grown weak in a green-house, they never flower so strong.

The ninth sort hath very woolly stalks and leaves, which are much longer than those of the eighth; the stalks rise a foot high, sending out a few side branches, terminated by a compound corymbus of flowers, whose heads are small, and of a gold colour, changing a little red as they fade. This is propagated by slips in the same manner as the last mentioned, but the plants will live in the open air, if they are planted on a dry soil.

The tenth sort grows naturally in *North America*, but has been long in the *English* gardens. This hath a creeping root, which spreads far in the ground, so as to become a troublesome weed very often, unless it is kept within bounds; the stalks of this are woolly, rising a foot and a half high, garnished with long, narrow, woolly leaves, ending in acute points, placed alternate; the upper part of the stalk branches into two or three divisions, each being terminated by a close corymbus of flowers, with pretty large silvery empalements, which, if gathered and properly dried, will retain their beauty several years. This sort will thrive in almost any soil or situation, and is easily propagated by its creeping roots.

The eleventh sort grows naturally at the *Cape of Good Hope*. It is an annual plant, which sends out many oblong blunt leaves near the root; the stalks rise a foot and a half high, garnished with leaves placed alternate, which are broad at their base, where they embrace the stalks, but end in acute points; they are woolly, and, when handled,

emit

emit a very rank odour; the stalks are terminated by a corymbus of flowers, in large silvery empalements, which will retain their beauty several years.

The twelfth sort grows naturally at the *Cape of Good Hope*, and is an annual plant, very like the former sort, but the leaves are of a yellowish green on the upper side, and woolly on the under; the stalks, branch, and the heads of flowers, are of a bright yellow colour, and these differences are permanent.

Both these plants are propagated by seeds, which, if sown in the autumn on a warm border, will more certainly succeed, than when they are sown in the spring; or if the seeds are permitted to scatter, the plants will come up without care, and may be transplanted while they are young, to the places where they are designed to remain; when the plants have taken root, they will require no other care, but to keep them clean from weeds. They flower in *July*, and the seeds ripen in autumn.

The thirteenth sort grows in *Africa*, and also in *North America*, from both these countries I have received the seeds. It is an annual plant, with oblong leaves at the bottom, which are a little waved, and hoary on their under side. The stalks rise about a foot high, garnished with acute pointed leaves; from their base runs a border or wing along the stalk; the whole plant has a disagreeable odour. The flowers grow in a corymbus on the top of the stalks, they are white, and appear in *July*. The seeds ripen in the autumn, which, if permitted to scatter, the plants will come up without care, as the two former sorts.

The fourteenth sort rises with a shrubby stalk three or four feet high, sending out many branches at bottom, garnished with narrow spear-shaped leaves, which half embrace the stalks with their base; they are of a dark green on their upper side, but hoary on their under; the stalks are terminated by a compound corymbus of yellow flowers, whose heads are small: these continue in succession great part of the summer, but are rarely succeeded by seeds in *England*. It is easily propagated by cuttings in any of the summer months, which may be planted in a shady border. These will take root in a month or five weeks, and may then be taken up and planted in pots, placing them in a shady situation till they have taken fresh root; then they may be removed to a sheltered situation, and placed with other hardy green-house plants till autumn, when they must be carried into the green-house, where, during the winter season, they should have as much free air as possible in mild weather, for they only require protection from frost, so they should be treated in the same manner as other hardy green-house plants.

The fifteenth sort grows naturally at the *Cape of Good Hope*; this rises with a slender shrubby stalk, which sends out many lateral branches, garnished with very narrow leaves, which are hoary on their under side. The flowers are produced in a compound corymbus at the end of the branches; they are at their first appearance of a pale red colour, but afterward change to a gold colour; the empalements of this sort are small, and dry like other species of this genus. This sort is propagated by cuttings, in the same manner as the former, and the plants require the same treatment.

The sixteenth sort grows naturally in *Isria*. This is a perennial plant, whose under leaves spread on the ground, which are obtuse, and woolly on their under side; the stalks rise about six inches high; the leaves upon these are narrow, ending in acute points; at each of the joints on the upper part of the stalks, is produced a compact corymbus of flowers, which are placed alternate on each side, the stalk is terminated by a larger corymbus sitting very close; these are of a fine soft red colour, so make a pretty appearance in the month of *June*, when they are in beauty.

This sort is propagated by offsets from the roots, in the same manner as the seventh sort, but this doth not produce them in plenty, so is very uncommon in the *English* gardens at present: it requires a drier soil than the seventh, and a warmer situation, but not too much exposed to the mid-day sun, so should be planted to an east aspect, for it is rarely injured by the cold in *England*.

The seventeenth sort grows naturally at the *Cape of Good Hope*, but has been long preserved in many curious gardens in *Europe*. Dr. *Linnaeus* supposes this and the eighth to be but one species, which he might easily be inclined to do, by seeing the dried specimens only; for these seem only to differ in colour of their flowers or heads, which he never admits as a specific difference. But those who have observed the growing plants, cannot doubt of their being two distinct species; for the stalks of this rise three or four feet high, sending out several long irregular branches, which are terminated by a compound corymbus of flowers; whereas the eighth sort never rises with a stalk, but the branches sit close to the ground, and never divide: the branches of this sort are garnished with leaves, which are much longer than those of the other, and the heads of the flowers are of a bright silver colour. This is propagated by cuttings, which should be planted in the same manner as hath been directed for the eighth sort, and the plants should also be treated the same way.

The eighteenth sort was raised from seeds in the *Chelsea* garden, which came from the *Cape of Good Hope*. The lower leaves of this are oblong and blunt; the stalks are shrubby, and divide into many irregular branches, which rise about three feet high, garnished with oblong blunt-pointed leaves, hoary on their under side, but of a dark green above; from the base of the leaves runs a border along the stalk, like a wing of the same consistence with the leaves, which Dr. *Linnaeus* calls a running leaf. The stalks are terminated by a compound corymbus of flowers, which are very closely joined together, of a bright gold colour, but the flowers are small, and change to a darker colour as they fade; there is a succession of these flowers most part of the summer, and the early flowers are frequently succeeded by seeds in *England*. This sort may be propagated by slips or cuttings, in the same manner as the former, and the plants may be treated accordingly.

GNAPHALODES. See *Micropus*.

GOMPHRENA. *Lin. Gen. Plant.* 279.

The Characters are,

The flower hath a large coloured empalement, which is permanent. The petal is erect, and cut into five parts at the brim, which spread open; it hath five stamina, scarcely discernable, situated in the brim of the nectarium. In the center is situated an oval-pointed germen, which germen afterward becomes one large roundish seed, inclosed in a thin crusted capsule with one cell.

The Species are,

1. GOMPHRENA caule erecto, foliis ovato-lanceolatis capitulis solitariis, pedunculis diphyllis. *Hort. Cliff.* 86. Globe Amaranthus with large purple heads.
2. GOMPHRENA caule erecto spicâ interruptâ. *Prod. Leyd.* 419. Gomphrena with an erect stalk, and an interrupted spike of flowers.
3. GOMPHRENA foliis lanceolatis, capitulis diphyllis, flosculis perianthio proprio distinctis. *Lin. Sp. Plant.* 224. Perennial Globe Amaranthus, with radiated Straw-coloured flowers.
4. GOMPHRENA foliis carnosis obtusis, capitulis oblongis terminalibus. *Lin. Sp. Plant.* 224. Low Globe Amaranthus of *Curasso*, with shining Onion leaves and white heads.
5. GOMPHRENA caule repente, capitulis rotundis sessilibus, foliis lanceolato-ovatis. *Lin. Sp. Plant.* 225. Gomphrena with a creeping stalk, round heads sitting close to the stalks, and oval spear-shaped leaves.

6. GOMPHRENA

6. *GOMPHRENA caule procumbente, foliis inferioribus lanceolatis, superioribus rotundatis capitulis laxis terminalibus.* Globe Amaranthus with a Campion leaf, and smaller purple heads.

7. *GOMPHRENA pedunculis oppositis bifidis tricapitalis capitulo intermedio sessili.* Lin. Sp. Plant. 224. Climbing Globe Amaranthus with a Campion leaf, and yellowish heads of flowers.

The first sort grows naturally in *India*, but it has been many years cultivated in all the curious gardens in *Europe*; it is an annual plant, which rises with an upright branching stalk about two feet high, garnished with spear-shaped leaves, placed opposite. The branches also come out opposite; the foot-stalks of the flowers, which are long and naked, have two short leaves, close under each head of flowers. The heads, at their first appearance are globular, but as they increase in size, become oval; these are composed of dry scaly leaves, placed imbricatum, like the scales of fish; under each of these is situated a tubulous flower, which just peeps out of the covering, but are not much regarded by the generality of people, for it is the scaly empalement which covers them that is so beautiful as to attract the eye, and these, if gathered before they are too much faded, will retain their beauty several years. After the flowers are past, the germen, which is situated in the bottom of each, becomes a large oval seed, inclosed in a chaffy covering, which ripens late in autumn, and the plant decays soon after.

There are two varieties of this sort, one with fine bright purple heads, the other hath white or silvery heads, which never alter, so that they are permanent varieties, though, in other respects they do not differ; there is also one with mixed colours, but whether this arose accidentally from the seeds of either of the former, I cannot determine, for this variety continues from seeds, and the other two I have cultivated more than thirty years, and have never found either of them vary.

The second sort hath much slenderer stalks than the first, it grows taller. The leaves are smaller, but of the same shape. The flowers grow in spikes at the end of the branches, which are broken, or divided into three or four parts, with spaces between them. They are small and of a pale purple colour.

The third sort hath slender upright stalks, garnished with hairy spear-shaped leaves placed opposite, which sit close to the stalks; these are terminated by small heads of flowers, which spread open from each other, so as that their empalements appear distinct; they are of a pale Straw-colour, so make no great appearance. The seeds, sometimes, will ripen in *England*, but the plants will live two or three years, if they are preserved in a stove.

The fourth sort hath creeping stalks, which put out roots at their joints, as they trail upon the ground; which are garnished with narrow, fleshy, succulent leaves, of a lucid green. The flowers are produced on foot-stalks, which grow at the end and side of the stalks; they are collected in small, oblong, silvery heads, which have dry empalements like the other sorts. This grows naturally in most of the islands of the *West-Indies*.

The fifth sort hath creeping stalks, which put out roots at the joints as they trail on the ground, garnished with small, spear-shaped, oval leaves, placed opposite. The flowers are produced at the joints in round silvery heads, sitting close to the stalks, and are succeeded by a single oval seed, wrapped up in a down. It grows naturally in all the *West-Indies*.

The sixth sort hath trailing stalks, which are garnished with small, spear-shaped leaves at the bottom, but at the top they are hairy. The leaves of this are hairy. The

flowers terminate the stalks in small round purple heads, which are loose; these are succeeded by single seeds, wrapped up in a down.

The seventh sort hath climbing stalks, which rise upward of twenty feet, where they meet with support, garnished with leaves like Campion, placed opposite. The flowers are produced upon long foot-stalks, which come out opposite; these branch out into smaller foot-stalks, each sustaining three heads of yellow flowers, the middle one sitting close to the stalk.

The two sorts which are first mentioned, one with a purple, and the other with silver-coloured heads, are very ornamental plants in gardens, and are now very commonly cultivated in the *English* gardens as choice annuals. In *Portugal*, and other warm countries, they are cultivated to adorn their churches in the winter, for if these are gathered when they are in perfection, and dried in the shade, they will retain their beauty a long time, especially if they are not too much exposed to the air: these plants are propagated by seeds, which should be sown in a good hot-bed the beginning of *March*; but if the seeds are not taken out of their chaffy covering, it will be proper to soak them in water for twelve hours before they are sown, which will greatly facilitate their growing. When the plants are come up half an inch high, they should be transplanted on a fresh hot-bed, at about three inches distance, observing to shade them till they have taken root; then they should have fresh air admitted to them every day, in proportion to the warmth of the season. In about a month or five weeks the plants will have grown so large, as to nearly meet, so they will require more room, otherwise they will draw up weak; then a fresh hot-bed should be prepared, into which there should be a sufficient number of three farthing pots plunged, filled with light rich earth, and when the bed is in a proper temperature of warmth, the plants should be carefully taken up with balls of earth to their roots, and each planted into a separate pot, observing to shade them till they have taken new root, and afterward they must be treated in the same manner as other tender exotic plants. When the plants have filled these pots with their roots, they should be shaken out of them, and their roots on the outside of the ball of earth must be carefully pared off; then they should be put into larger pots, and where there is conveniency of a deep frame, to plunge the pots into another gentle hot-bed, it will bring the plants early to flower, and cause them to grow much larger than those which are placed abroad. In *July* the plants should be inured gradually to bear the open air, into which some of them may be removed about the middle of that month, and intermixed with other annual plants to adorn the pleasure-garden, but it will be proper to keep a plant or two of each sort in shelter for seeds, because when the autumn proves cold or wet, those plants which are exposed abroad, seldom produce good seeds.

The other sorts are all of them tender plants, so require to be raised on a hot-bed, and the plants afterward treated in the same manner as hath been directed for the former sorts; and if the trailing sorts are turned out of the pots, when the roots have filled them, and planted upon a hot-bed, their stalks will put out roots at their joints, and their branching stalks will extend to a considerable distance on every side, and will produce their heads of flowers at every joint; but unless the glasses are kept over them, and only a proper share of air admitted to them, they will not perfect seeds in *England*.

The perennial climbing sort must be removed into the bark-stove, and plunged into the back side of the tan-bed, where it may have room to grow in height; the plants will live three or four years, if they are preserved in a stove.

These sorts are not very ornamental, so they are seldom cultivated but in botanick gardens for the sake of variety.

GOOSEBERRY. See *Grossularia*.

GORZ. See *Ulex*.

GOSSYPIUM. *Lin. Gen. Plant*, 755. Cotton.

The Characters are,

The flower has a double empalement. It hath five plain heart-shaped petals, which join at their base, and a great number of stamina, which are joined at bottom in a column, and are inserted into the petals. It hath a round germen, supporting four styles, joined in the column. The germen afterward becomes a roundish capsule, ending in a point, having four cells, which are filled with oval seeds, wrapped up in down.

The Species are,

1. GOSSYPIUM *foliis quinquelobis, caule herbaceo*. *Hort. Upsal.* 203. Cotton with leaves having five lobes, and an herbaceous stalk.

2. GOSSYPIUM *foliis trilobis integerrimis*. *Hort. Upsal.* 204. Cotton with entire leaves having three lobes.

3. GOSSYPIUM *foliis palmatis, lobis lanceolatis, caule fruticoso*. *Lin Sp. Plant.* 693. Cotton with hand-shaped leaves, having five spear-shaped lobes, and a shrubby stalk.

4. GOSSYPIUM *foliis trilobis & quinquelobis acutis, caule ramo hirfuto*. Finest American Cotton with a green seed.

The first sort is the common *Levant* Cotton, which is cultivated in several islands of the *Archipelago*, as also in *Malta*, *Sicily*, and the kingdom of *Naples*; it is sown in tilled ground in the spring of the year, and is ripe in about four months after, when it is cut down in harvest as Corn in *England*, the plants always perishing soon after the seeds are ripe: this plant grows about two feet high, with an herbaceous stalk, garnished with smooth leaves divided into five lobes. The stalks send out a few weak branches upward, which are garnished with leaves of the same form but are smaller. The flowers are produced at the extremity of the branches; these have two large empalements, the outer is cut into three parts, and the inner into five. The petals of the flower are of a pale yellow colour, inclining to white; these are succeeded by oval capsules, which open in four parts, having four cells, which are filled with seeds wrapped up in a down, which is the Cotton.

The second sort grows naturally in several islands of the *West-Indies*; this rises with a shrubby smooth stalk four or five feet high, sending out a few side branches, which are garnished with smooth leaves, divided into three lobes. The flowers are produced at the end of the branches, which are shaped like those of the former sort, but are larger, and of a deeper yellow colour. The pods are larger, and the seeds are black.

The third sort hath a perennial shrubby stalk, which rises six or eight feet high, and divides into many branches, which are smooth, and garnished with hand-shaped leaves, having four or five lobes. The flowers are produced at the end of the branches; these are larger than those of the two former sorts, and are of a deep yellow colour. The pods of this sort are larger than those of the former.

The fourth sort is a native of the *East* and *West-Indies*; this is an annual plant, which perishes soon after the seeds are ripe. It rises to the height of three feet or more, and sends out many lateral branches, where they are allowed room to grow; these are hairy, and garnished with leaves, having in some three, and others five acute-pointed hairy lobes. The flowers are produced from the side, and at the ends of the branches, which are large, of a dirty sulphur colour, each petal having a large purple spot at the base; the flowers are succeeded by oval pods, which open in four cells, filled with oblong green seeds, wrapped up in a soft down. The staple of this is much finer than either of the other species, therefore it is well worth the attention of the

British colonies in *America* to cultivate and improve this sort, since it will succeed in *Carolina*, where it has been cultivated for some years; and might be a commodity worthy of encouragement by the publick, could they contrive a proper gin to separate the Cotton from the seeds, to which this sort adheres much closer than any of the other sorts, the Cotton from this shrub being preferable to any other yet known.

All these sorts are tender plants, therefore will not thrive in the open air in *England*, but they are frequently sown in curious gardens for variety; the first and fourth sorts will produce ripe seeds in *England*, if their seeds are sown early in the spring, upon a good hot-bed, and the plants afterwards planted each into separate pots, and plunged into a hot-bed of tanners bark, to bring them forward; when they are grown too tall to remain under the frames, they should be removed into the tan-bed in the stove, and shifted into larger pots, if their roots have filled the other; with this management their flowers will appear in *July*, and towards the end of *September* the seeds will ripen, and the pods will be as large as those produced in the *East* and *West-Indies*; but if the plants are not brought forward early in the spring, it will be late in the summer before the flowers will appear, and there will be no hopes of the pods coming to perfection.

The shrub Cotton will rise from the seeds very easily, if they are sown upon a good hot-bed; and when they are sown early in the spring, and brought forward in the same manner as hath been directed for the former sorts, the plants will grow to be five or six feet high the same summer; but it is difficult to preserve the plants through the winter, unless they are hardened gradually in *August* during the continuance of the warm weather; for when they are forced on in summer, they will be so tender, as to render them incapable of resisting the least injury. The plants of this sort must be placed in the bark-stove in autumn, and kept in the first class of heat, otherwise they will not live through the winter in *England*.

GRAFTING is the taking a shoot from one tree, and inserting it into another, in such a manner, as that both may unite closely, and become one tree; this is called, by the ancient writers in husbandry and gardening, incision, to distinguish it from inoculation, or budding, which they call *inferere oculos*.

The use of grafting is to propagate any curious sorts of fruits, so as to be certain of the kinds, which cannot be done by any other method; for as all the good fruits have been accidentally obtained from seeds, so the seeds of these, when sown, will many of them degenerate, and produce such fruit as are not worth cultivating: but when shoots are taken from such trees as produce good fruit, these will never alter from their kind, whatever be the stock, or tree, on which they are grafted; for though the grafts receive their nourishment from the stocks, yet they are never altered by them, but continue to produce the same kind of fruit as the tree from which they were taken; the only alteration is, that when the stocks on which they are grafted do not grow so fast, nor afford a great supply of nourishment to the grafts, they will not make near so great progress as they otherwise would do, nor will the fruit they produce be so fair, and sometimes not so well flavoured.

The shoots to be ingrafted are termed cions, or grafts; in the choice of these, the following directions should be carefully observed. 1st, That they are shoots of the former year, for when they are older, they never succeed well. 2dly, Always to take them from healthy fruitful trees, for if the trees are sickly from whence they are taken, the grafts very often partake so much of the distemper, as rarely to get the better of it, at least for some years, and when they are taken from young luxuriant trees, whose vessels are generally

large, they will continue to produce luxuriant shoots, and are seldom so fruitful as those which are taken from fruitful trees, whose shoots are more compact, and the joints closer together, at least it will be a great number of years before these luxuriant grafts begin to produce fruit, if they are managed with the greatest skill. 3dly, You should prefer those grafts which are taken from the lateral or horizontal branches, to those from the strong perpendicular shoots, for the reasons before given.

These grafts, or cions, should be cut off from the trees before their buds begin to swell, which is generally three weeks or a month before the season for grafting; therefore, when they are cut off, they should be laid in the ground with the cut downwards, burying them half their length, and covering their tops with dry litter, to prevent their drying; if a small joint of the former year's wood is cut off with the cion, it will preserve it the better, and when they are grafted, this may be cut off; for at the same time the cions must be cut to a proper length, before they are inserted to the stocks, but, till then, the shoots should remain their full length, as they were taken from the tree; if these cions are to be carried to a considerable distance, it will be proper to put their cut ends into a lump of clay, and to wrap them up in moss, which will preserve them fresh for a month, or longer.

In the choice of young stocks for grafting, you should always prefer such as have been raised from the seed, and that have been once or twice transplanted. Next to these, are those stocks which have been raised from cuttings, or layers, but those which are suckers from roots of other trees, should always be rejected, for these are never so well rooted as the others, and constantly put out a great number of suckers from their roots, whereby the borders and walks of the garden will be always pestered with them during the summer season, which is not only unsightly, but they also take off part of the nourishment from the trees.

If these stocks have been allowed a proper distance in the nursery where they have grown, the wood will be better ripened, and more compact than those which have grown close, and have been thereby drawn up to a greater height; the wood of which will be soft, and their vessels large, so that the cions grafted into them will shoot very strong, but they will be less disposed to produce fruit than the other; and when trees acquire an ill habit at first, it will be very difficult to reclaim them afterwards.

Having directed the choice of cions and stocks, we come next to the operation, in order to which you must be provided with the following tools.

1. A neat small hand-saw to cut off the heads of large stocks.

2. A good strong knife with a thick back, to make clefts in the stocks.

3. A sharp penknife to cut the grafts.

4. A grafting chissel and a small mallet.

5. Bals strings, or woollen yarn, to tie the grafts with, and such other instruments and materials as you shall find necessary, according to the manner of grafting you are to perform.

6. A quantity of clay, which should be prepared a month before it is used, and kept turned and mixed like mortar every other day, which is to be made after the following manner:

Get a quantity of strong fat loam (in proportion to the quantity of trees intended to be grafted) then take some new stonchorse dung, and break it in amongst the loam, and if you cut a little straw, or hay, very small, and mix amongst it, the loam will hold together the better; and if there be a quantity of salt added, it will prevent the clay from dividing in dry weather; these must be well stirred to-

gether, putting water to them after the manner of making mortar; it should be hollowed like a dish, and filled with water, and kept every other day stirred; but it ought to be remembered, that it should not be exposed to the frost, or drying winds, and that the oftener it is stirred and wrought the better.

Of late years some persons have made use of another composition for grafting, which they have found to answer the intention of keeping out the air, better than the clay before prescribed. This is composed of turpentine, bees wax, and rosin, melted together, which when of a proper consistence, may be put on the stock round the graft, in the same manner as the clay is usually applied, and though it be not above a quarter of an inch thick, yet will keep out the air more effectually than the clay; and as cold will harden this, there is no danger of its being hurt by frost, which is very apt to cause the clay to cleave, and sometimes fall off; and when the heat of summer comes on, this mixture will melt, and fall off without any trouble. In using of this, there should be a tin, or copper pot, with convenience under it to keep a very gentle fire with small coal, otherwise the cold will soon condense the mixture, but you must be careful not to apply it too hot, lest you injure the graft. A person who is a little accustomed to this composition, will apply it very fast, and it is much easier for him than clay, especially if the season should prove cold.

There are several ways of grafting, the principal of which are four:

1. Grafting in the rind, called also shoulder-grafting, which is only proper for large trees; by some called crown-grafting, because the grafts are set in form of a circle, or crown, and is generally performed about the latter end of *March*, or the beginning of *April*.

2. Cleft-grafting, which is called stock, or slit-grafting; this is proper for trees or stocks of a lesser size, from an inch, to two inches or more diameter; this grafting is to be performed in the month of *March*, and supplies the failure of the escutcheon way, which is practised in *June*, *July*, and *August*.

3. Whip-grafting, which is also called tongue-grafting; this is proper for small stocks of an inch, half an inch, or less, diameter; this is the most effectual way of any, and that which is most in use.

4. Grafting by approach, or ablastation; this is to be performed when the stock you would graft on, and the tree from which you take your graft, stand so near together, that they may be joined; this is to be performed in the month of *April*, and is also called inarching; it is chiefly used for *Jasmines*, oranges, and other tender exotick trees.

The manner of performing the several ways of grafting being generally known, need not be here mentioned.

The next thing which is necessary to be known by those who would practise this art, is, what trees will take and thrive by being grafted upon each other; in this article there have been no sure directions given by any of the writers on this subject, for there will be found great mistakes in most of the books which have treated on this subject; but as it would swell this article too great, if all the sorts of trees were to be here enumerated, which will take upon each other by grafting, I shall only mention such general directions, as, if attended to, will be sufficient to instruct persons, so as they may succeed.

All such trees as are of the same genus, *i. e.* which agree in their flower and fruit, will take upon each other; for instance, all the Nut bearing trees may be safely grafted on each other, as may all the Plum bearing trees, under which head I reckon not only the several sorts of *Plumbs*, but also the *Almond*, *Peach*, *Nectarine*, *Apricot*, &c. which agree exactly in their general characters, by which they

they are distinguished from all other trees ; but as many of these are very subject to emit large quantities of gum from those parts of the trees where they are deeply cut and wounded, so the tender trees of this kind, *viz.* Peaches and Nectarines, which are most subject to this, it is found to be the surest method to bud or inoculate these sorts of fruits, for which see INOCULATION.

Secondly, all such trees as bear cones will do well upon each other, though they may differ in one being ever-green, and the other shedding its leaves in winter, as is observable in the Cedar of *Lebanus*, and the Larch tree, which are found to succeed upon each other very well ; but these must be grafted by approach, for they abound with a great quantity of resin, which is apt to evaporate from the graft, if separated from the tree before it is joined with the stock, whereby they are often destroyed ; as also the Laurel on the Cherry, or the Cherry on the Laurel. All the mast-bearing trees, which also take upon each other, and those which have a tender soft wood, will do well, if grafted in the common way, but those that are of a more firm texture, and are slow growers, should be grafted by approach.

By strictly observing this rule we shall seldom miscarry, provided the operation be rightly performed, and at a proper season, unless the weather should prove very bad, as it sometimes happens, whereby whole quarters of fruit trees miscarry ; it is by this method that many kinds of exotick trees are not only propagated, but also rendered hardy enough to endure the cold of our climate in the open air ; for, being grafted upon stocks of the same sort, which are hardy, the grafts are rendered more capable to endure the cold ; as hath been experienced in most of our valuable fruits now in *England*, which were formerly transplanted hither from more southerly climates, and were at first too impatient of our cold to succeed well abroad, but have been by budding or grafting upon more hardy trees, rendered capable of resisting our severest cold.

GRAMEN. *Tourn. Inst. R. H.* 516. Grasses.

To enumerate all the species of Grasses which are found growing naturally in *England*, would swell this article greatly beyond the design of the work ; therefore I shall only mention a few species, which are either used in medicine, or cultivated as a pabulum for cattle ; for there is scarce a pasture in this country, where at least twenty different species are not to be found intermixed, and in most of them more than twice that number.

1. GRAMEN *spicâ triticeâ repens vulgare, caninum dictum.* *Raii Syn.* 2. p. 247. Common creeping Grass with a spike like Wheat, called Dog or Couch Grass.

2. GRAMEN *loliaceum, angustiore folio & spicâ.* *C. B. P.* Darnel with a chaffy spike, commonly called Ray, or Rye Grass.

3. GRAMEN *pratense, paniculatum majus, angustiore folio.* *C. B. P.* 2. Meadow Grass, with larger panicles and a narrower leaf.

4. GRAMEN *pratense paniculatum majus, latiore folio.* *C. B. P.* 2. Meadow Grass, with a larger panicle and broader leaf.

5. GRAMEN *avenacium pratense clatius, paniculâ flavescente, locustis parvis.* *Raii Syn.* 407. Taller Meadow Oat Grass, with a yellowish panicle and small husks.

6. GRAMEN *secalinum.* *Ger. Emac. lib. 1. cap. 22. n. 4.* Tall meadow Rye Grass.

7. GRAMEN *tremulum maximum.* *C. B. P.* 2. Greatest quaking Grass, or Cowquakes.

The first sort of Grass is that which is directed to be used in medicine ; the roots of this are chiefly used, and are accounted aperitive and diuretick, opening obstructions of the reins and bladder, provoking urine, and are of service against the gravel and stone. The juice of the leaves and stalks was greatly esteemed by *Dr. Boerhaave*, who gene-

rally prescribed this in all cases where he supposed there were any obstructions in the bile conduit.

This hath a creeping root, which spreads far in the ground, and is a very troublesome weed in gardens and arable land ; for every small piece of the root will grow and multiply exceedingly, so it is very difficult to extirpate where it once gets possession in gardens ; the common method of destroying it is, to fork out the roots as often as the blades appear above ground ; where this is two or three times carefully repeated, it may be totally rooted out ; but when the surface of the ground is very full of the roots of this Grass, the shortest way of destroying it, is to trench the ground two spits and a shovelling deep, turning all the couch into the bottom, where it will rot, and never shoot up ; but this can only be practised, where there is sufficient depth of soil, for in shallow ground the roots cannot be buried so deep, as to lie below the depth which they naturally shoot.

Where the roots of this Grass get possession in arable fields, it is very difficult to root out again ; the usual method is by laying the land fallow in summer, and frequently harrowing it well over to draw out the roots ; where this is carefully practised, the ground may be so well cleaned in one summer, as that the roots cannot much injure the crop which may be sown upon it ; but such land should be cropped with such things as require the horse hoeing culture, for where the land can be frequently stirred and harrowed afterward, it will be of great service in cleaning it from the roots of this Grass and other bad weeds. The blade of this Grass is so rough, that cattle will not feed upon it.

The second sort is frequently cultivated, especially in strong cold land, upon which this Grass will succeed better than any other species, and is an earlier feed in the spring ; but this is a very coarse Grass, and unless it is cut very early for hay, it becomes hard and wieri in the stalks, so that few cattle care to eat it : this species has few leaves, running all to stalk, so is usually called bents, and in some counties bennet ; when this Grass is fed, it will be proper to mow off the bents in the beginning of *June*, otherwise they will dry, and have the appearance of a stubble field all the latter part of the summer ; so that it will not only be very disagreeable to the sight, but also troublesome to the cattle that feed on it, by tickling their nostrils ; so that the want of better pasture only, will force them to eat of the young Grass which springs up between these bents, for those they will not touch ; therefore those who suppose that these are eaten in scarcity of feed by the cattle, are greatly mistaken, for I have many years closely attended to this, and have always found these bents remaining on the ground untouched, till the frost, rain, and winds destroy it in winter ; and by permitting these to stand, the after growth of the Grass is greatly retarded, and the beautiful verdure is lost for three or four months ; so that it is good husbandry to mow them before they grow too dry, and rake them off the ground ; if these are then made into hay, it will serve for cart-horses feed in winter, and will pay the expence of mowing it.

There is another species of this Grass called Red Darnel, which is of a worse nature than the first, the stalks growing hard much sooner, and having narrower leaves : this is very common in moist pasture grounds, for as it comes early to flower, so the seeds are generally ripe before the hay is cut, and from the falling seeds the ground is supplied with plenty of this sort ; therefore those who are desirous to keep their pastures as clear from this Grass as possible, should always mow it before the seeds are ripe.

This Grass is usually sown with Clover, upon such lands as are designed to be ploughed again in a few years, and the common method is to sow it with spring Corn ; but from many repeated trials, I have always found, that by sowing

these seeds in *August*, where there has happened a few showers to bring up the Grass, that the crop has answered much better than any which has been sown in the common way; so that I am convinced of that being the best season for sowing these Grasses, though it will be very difficult to persuade those persons to alter their practice, who have been long wedded to old customs. The quantity of seeds which I allow to an acre is about two bushels, and eight pounds of the common white Clover, which, together, will make as good plants upon the ground as can be desired; but this is not to be practised upon such lands where the beauty of the verdure is principally regarded, therefore is fit for those who have only profit in view.

The third and fourth sorts are the two best species of Grass for pastures, so that if the seeds of these were carefully collected and sown separately, without any other mixture of Grass seeds, they would not only afford a greater quantity of feed on the same space of land, but the Grass would also be better, the hay sweeter, and the verdure more lasting than of any other sort; but there requires some attention to the saving of these seeds pure without mixture. I have tried to save the seeds of several species of Grass separately, in order to determine their qualities, but have found it very difficult to keep them distinct in gardens where the seeds of other sorts of Grass have been scattered; the only method in which I could succeed, was by sowing each species in a distinct pot, and when the plants came up, to weed out all the other kind of Grass which came up in the pots; by this means I preserved a great variety of the grassy tribe several years, but not having ground enough to propagate the most useful species in any quantity, I was obliged to abandon the pursuit; but I must recommend this to persons of leisure and skill, who have a sufficient quantity of land for the purpose, to carry this project into execution, which may be of singular benefit to the publick; for we have an instance of the advantage which the inhabitants of the *Netherlands* have made, by saving the seeds of the White Clover, or Honeyfuckle Trefoil, which is a plant common to most of the *English* pastures, yet no person in this country ever gave themselves the trouble, till within a few years past, to collect the seeds from the fields for sowing, but have purchased vast quantities of it annually, at a considerable price from *Flanders*, where the peasants have been so industrious, as to collect the seeds and sow great quantities of land with it, with a view of sale to this country only.

The fifth and sixth sorts are also very good Grasses for pastures, and have perennial roots, so are the next best sorts for sowing to those before-mentioned, which, in my opinion, deserve the preference to all the other; but as it will be difficult to save a sufficient quantity of seeds of those alone, to supply the demand which may be for their seeds, so these two species may be admitted in aid of the other, as they are very leafy kinds of Grass, and their stalks do not become stiff and harsh like many other species, but with proper care may be made very fine, and if duly rolled, their roots will mat and form a very close sward, therefore these should be included in the number of sown Grasses.

The seventh sort is mentioned for the sake of variety, and not for use; this hath an annual root, which sends up many broad hairy leaves, between which arise slender stiff stalks from a foot to near two feet high, dividing upward into a large loose panicle, garnished with heart-shaped small spikes, each having about seventeen small floscules or florets, which have a single seed succeeding them; the heads hang by slender long foot-stalks, which are moved by every wind, so that they generally appear shaking, from whence it had the title of Quaking Grass. There are four species of this Grass, two of them grow naturally in *England*,

which coming to head in *May*, occasioned the following *English* proverb, *May, come she early come she late, makes the cow quake.* The large sort here mentioned, grows naturally in the south of *France* and *Italy*, and is only preserved in some *English* gardens for the sake of variety.

The land upon which Grass seed is intended to be sown, should be well ploughed, and cleared from the roots of noxious weeds, especially if the Grass is to remain for pasture, such as Couch Grass, Fern, Rushes, Heath, Gorse, Broom, Rest-harrow, &c. which, if left in the ground, will soon get the better of the Grass, and over-run the land. Therefore in such places where either of these weeds abound, it will be a good method to plough up the surface in *April*, and let it lie some time to dry; then harrow the roots into small heaps, and burn them. The ashes so produced, when spread on the land, will be a good manure for it. But where Couch Grass, Fern, or Rest-harrow is in plenty, whose roots run far under ground, the land must be ploughed two or three times pretty deep in dry weather, and the roots carefully harrowed off after each ploughing, which is the most sure method to destroy them. Where the land is very low, and of a stiff clayey nature, which holds water in winter, it will be of singular service to make some under-ground drains to carry off the wet; which, if detained too long on the ground, will render the Grass sour.

Before the seed is sown, the surface of the ground should be made fine and level, otherwise the seed will be buried unequal. When the seed is sown, it must be gently harrowed in, and the ground rolled with a wooden roller, which will make the surface even, and prevent the seeds being blown in patches. When the Grass comes up, if there should be any bare spots, where the seed has not grown, they may be sown again, and the ground rolled, which will fix the seeds; and the first kindly showers will bring up the Grass, and make it very thick.

The proper management of pasture land, is certainly the least understood of any part of agriculture; the farmers never have attended to this, being more inclined to the plough; though the profits attending it have not of late years been so great, as to encourage them in that part of husbandry; but these people never think of laying down land for pasture, to continue longer than three years, at the end of which time they plough it up again, to sow it with grain.

Clover Grass. See *Trifolium*.

Saint Foin. See *Onobrychis*.

La Lucerne. See *Medica*.

Noneuch. See *Melilotus*.

Trefoil. See *Trifolium*.

Spurry. See *Spergula*.

GRANADILLA. See *Passiflora*.

GRAPES. See *Vitis*.

GRATIOLA. *Lin. Gen. Plant.* 27. Hedge Hyssop.

The Characters are,

The flower hath one petal of the grining kind, cut at the top into four small segments. It hath five awl-shaped stamina; the other two are longer, and adhere to the tube of the petal. In the center is situated a conical germen, which after-ward becomes an oval capsule, ending in a point, having two cells which are filled with small seeds.

The Species are,

1. GRATIOLA *floribus pedunculatis, foliis lanceolatis serratis.* *Lin. Mat. Med.* 18. Hedge Hyssop with flowers standing on foot-stalks, and spear-shaped sawed leaves.

2. GRATIOLA *foliis lanceolatis obtusis sub dentatis.* *Flor. Virg.* 6. Hedge Hyssop with obtuse indented leaves.

3. GRATIOLA *floribus subsessilibus.* *Lin. Sp. Plant.* 17. Hedge Hyssop with flowers sitting close to the branches.

The first sort grows naturally on the *Alps*, and other mountainous parts of *Europe*. It hath a thick, fleshy, fibrous creeping root, which propagates very much when planted in a proper soil or situation, from which arise several upright square stalks, near a foot high, garnished with narrow spear-shaped leaves placed opposite; the flowers are produced on the side of the stalks at each joint, they are shaped like those of the Foxglove, but are small, and of a pale yellowish colour.

It is easily propagated by parting of the roots; the best time to do this is in the autumn, when the stalks decay; the plants should have a moist soil and a shady situation, in which they will thrive exceedingly; but in dry ground they often decay in summer, unless they are plentifully watered.

The second sort grows naturally in *North America*, where it rises more than a foot high, but in *England* I have not seen it more than eight inches; the leaves are blunt and indented at their extremities; the flowers are white, and come out from the side of the stalks, like those of the other, but are not succeeded by seeds here. It may be propagated in the same manner as the first sort, and requires the same treatment.

The seeds of the third sort were sent me from *Carthage*, where it was found growing naturally in places where there had been standing waters, which were then dried up; this plant grew about nine inches high, with a weak stalk, and the leaves placed opposite; they were about three quarters of an inch long, and half an inch broad, sawed on their edges; the flowers came out single on each side the stalk, they were white, and much smaller than those of the first sort, but were not succeeded by seeds, so the plant was lost here.

GRAVEL and Grasse are naturally ornaments to a country seat, and the glory of the *English* gardens, in which we excel most other nations. Indeed, most people who have had the designing of gardens, have too much considered gravel as an ornament, so have made too many walks in gardens, and those have been much too broad, for the sight of gravel is not very pleasing, so it ought only to be considered as useful; a dry walk quite round, or to each part of a garden being absolutely necessary; but these, in gardens of great extent, need not be more than nine or ten feet wide, and in small ones five or six.

There are different sorts of gravel, but for those who can conveniently have it, I approve of that gravel on *Blackheath*, as preferable to most that we have in *England*; it consisting of smooth even pebbles, which, when mixed with a due quantity of loam, will bind exceeding close, and look very beautiful, and continue handsome longer than any other sort of gravel which I have yet seen.

There are many kinds of gravel which do not bind, and thereby cause a continual trouble of rolling, to little or no purpose; as for such,

If the gravel be loose, or sandy, you should take one load of strong loam, to two or three of gravel, and so cast them well together, and turn this mixture over three or four times, that they may be well blended together; if this is done in proper proportion, it will bind well, and not stick to the feet in wet weather.

There are many different opinions about the choice of gravel; some are for having the gravel as white as possible, and in order to make the walks more so, they roll them well with stone rollers, which are often hewn by the masons that they may add a whiteness to the walks; but this renders it very troublesome to the eyes, by reflecting the rays of light too strongly; therefore this should ever be avoided, and such gravel as will lie smooth, and reflect the least, should be preferred.

Some are apt to lay gravel walks too round, but this is likewise an error, because they are not so good to walk upon, and, besides, it makes them look narrow; one inch rise is enough in a crown for a walk of five feet, and it will be sufficient if a walk be ten feet wide, that it lies two inches higher in the middle than it does on each side.

For the depth of gravel walks, six or eight inches may do well enough, but a foot thickness will be sufficient for any; but then there should always be a depth of rubbish laid under the gravel, especially if the ground is wet, in which case there cannot be too much care taken to fill the bottom of the walks with large stones, flints, brick rubbish, chalk, or any other materials which can be best procured, which will drain off the moisture from the gravel, and prevent its being poachy in wet weather; but as it may be difficult in some places to procure a sufficient quantity of these materials to lay in the bottom of the walks, so there may be a bed of heath, or furze, which ever can be procured at the least expence, laid under the gravel to keep it dry: if either of these are used green, they will lie a long time, as they will be covered from air, and these will prevent the gravel from getting down into the clay, and will always keep the gravel dry; where there is not this precaution in the first laying of gravel upon clay, the water being detained by the clay, will cause the gravel to be poachy whenever there is much rain.

In the making of gravel walks, there must be great regard had to the level of the ground, so as to lay the walks with easy descents toward the low parts of the ground, that the wet may be drained off easily, for when this is omitted, the water will lie upon the walks a considerable time after hard rains, which will render them unfit for use, especially where the ground is naturally wet or strong; but where the ground is level, and there are no declivities to carry off the wet, it will be proper to have sink-stones laid by the sides of the walks, at convenient distances to let off the wet; and where the ground is naturally dry, that the water will soon soak away, the drains from the sink-stones may be contrived so as to convey the water into cesspools, from which the water will soak away in a short time; but in wet land there should be under-ground drains to convey the wet off, either into ponds, ditches, or the nearest place to receive it, for where this is not well provided for, the walks will never be so handsome or useful.

The month of *March* is the properest time for laying gravel; it is not prudent to do it sooner, or to lay walks in any of the winter months before that time.

If constant rolling them after the rains and frost will not effectually kill the weeds and moss, you should turn the walks in *March*, and lay them down at the same time.

In order to destroy worms that spoil the beauty of gravel, or grass walks, some recommend the watering them well with water, in which Walnut tree leaves have been steeped, and made very bitter, especially those places most annoyed with them; and this, they say, as soon as it reaches them, will make them come out hastily, so that they may be gathered; but if, in the first laying of the walks, there is a good bed of lime rubbish laid in the bottom, it is the most effectual method to keep out the worms, for they do not care to harbour near lime.

GREEN-HOUSE, or Conservatory.

As of late years there have been great numbers of curious exotic plants introduced into the *English* gardens, so there has been an increase of conservatories to preserve them; and not only a greater skill in the management and ordering of these plants has increased therewith, but also a greater knowledge of the structure and contrivance of these places, so as to render them both useful and ornamental, hath been acquired. Therefore I have not only given the best instructions

for this I was capable of, but also a design of one in the manner I would choose to erect it, upon the annexed copper plate.

As to the length of these houses, that must be proportioned to the number of plants they are to contain, or the fancy of the owner, but their depth should never be greater than their height in the clear, which in small, or middling houses, may be sixteen or eighteen feet, but for large ones, from twenty to twenty-four feet, is a good proportion; for if the green-house is long, and too narrow, it will have a bad appearance both within and without, nor will it contain so many plants, if proper room be allowed for passing in front, and on the backside of the stands on which the plants are placed; and, on the other hand, if the depth of the green-house is more than twenty-four feet, there must be more rows of plants placed to fill the house, than can with conveniency be reached in watering and cleaning; nor are houses of too great depth so proper for keeping of plants, as those of a moderate size.

The windows in front should extend from about one foot and a half above the pavement, to within the same distance of the ceiling, which will admit of a cornice round the building, over the heads of the windows. As it is necessary to have these windows so long, it will be impossible to make them in proportion as to their breadth; for if in the largest buildings the sashes are more than seven, or seven feet and a half broad, they will be so heavy, and troublesome to move up and down, as to render it very difficult for one person to perform; besides, their weight will occasion their soon decaying. There is also another inconvenience in having the windows too broad, which is, that of fixing proper shutters to them, in such a manner, as that they may fall back close to the piers, so as not to be incommodious, or, when open, to obstruct any part of the rays of light from reaching the plants. The piers between these windows should be as narrow as possible to support the building, for which reason I should choose to have them of stone, or of hard well-burnt bricks, for if they are built with fine rubbed bricks, those are generally so soft, that the piers will require to be made thicker, or the building will be too weak to support the weight, especially if there are rooms over the green-house; which is what I would always advise, as being of great use to keep the frost out in very hard winters. If these piers are made of stone, I would advise them to be two feet and a half in front, and sloped off backward to about eighteen inches broad, whereby the rays of the sun will not be taken off, or obstructed by the corners of the piers, which it would be if they were square; but if they are built with bricks, it will be proper to make them three feet in front, otherwise they will be too slender; these I would also advise to be sloped off, in the manner directed for the stone.

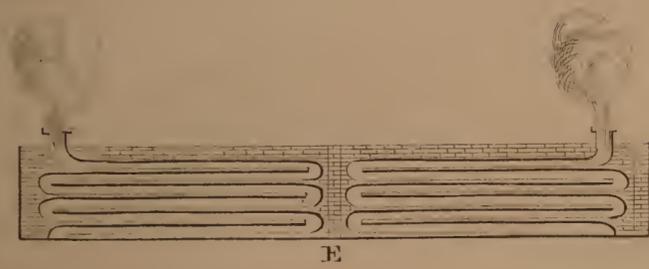
At the back of the green-house there may be erected a house for tools, and many other purposes, which will be extremely useful to prevent the frost from entering the house that way, so that the wall between these need not be more than two bricks and a half in thickness; whereas, were it quite exposed behind, it should be at least three bricks or three and a half in thickness; by having a shed behind, if you are willing to make a handsome building, and to have a noble room over the green-house, you may make part of the room over the tool-house, and carry up the staircase in the back, so as not to be seen in the green-house, and hereby a room twenty-five or thirty feet in width may be contrived, and of a proportionable length; and under this staircase there may be a private door into the green-house, at which the gardener may enter in hard frosty weather, when it will not be safe to open any of the glasses in front. The floor of the green-house, which

should be laid either with *Bremen* squares, *Purbeck* stone, or broad tiles, according to the fancy of the owner, must be raised two feet above the surface of the ground whereon the house is placed, which, in dry ground, will be sufficient; but if the situation is moist and springy, and thereby subject to damps, it should be raised at least three feet above the surface; and if the whole is arched with low brick arches under the floor, it will be of great service in preventing the damps rising in winter, which are often very hurtful to the plants, especially in thaws, when the air is often too cold to be admitted into the house, to take off the damps. Under the floor, about two feet from the front, I would advise a flue of about twelve inches in width, and two feet deep, to be carried the whole length of the house, which may be returned along the back part, and be carried up in proper funnels adjoining to the tool-house, by which the smoke may pass off. The fire place may be contrived at the ends of the house, and the doors at which the fuel is put in, as also the ash grate, may be contrived to open into the tool-house, so that it may be quite hid from the sight, and be in the dry, and the fuel may be laid in the same place, whereby it will always be ready for use.

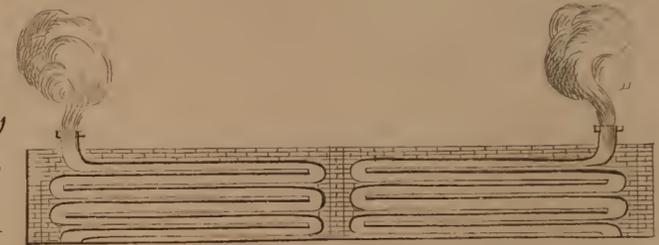
I suppose many people will be surprised to see me direct the making of flues under a green-house, which has been disused so long, and by most people thought of ill consequence, as indeed they have often proved, when under the direction of unskilful managers, who have thought it necessary, whenever the weather was cold, to make fires therein; but however injurious flues may have been under such management, yet, when skilfully used they are of very great service; for though, perhaps, it may happen, that there will be no necessity to make any fires in them for two or three years together, when the winters prove mild, yet in very hard winters they will be extremely useful to keep out the frost, which cannot be effected any other way, but with great trouble and difficulty.

Within side of the windows, in front of the green-house, you should have good strong shutters, which should be made with hinges, to fold back, that they may lie quite close to the piers, that the rays of the sun may not be obstructed thereby. These shutters need not to be above an inch and a half thick, or little more, when wrought, which, if made to join close, will be sufficient to keep out our common frost; for when the weather is so cold as to endanger the freezing in the house, it is but making a fire in your flues, which will effectually prevent it, and without this conveniency it will be very difficult to effect; for where persons are obliged to nail mats before their windows, or to stuff the hollow space between the shutters and the glass with straw, this is commonly suffered to remain till the frost goes away; which if it should continue very long, the keeping the green-house closely shut up, will prove very injurious to the plants; and as it frequently happens, that we have an hour or two of sun-shine in the middle of the day, in continued frosts, which is of great service to plants, when they can enjoy the rays thereof through the glasses, so, when there is nothing more to do than to open the shutters, which may be performed in a very short time, and as soon shut again when the sun is clouded, the plants may have the benefit thereof whenever it appears; whereas, where there is so much trouble to uncover, and as much to cover again, it would take up the whole time in uncovering and shutting them up, and thereby the advantage of the sun's influence would be lost. Besides, where there is so much trouble required to keep out the frost, it will be a great chance if it be not neglected by the gardener; for if he be not as fond of preserving his plants, and as much in love with them, as his master, this labour will be thought too great by him; and if he takes the pains to cover the glasses up with mats, &c. he will

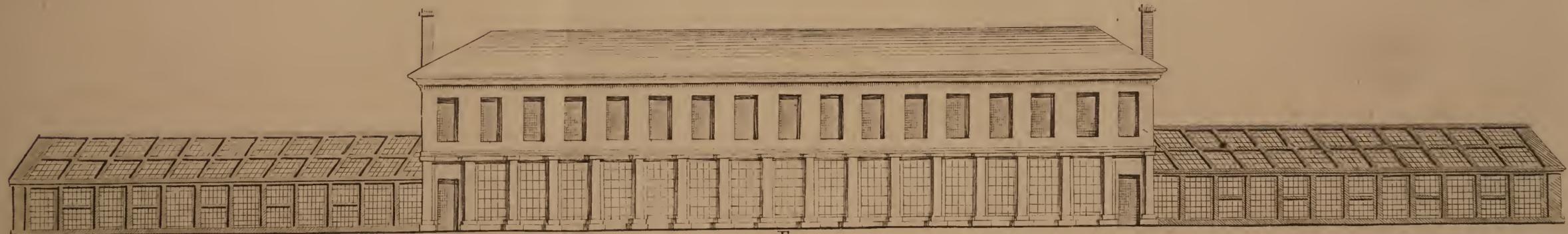
- A. The Ground Plan of the Green-house.
- B.B. The Ground Plan of the two Stoves.
- C.C.C. The Sheds behind the Green-house and Stoves.
- D.D. The passage of communication between the Green-house and Stoves, where the Stairs are placed which lead to the Rooms over the Green-house.
- E.E. The Section of the Flues in the back of the Stoves.
- F. The upright of the Green-house and Stoves.



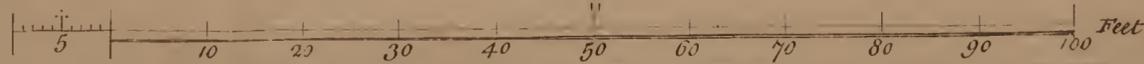
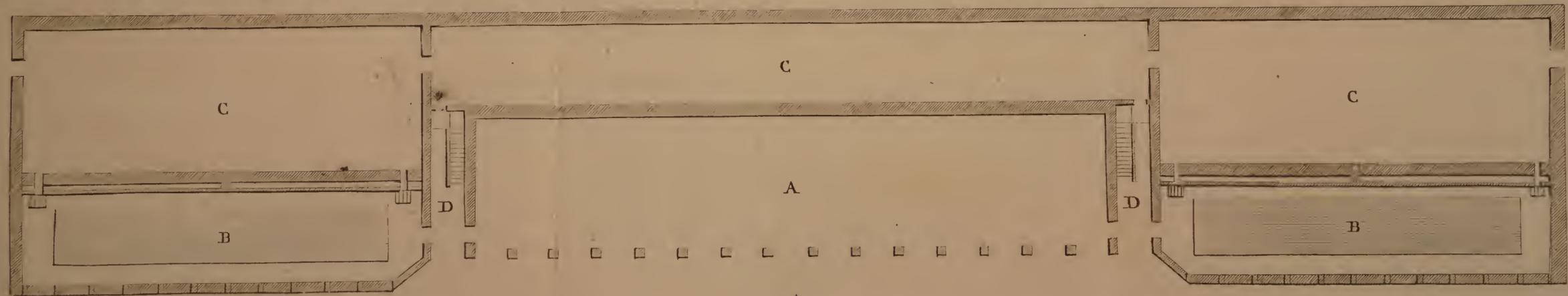
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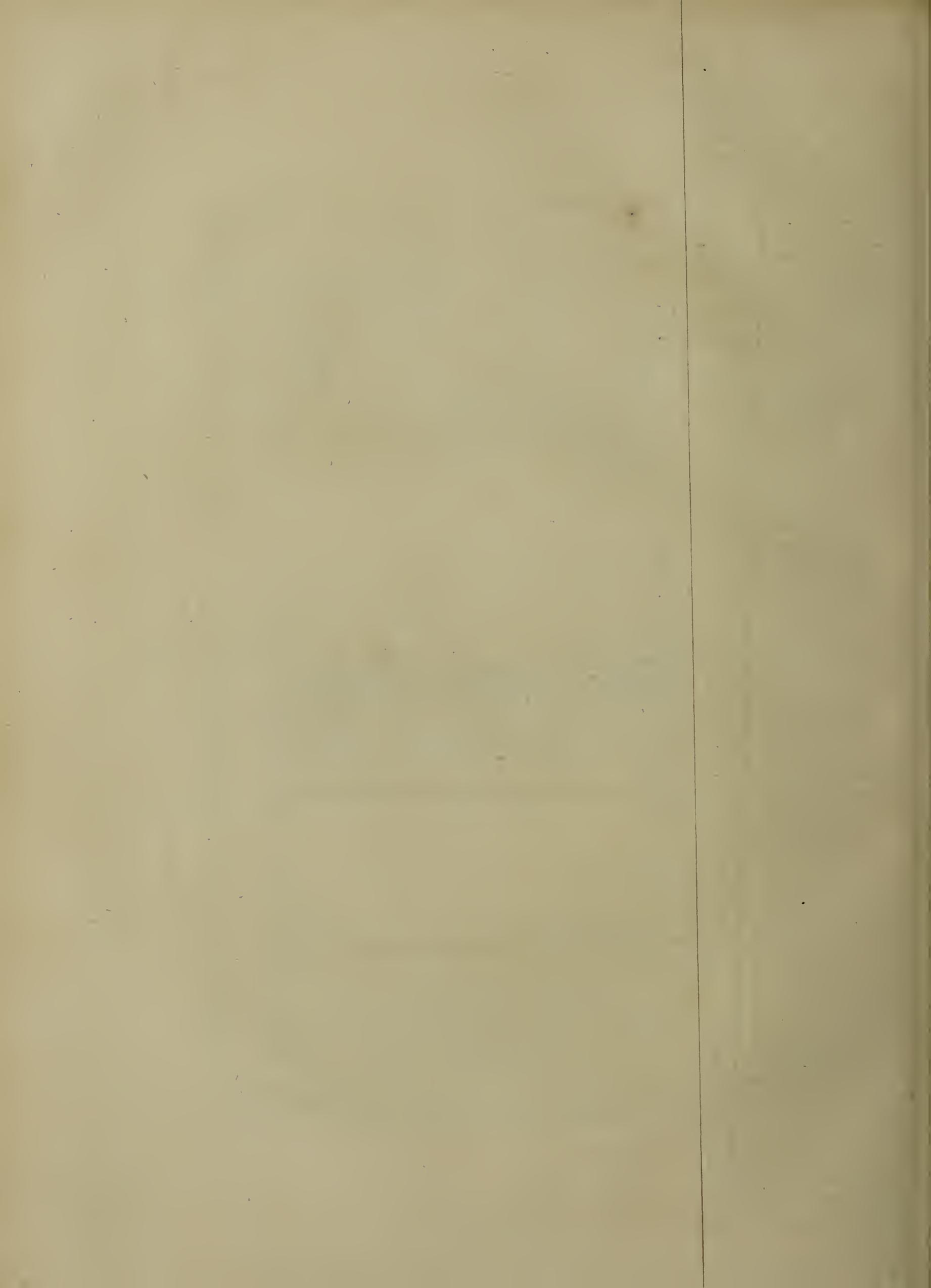
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F



J. Haynes Sculp.



will not care to take them away again until the weather alters, so that the plants will be shut up close during the whole continuance of the frost.

The back part and ends of the house should be either laid over with stucco, and painted white, or plastered with good mortar, and white washed, for otherwise the air in severe frost will penetrate through the walls, especially when the frost is attended with a strong wind, which is often the case in most severe winters.

Where green-houses are built in such places as will not admit of rooms over them, they should be contrived after the manner of stoves, with upright glasses in front, and sloping glasses over these toward the back. If the building is well executed, with proper flues in it, plants may be better preserved therein, and have more air and sun, than in the most extensive buildings of the other sort.

In the green-house there should be moveable tressels, which may be carried out and into the house occasionally, upon which should be fixed rows of planks, for the pots, or tubs of plants to stand in regular rows one above another, whereby the heads of the plants may be so situated, as not to interfere with each other. The lowest row of plants, which should be the forwardest towards the windows, should be placed about four feet therefrom, that there may be a convenient breadth left next the glasses to walk in front; and at the back side of the house there should be allowed a space of at least four feet, for the convenience of watering and passing behind the plants. The plants should never be crowded too close to each other, but room left for the air to pass freely between them.

To avoid the inconvenience which attends the placing of plants of very different natures in the same house, it will be very proper to have two wings added to the main green-house, which, if situated in the manner expressed in the annexed plan, will greatly add to the beauty of the building, and also collect a greater share of heat. In this plan the green-house is placed exactly fronting the south, and one of the wings faces the south south east, and the other the south south west; so that from the time of the sun's first appearance upon any part of the building, until it goes off at night, it is constantly reflected from one part to the other, and the cold winds are also better kept off from the front of the main green-house hereby; and in the area of this place may be contrived a place where many of the most tender exotic plants, which will bear to be exposed in the summer season to be set abroad; and in the spring, before the weather will permit to set out the plants, the beds and borders of this area may be full of Anemonies, Ranunculuses, early Tulips, &c. which will be past flowering, and the roots fit to take out of the ground by the time the plants can be carried out, which will render this place very agreeable during the spring season, when the flowers are blown: and here a person may walk and divert himself in a fine day, when, perhaps, the air in most other parts of the garden will be too cold for those who are not much used thereto.

In the center of this area may be contrived a small basin for water, which will be very convenient for watering of the plants, and add much to the beauty of the place; besides, the water, being thus situated, will be softened by the heat which will be reflected from the glasses upon it, whereby it will be rendered much better than raw cold water for these tender plants.

The two wings of the building should be contrived so as to maintain plants of different degrees of tenderness, which may be effected by the situation and manner of conducting the flues, a particular account of which will be exhibited under the article of STOVES. But I would here observe, that the wing facing the south south east should always be pre-

ferred for the warmest stove, its situation being such, as that the sun, upon its first appearance in the morning, shines directly upon the glasses, which is of great service in warming the air of the house, and adding life to the plants, after having been shut up during the long nights in the winter season. These wings, being in the draught annexed, allowed sixty feet in length, may be divided in the middle by partitions of glass, with glass doors to pass from one to the other. To each of these there should be a fire place, with flues carried up against the back wall, through which the smoke should be made to pass, as many times the length of the house, as the height will admit of their number; for the longer the smoke is passing before it is vented, the more heat will be given to the house, with a less quantity of fuel, which is an article worth consideration, especially where fuel is dear. By this contrivance you may keep such plants as require the same degree of heat in one part of the house, and those which will thrive in a much less warmth in the other part, but this will be more fully explained under the article of STOVES.

In the building these wings, if there are not sheds running behind them their whole length, the walls should not be less than three bricks thick; and if they are more, it will be better, because, where the walls are thin, and exposed to the open air, the cold will penetrate them, and when the fires are made, the heat will come out through the walls, so that it will require a larger quantity of fuel, to maintain a proper temperature of warmth in the house. The back part of these houses having sloping roofs, which are covered either with tiles or slates, should also be lined with reeds, &c. under the covering, which will keep out the cold air, and save a great expence of fuel; for the closer and better these houses are built, and the closer the glasses of the slope and front shut, the less fuel will be required to warm the houses; so that the first expence in building these houses properly, will be the cheapest, when the after expence of fires is taken into consideration.

The sloping glasses of these houses should be made to slide, and take off, so that they may be drawn down more or less, in warm weather, to admit air to the plants; and the upright glasses in front may be so contrived, as that every other may open as doors upon hinges, and the alternate glasses may be divided into two; the upper part of each should be contrived so as to be drawn down like sashes, so that either of these may be used to admit air, in a greater or less proportion, according as there may be occasion.

GREWIA. *Lin. Gen. Plant.* 914.

The Characters are,

The flower has a thick coloured empalement. It hath five petals, which are indented at their base, where is situated a scaly nectarium to each. It hath many bristly stamina. In the center is situated the roundish germen, which is lengthened in form of a column, afterward becomes a four-cornered berry with four cells, each inclosing one globular seed.

The Species are,

1. GREWIA *foliis subovatis crenatis.* Grewia with oval crenated leaves.
2. GREWIA *foliis ovato-lanceolatis serratis.* Grewia with oval spear-shaped leaves, which are sawed.

The first sort has been long preserved in many curious gardens, both in England and Holland, and is figured by Dr. Plukenet, by the title of *Ulmifolia arbor Africana baccifera, floribus purpureis.* It grows naturally at the Cape of Good Hope, from whence I have received the seeds.

This will grow to the height of ten or twelve feet; the stem and branches are very like those of the small leaved Elm, the bark being smooth, and of the same colour as that when young; the leaves are also very like those of the Elm, and fall off in autumn; the flowers are produced singly along

along the young branches, from the wings of the leaves, which are of a bright purple colour.

This may be propagated by cuttings, or layers; if by cuttings they should be taken off, and planted in *March*, before the buds begin to swell, for they do not succeed so well after; these cuttings should be planted in small pots filled with loamy earth, and the pots plunged into a moderate hot-bed of tanners bark, and shaded from the sun in the middle of the day; these will take good root in about four months, and may then be gradually inured to bear the open air, in to which they should be removed, and placed in a sheltered situation, where they may remain till autumn, when they must be removed into the green-house; the best time to lay down the layers of this plant is in the spring, before the buds come out, and these will be rooted by the same time the following year, when they may be cut off from the old plants, and planted each into a separate pot filled with soft loamy earth.

The best time to remove or transplant this plant is, either in the spring, just before the buds begin to swell, or in autumn, when the leaves begin to drop; for in summer, when the plants are in full leaf, it will not be so proper to disturb them.

In winter these plants should be placed in the green-house, for they are too tender to live abroad in *England*; but they should have as much free air as possible in mild weather, as they only require to be protected from frost, and after the leaves are fallen, they will require very moderate watering, but in summer they should have it more constantly in dry weather.

The seeds of the second sort were sent me by *Monf. Richard*, gardener to the king of *France*, at *Marseilles*, which were brought from *Senegal*, in *Africa*, by *Monf. Adanson*; it rises in this country with a shrubby stalk five or six feet high, sending out many lateral branches, which are covered with a brown hairy bark, and garnished with oval spear-shaped leaves, having several transverse veins from the mid rib to the sides, where they are sawed; they are placed alternately on the branches; the plants are young, so have not as yet flowered in *England*, therefore I can give no further account of them.

This sort is tender, so will not thrive in *England*, unless it is placed in a warm bark stove; for the plants which have been placed on shelves in a dry stove have made little progress; therefore the only method to have them succeed, is to place them in the bark-bed in the tan-stove, where the plants have grown very well. In summer these plants require a good share of free air to be admitted to them, and should have water three or four times a week in warm weather; but in winter they must be sparingly watered, and require to be kept warm.

GRONOVIA. *Martyn. Cent. 4. Lin. Gen Plant. 248.*

The Characters are,

The flower hath a permanent coloured empalement. It hath five small petals which are fixed to the cuts of the empalement, and five hairy stamina, which are inserted into the empalement. The germen is situated under the flower, which afterward becomes a roundish coloured fruit with one cell, inclosing one large roundish seed.

We know but one Species of this genus, viz.

GRONOVIA. *Hort. Cliff. 74. Houst. Climbing Burry Gronovia.*

This plant was discovered by the late *Dr. Houstoun* at *La Vera Cruz*. It is an annual plant, which sends forth many trailing branches like those of the Cucumber, which are closely set with broad green leaves, in shape like those of the Vine; which are covered with small spines on both sides, which sting like the Nettle; the branches have many tendrils or clasps, by which they fasten themselves to what-

ever plants they grow near, and will rise to the height of six or eight feet; the flowers are small, and of a greenish yellow colour, so make no great appearance.

This being a very tender plant, must be raised on a hot-bed early in the spring, and afterward placed in the bark-stove, and treated in the same way as the *Momordica*, with which management it will produce ripe seeds; but this, having neither use or beauty, is rarely cultivated but in botanick gardens for the sake of variety.

GROSSULARIA. *Raii Meth. Plant. 145. Gooseberry.*

The Characters are,

The flower has a permanent empalement, cut into five parts at the top, which is concave and coloured. It hath five small, obtuse, erect petals, which rise from the border of the empalement; and five awl-shaped stamina, which are inserted into the empalement. The germen is situated below the flower, and afterward becomes a globular berry having a navel, with one cell which is filled with roundish compressed seeds included in a pulp.

This and the common Currant agreeing with each other in their characters, are by botanists joined in the same genus, but I have chosen to treat of them separately, for the benefit of those who have not any knowledge in botany.

The Species are,

1. GROSSULARIA *ramis reclinatis aculeatis, pedunculis triphyllis.* Prickly Gooseberry with a dark purplish fruit.

2. GROSSULARIA *ramis aculeatis, baccis hirsutis.* Gooseberry with prickly branches and hairy berries.

3. GROSSULARIA *ramis aculeatis, erectis, baccis glabris.* Gooseberry with erect prickly branches, and smooth berries.

4. GROSSULARIA *ramis undique aculeatis.* Gooseberry whose branches are armed on all sides with spines.

5. GROSSULARIA *aculeis subaxillaribus, baccis aculeatis racemosis.* Gooseberry with spines on the lower part of the branches, and prickly berries growing in clusters.

The sorts which are here enumerated, are supposed to be distinct species, but there are several other varieties which have been obtained from seeds, and are propagated for sale in the nurseries; most of these are titled from the persons who raised them, as *Lamb's* Gooseberry, *Hunt's* Gooseberry, *Edwards's* Gooseberry, &c. and as there are frequently new varieties obtained, so it is needless to enumerate them here, therefore I shall proceed to their culture.

These are propagated either by suckers taken from the old plants, or by cuttings; the latter of which I prefer to the former, because those plants which are produced from suckers are always more disposed to shoot out a greater number of suckers from their roots, than such as are raised from cuttings, which generally form much better roots.

The best season for planting these cuttings is in autumn, just before their leaves begin to fall; observing always to take the handsomest shoots, and from such branches as generally produce the greatest quantity of fruit; for if you take those which are produced from the stem of the old plants (which are commonly very luxuriant) they will not be near so fruitful as those taken from bearing branches: these cuttings should be about six or eight inches long, and must be planted in a border of light earth, exposed to the morning sun, about three inches deep; in the summer, when they have put out shoots, those near the bottom should be rubbed off, leaving only the uppermost or strongest, which should be trained upright to form a regular stem. In *October* following, these plants will be fit to remove; at which time should be prepared an open spot of fresh earth, which should be well dug, and cleansed from noxious weeds, roots, &c. and being levelled, the plants should be taken up, and their roots trimmed; then plant them at three feet distance row from row, and one foot asunder in the rows. In this place they may remain one year, being careful to keep

keep them clear from all lateral shoots which are produced below the head of the plant, so that they may have clear stems about a foot in height above the surface of the earth, which will be tall enough: as the branches are generally produced very irregular, so such of them as cross each other, or where they are too close, should be cut out, whereby the head of the plant will be open, and capable of admitting the air freely into the middle, which is of great use to the fruit.

After these plants have remained in this nursery one year, they will be fit to transplant to the places where they are designed to remain; for they should not grow in the nurseries too large, because when their roots become woody, there is a hazard in removing of the plants. The soil in which these plants thrive to the greatest advantage, is a rich light earth, though they will do very well upon middling soils, which are not too strong or moist, and in most situations; but where the fruit is cultivated, to have it in the greatest perfection, they should never be planted in the shade of other trees, but must have a free open exposure. The distance they ought to be planted is eight feet row from row, and six feet asunder in the rows, where they are planted for a full crop. The best season for transplanting them is in *October*, when their leaves begin to decay; observing, as was before directed, to prune their roots, and trim off all lateral shoots, or such as cross each other, shortening all long branches, so as to make the head regular.

In pruning of these shrubs, most people make use of garden shears, observing only to cut the head round, as is practised for ever-greens, &c. whereby the branches become so much crowded, that what fruit is produced, never grows to half the size it would do, were the branches thinned, and pruned according to art; which should always be done with a pruning knife, shortening the strong shoots to about ten inches, and cutting out all those which grow irregular, thinning the fruit-bearing branches where they are too close, observing always to cut behind a leaf bud. With this management the fruit will be near twice as large as those which are produced upon such bushes as are not thus pruned, and the shrubs will continue in vigour much longer; but the ground should be dug at least once a year, and every other year a little rotten dung should be dug into the ground, which will greatly improve the fruit.

It is a common practice with the gardeners near *London*, who have great quantities of these bushes in order to supply the markets, to prune them soon after *Michaelmas*, and then to dig up the ground between the rows, and plant it with *Coleworts* for spring use, whereby their ground is employed all the winter, without prejudicing the *Gooseberries*; and in hard winters these *Coleworts* often escape, when those which are planted in an open exposure are destroyed; and these are generally pulled up for use in *February* or *March*, so that the ground is clear before the *Gooseberries* come out in the spring: it is a piece of husbandry well worth practising where ground is dear, or where persons are confined for room.

GROVES are the greatest ornaments to a garden, nor can a garden of any extent be complete which has not one or more of these. In small gardens there is scarce room to admit of groves, yet in these there should be a few trees, disposed in imitation of a grove.

These groves are not only great ornaments to gardens, but are also the greatest relief against the violent heats of the sun, affording shade to walk under, in the hottest part of the day, when the other parts of the garden are useless; so that every garden is defective which has not shade.

Groves are of two sorts, *viz.* open and close groves; open groves are such as have large shady trees, which stand at such distances, as that their branches may approach so

near each other, as to prevent the rays of the sun from penetrating through them; but as such trees are a long time in growing to a proper size for affording a shade, so where new groves are planted, the trees must be placed closer together, in order to have shade as soon as possible; but in planting of these groves, it is much the best way to dispose all the trees irregularly, which will give them a greater magnificence, and also form a shade sooner, than when the trees are planted in lines; for when the sun shines between the rows of trees, as it must do some part of the day in summer, the walks between them will be exposed to the heat, at such times, until the branches of these trees meet; whereas in the irregular plantations, the trees intervene, and obstruct the direct rays of the sun.

When a person, who is to lay out a garden, is so happy as to meet with large full grown trees upon the spot, they should remain inviolate, if possible; for it will be better to put up with many inconveniences than to destroy them; so that nothing but that of offending the habitation, by being so near as to occasion great damps or obstructing fine views, should tempt the cutting of them down.

Most of the groves which have been planted either in *England*, or in those celebrated gardens of *France*, are composed only of a few regular lines of trees; but these do not appear so grand, as those which have been made in woods, where the trees have grown accidentally, and at irregular distances; where they have large spreading heads, and are left at such distance, as to permit the grass to grow under them, then they afford the greatest pleasure: for nothing is more noble than fine spreading trees, with large stems, growing through grass, especially if the grass is well kept, and has a good verdure; besides, most of these planted groves have generally a gravel walk, made in a straight line between them, which greatly offends the sight of persons who have true taste; therefore whenever a gravel walk is absolutely necessary to be carried through these groves, it will be much better to twist it about, according as the trees naturally stand, than to attempt regularity; but dry walks under large trees are not so useful as in open places, because the dropping of the trees will render these walks useless after rain, for a considerable time.

Close groves have frequently large trees standing in them, but the ground is filled under these with shrubs, or under wood; so that the walks which are made in them are private, and screened from winds, whereby they are rendered agreeable for walking, at such times when the air is too violent or cold for walking in the more exposed parts of the garden.

These are often contrived so as to bound the open groves, and frequently to hide the walls, or other inclosures of the garden; and when they are properly laid out, with dry walks winding through them, and on the sides of these sweet-smelling shrubs and flowers irregularly planted, they have a charming effect; for here a person may walk in private, sheltered from the inclemency of cold or violent winds, and enjoy the greatest sweets of the vegetable kingdom: therefore where it can be admitted, if they are continued round the whole inclosure of the garden, there will be a much greater extent of walk; and these shrubs will appear the best boundary, where there are not fine prospects to be gained.

These close groves are by the *French* termed *Bosquets*, from the *Italian* word *Boschetto*, which signifies a little wood, and in most of the *French* gardens there are many of them planted; but these are reduced to regular figures, as ovals, triangles, squares, and stars, which have neither the beauty or use which those have that are made irregularly, and whose walks are not shut up on each side by hedges, as those in *France* generally are, which prevents the eye from

seeing the tall trees growing in the quarters; and these want the fragrantcy of the shrubs and flowers, which are the great delight of these private walks; add to this the keeping of the hedges in good order, which is attended with a great expence, which is a capital thing to be considered in the making of gardens.

GUAIABARA. See Coccolobos.

GUAJACANA. See Diospyros.

GUAJACUM. *Plum. Nov. Gen.* 39. *tab.* 17. *Lignum Vitæ*, or Pockwood.

The Characters are,

The flower hath a concave empalement. It hath five oblong, oval, concave petals, which are inserted in the empalement, and ten erect stamina inserted in the empalement. The germen, which is oval and pointed, afterward becomes a berry, which is roundish, with an oblique point and deeply furrowed, inclosing one oval hard seed.

The Species are,

1. GUAJACUM *foliolis bijugatis obtusis*. *Lin. Sp. Plant.* 381. Guajacum with obtuse lobes placed by pairs.

2. GUAJACUM *foliolis multijugatis obtusis*. *Lin. Sp. Plant.* 382. Guajacum with many pair of obtuse lobes.

3. GUAJACUM *foliolis multijugatis acutis*. *Lin. Sp. Plant.* 382. Guajacum with many pair of acute pointed leaves.

The first sort is the common *Lignum Vitæ*, or Guajacum, which is used in medicine, which grows naturally in most of the islands in the *West-Indies*, where it becomes a very large tree, having a hard, brittle, brownish bark, not very thick; the wood is firm, solid, and ponderous, very resinous, of a blackish yellow colour in the middle, and of a hot aromatick taste; the smaller branches have an Ash-coloured bark, and are garnished with leaves, divided by pairs, each pair having two pair of small, oval, blunt pinnæ, of a stiff consistence, and a lucid green; the flowers are produced in clusters at the end of the branches, composed of five oval concave petals, of a fine blue colour; in the center of these is fixed a style with an oval germen, crowned by a slender stigma; and round this is situated a great number of stamina, which are as long as the style, terminated by fickle-shaped summits. Dr. *Linnaeus* supposes the flowers to have but ten stamina, whereas they certainly have twenty, so it should be ranged in his twelfth class of plants; nor is it the empalement, but the germen which becomes the fruit.

The bark and wood of this tree are much of the same nature, only the wood is accounted hotter: they are used in diet drinks, to purify and cleanse the blood, and to cause sweating; they are esteemed good for the gout and dropsy, the king's evil, and particularly for the *French* pox. The gum or resin, which is black, shining, and brittle, and when powdered of a greenish white colour, of an aromatick smell, and poignant taste, is somewhat cathartick, and a good purge in rheumatick cases, to the quantity of two scruples mixed with the yolk of an egg, and given in a convenient vehicle.

The wood of this tree is so hard as to break the tools in felling them, so they are seldom cut down for fire-wood, being difficult to burn; but it is of great use to the sugar planters, for making of wheels and cogs for the sugar mills, &c. It is also frequently brought to *Europe*, and wrought into bows, and other utensils.

This tree can only be propagated by seeds, which must be procured from the countries where it naturally grows; these should be fresh, otherwise they will not grow; they should be sown in pots, and plunged into a good hot-bed: if the seeds are good, and the bed in which they are plunged is of a proper temperature of heat, the plants will appear in six or eight weeks after, and in six weeks or two months more will be of strength enough for transplanting;

they should be carefully taken out of the seed-pots, so as to preserve their roots as entire as possible, and each planted in a separate small pot, and plunged into a new hot-bed of tanners bark, where they must be shaded from the sun till they have taken fresh root; then they must be treated in the same manner as other tender exotick plants from warm countries, admitting a large share of free air to them when the weather is warm. While the plants are young, they may be kept during the summer season in a hot-bed of tanners bark under a frame; but in the autumn they must be removed into the bark stove, and plunged into the hot-bed of tan, where they should constantly remain, and must be treated in the same manner as other tender plants, being careful not to give them too much water in the winter: in summer they should have a large share of free air admitted to them every day. With this treatment the plants will thrive very well, but they are plants of slow growth in their own country, so cannot be expected to make great progress in *Europe*.

The second sort hath many small leaves placed along the midrib by pairs, which are rounded and obtuse at their ends, but narrow at their base: they are of the same consistence with those of the former sort, but of a darker green colour; the flowers are produced in loose bunches toward the end of the branches, which are of a fine blue colour, their petals are fringed on their edges. This is called in some of the islands bastard *Lignum Vitæ*; I received it from *Antigua* by that title. It requires the same treatment as the first sort, and is propagated by seeds in the same way.

I have also received specimens from the island of *Barbuda* of one, which seems different from either of those before-mentioned: the branches have the same appearance with those of the first sort, but the leaves are larger, indented at their extremities, and are placed all round the branches, on very short foot-stalks; the flowers were broken off, so I cannot determine the difference between them, but by all appearance they seem to be of the same genus.

The third sort has been long an inhabitant in some of the curious gardens in *England* and *Holland*, but seldom produces flowers here. This grows naturally at the *Cape of Good Hope*; however, Dr. *Linnaeus* has removed it from the *Acacia*, where it had been placed, and has added it to this genus; and as I have not yet seen the flowers, so I do not know if it is right placed. The plants retain their leaves all the year, and will live in a good green-house in winter, but in summer must be placed abroad with other green-house plants. It is of slow growth, and is with difficulty propagated by layers.

GUAJAVA. See *Psidium*.

GUANABANUS. See *Annona*.

GUAZUMA. See *Theobroma*.

GUIDONIA. See *Samyda*.

GUILANDINA. *Lin. Gen. Plant.* 464. The Nickar tree.

The Characters are,

The empalement of the flower is bell-shaped, cut at the rim into five equal parts; the flower has five concave spear-shaped petals which are equal, inserted into the empalement, and ten awl-shaped stamina inserted in the empalement. In the center is situated an oblong germen, which afterward becomes a rhomboid pod, with a convex future on the upper side, having one cell, including oval hard seeds which are separated by partitions.

The Species are,

1. GUILANDINA *aculeata, foliis bipinnatis, foliolis ovatis oppositis integerrimis*. Prickly Guilandina with doubly winged leaves, whose lobes are oval, opposite, and entire, called yellow Nickar.

2. GUILANDINA *aculeata, foliolis ovalibus oppositis sessilibus*. Prickly Guilandina with oval small leaves placed opposite, and sitting close, called grey Nickar.

3. GUILAN-

3. *GUILANDINA inermis foliis bipinnatis*. Smooth Guilandina with doubly-winged leaves.

4. *GUILANDINA inermis, foliis subpinnatis, foliolis inferioribus ternatis*. Flor. Zeyl. 155. Smooth Guilandina with winged leaves, whose under small leaves are trifoliate, called Morunga.

5. *GUILANDINA inermis foliis bipinnatis, basi apiceque simpliciter pinnatis*, Lin. Sp. Guilandina with smooth branches, doubly winged leaves; but those at the top and bottom are singly winged, called Canada Nickar tree.

The first and second sorts grow naturally in most of the islands in the *West-Indies*, where they twine their stalks about any neighbouring support, and rise to the height of twelve or fourteen feet. The leaves of the first sort are near a foot and a half long, composed of six or seven pair of pinnæ, or wings, each of which has as many pair of lobes, or small leaves set along the midrib; these are oval and entire; the foot-stalk or principal midrib of the leaf is armed with short crooked thorns, which are placed irregularly; the stalks are also closely armed with the like thorns, which are larger. The stalks at first grow erect, but as they advance twine about the neighbouring trees or shrubs, being too weak to stand without support: the flowers come out in long spikes from the wings of the stalk, composed of five concave yellow petals, which are equal; in the center is situated the oblong germen, surrounded by ten stamina. After the flower is past, the germen becomes a pod about three inches long and two broad, closely armed with slender spines, opening with two valves, each inclosing two hard seeds about the size of children's marbles, of a yellowish colour.

The second sort differs from the first, in having much smaller leaves, which are set closer together; and below each pair of lobes are situated two short, stiff, crooked spines, which are placed opposite; the flowers are of a deeper yellow colour than those of the first sort, and the seeds are of an Ash colour.

The third sort was discovered by the late Dr. *Houfston* at *Campeachy*, from whence he sent the dried samples to *England*, but there was no fruit on the trees at the time when he was there; but he mentions that this sort had an upright stem, which was of a large size, dividing into many branches, garnished with smooth double-winged leaves; the wings come out opposite, each leaf being composed of four pair, but the lobes are placed alternate upon the middle rib; they are oval, but end in a point, and are of a light green colour.

The fourth sort grows naturally in the island of *Ceylon*, and in several places on the *Malabar* coast. This in its native country rises to the height of twenty-five or thirty feet, with a strong stem, covered with a smooth bark, which in the young branches is green, but on the older it is of an Ash colour; the root grows knobbed and very thick. This, when young, is scraped and used by the inhabitants as Horse-radish in *Europe*, having much the same sharp taste; the branches are garnished with decompound winged leaves; those which are situated at the base, have but three leaves, but above the leaves are branched out into several divisions, which are again divided into smaller, which have five or six pair of oval lobes, terminated by an odd one; they are of a light green, and a little hoary on their under side. The flowers are produced in loose bunches from the side of the branches, composed of an unequal number of petals, from five to ten; they have ten short stamina surrounding the germen, which afterward turns to a long taper pod, including several angular seeds, covered with a thin membrane. These have a flavour like the root.

These four sorts are natives of warm countries, so will not live through the winter in *England*, unless they are placed

in a warm stove, and the pots plunged into the tan-bed. They are propagated by seeds, but those of the two first sorts are so hard, that unless they are soaked two or three days in water before they are put into the ground, or placed under the pots in the tan-bed to soften their covers, they will remain years in the ground without vegetating; when the plants come up they will be fit to transplant in a short time, when they should be each transplanted into a small pot, and plunged into a moderate hot-bed of tanners bark, shading them till they have taken fresh root; then they must be treated in the same manner as other tender exotic plants, giving them a large share of air in warm weather, and but little water; and when the plants have advanced to be too tall to remain in the frames, they must be removed into the bark-stove and plunged into the hot-bed, where they will make great progress, provided they have not too much water, especially during the winter season, for these plants are very impatient of moisture in cold weather.

The fourth sort requires the same treatment as those before-mentioned, but the seeds will grow without being steeped in water, and the plants are with difficulty shifted from one pot to another, for their roots are large, fleshy, and have but few fibres; so that unless great care is taken, all the earth will fall away from them, which often causes their stalks to decay almost to the root, and sometimes occasions the loss of the plants. This plant must be sparingly watered at all times, but particularly in cold weather, when moisture will cause them to rot in a short time.

The fifth sort grows naturally in *Canada*, from whence the plants were brought to *Paris*, where it has been some years cultivated, and a few years past it was brought to *England*. This in the country where it naturally grows, rises with an erect stem to the height of thirty feet or more, dividing into many branches, which are covered with a bluish Ash-coloured bark very smooth, garnished with large decompound winged leaves which are of the oval shape, very smooth and entire, but are ranged alternate on the midrib; these fall off in the autumn, and new ones come out late in the spring.

There are male and female of this sort in different plants; as these have not as yet flowered in any of the *English* gardens, so I can give no farther account of it, nor of the fruit, having never seen either of them. This sort lives abroad in the open air, and is never hurt by the frost. It is only propagated by cutting off some of the roots and planted in pots, which should be plunged into a gentle hot-bed, which will cause them to shoot upward, so may be taken from the old root and multiplied. It requires a light soil, not too moist.

GUNDELIA. Tourn. Cor. 51. tab. 486.

The Characters are,

It hath an uniform tubulous flower, composed of many hermaphrodite florets, which have but one petal slightly cut into five parts: they have five short hairy stamina. The oval germen is situated at the bottom of the flower, which afterward becomes a roundish single seed inclosed in the common receptacle, which is conical, and the seeds are separated by a chaffy down.

We have but one species of this genus at present in *England*, viz.

GUNDELIA. Lin. Sp. Plant. 814. There is no *English* title to this plant, but there are two varieties of it mentioned by *Tournefort*, which are supposed to arise from the same seeds, as they were found growing promiscuously together. These are,

1. *GUNDELIA Orientalis, acanthi aculeati foliis, floribus intense purpureis, capite araneosâ lanugine obsito*. Tourn. Cor. 51. Eastern Gundelia with prickly Bearsbreech leaves, deep purple flowers, and a head covered with a down like a cobweb.

2. *GUNDELIA Orientalis, acanthi aculeati folio, capite glabro.* Tourn. Cor. 51. Eastern Gundelia, with a prickly Bear-breech leaf, and a smooth head.

This plant was discovered by Dr. Gundelsheimer, in company with Tournesfort, near Baibout in Armenia, but has since been found growing naturally in several places in the Levant. The stalks of this plant seldom rise more than two feet high; the under leaves are long, narrow, and sawed on their edges, their teeth ending in a spine; the other leaves are broader, which are irregularly slashed to the midrib, and armed at the points with sharp prickles; the stalks divide upward into several branches, which are armed with leaves of the same form, but are narrower, and each is terminated by a conical head of flowers, resembling those of fuller's Thistle, being surrounded at the base by a circle of long narrow prickly leaves: these heads are composed of many hermaphrodite florets, which are shut up in the scales, each having a germen with five stamina surrounding it; but the seeds do not all ripen perfectly in each head, in the natural places of its growth. It has perfected seeds in Chelsea garden.

These plants are propagated by seed, which should be sown the beginning of March in a warm border of fresh earth, in the place where the plants are designed to remain; for these plants have tap roots which run very deep in the ground, so do not bear transplanting well. When the plants come up, they must be carefully cleared from weeds; and as they grow large they should be thinned, leaving the plants, which are designed to remain, about two feet asunder, that they may have room to spread. After this there is no other culture required, but to keep them clear from weeds; in two years from seeds the plants will produce their flowers, which will make a fine appearance amongst other hardy plants in the pleasure-garden: the roots will continue several years in a dry soil.

GYP SOPHYLA. Lin. Gen. Plant. 498. We have no English title for this genus.

The Characters are,

The flower hath a permanent bell-shaped empalement, cut into five parts at the top. It hath five oval blunt petals, and ten awl-shaped stamina. In the center is situated a globular germen, which after-ward becomes a globular capsule with one cell, opening with five valves, filled with small roundish seeds.

The Species are,

1. *GYP SOPHYLA foliis mucronatis recurvatis, floribus aggregatis.* Lin. Sp. Plant. 406. Gypsophyla with pointed recurved leaves, and flowers gathered in a head.

2. *GYP SOPHYLA foliis lanceolato-linearibus, obsolete triquetris lævibus obtusis secundis.* Lin. Sp. Plant. 407. Gypsophyla with narrow spear-shaped leaves, having three blunt angles, and smooth obtuse leaves in clusters.

3. *GYP SOPHYLA foliis lanceolatis lævibus, caulibus diffusis, pistillis corollâ campanulatâ longioribus.* Lin. Sp. Plant. App. 1195. Gypsophyla with smooth spear-shaped leaves,

diffused stalks, and the pointal longer than the petal, which is bell-shaped.

4. *GYP SOPHYLA foliis ovato-lanceolatis, semiamplexicaulis.* Lin. Sp. Plant. 408 Gypsophyla with oval spear-shaped leaves, half embracing the stalks.

5. *GYP SOPHYLA foliis lanceolatis scabris, corollis revolutis.* Lin. Sp. Plant. 407. Gypsophyla with rough spear-shaped leaves, and the petals of the flowers recurved.

The first sort grows naturally in the south of France, in Spain, and Italy, upon the mountains. This hath a perennial root, from which arise many narrow leaves ending in acute points, which are recurved; the stalks rise about a foot high, garnished with narrower leaves placed opposite, and at some of the joints there are smaller leaves growing from the stalks in clusters; the upper part of the stalk divides into smaller branches, each being terminated by a close bunch of small white flowers. These appear in July, and are succeeded by small oval capsules, filled with small seeds.

The second sort is somewhat like the first, but the leaves are much narrower, and almost three cornered; they are placed in clusters, which come out from the side of the stalk; the bunches of flowers are smaller, and not so closely joined. This hath a perennial root, and grows naturally upon the Helvetian mountains.

The third sort hath a perennial root; from which arise smooth spear-shaped leaves in clusters; the stalks are near a foot long, but lie prostrate upon the ground; the flowers have a purplish cast, and the stamina are much longer than the petals of the flowers. This flowers in June and July, and the seeds ripen in autumn.

The fourth sort grows naturally in the Levant, and also in Spain. It hath a strong, fleshy, fibrous root, which strikes deep in the ground, sending up several thick fleshy stalks, which rise two or three feet high, garnished with oval spear-shaped leaves, which half embrace the stalks with their base; the upper part of the stalk divides into many smaller branches, which are terminated with loose bunches of small white flowers, which make but little appearance.

The fifth sort grows naturally in Siberia and Tartary. This hath a perennial root, from which arise many branching stalks a foot and a half high, garnished with narrow smooth-pointed leaves, shaped like those of Gilliflower; at the top of the stalks are produced loose clusters of very small white flowers, which appear at the same time with the former sorts, and the seeds ripen in the autumn.

These plants have no great beauty, so are rarely cultivated but in botanick gardens, for the sake of variety.

They are propagated by seeds, which should be sown in a bed of light earth, and when the plants are fit to remove, they may be transplanted into the places where they are designed to remain, and will require no other culture but to keep them clean from weeds; for the roots will continue several years, and annually produce flowers and seeds.

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HÆMANTHUS. *Tourn. Inst. R. H. 657. tab. 433.* Blood-flower.

The Characters are,

The flower has a permanent empalement of six leaves, shaped like an umbel. It hath one erect petal, cut into six parts, and six awl shaped stamina, which are inserted in the petal. The germen is situated under the flower, which afterward becomes a roundish berry with three cells, each containing one triangular seed.

The Species are,

1. HÆMANTHUS *foliis linguiformibus planis. Prod. Leyd.*
42. Blood-flower with plain tongue-shaped leaves.
2. HÆMANTHUS *foliis longioribus carinatis,* Blood-flower with longer keel-shaped leaves.
3. HÆMANTHUS *foliis lanceolatis undulatis. Hort Cliff.*
127. Blood-flower with spear-shaped waved leaves.

The first sort has been many years in several curious gardens in *Europe*. This hath a large bulbous root, from which in the autumn comes out two broad flat leaves, of a fleshy consistence, shaped like a tongue, which turn backward on each side, and spread flat on the ground, so have a singular appearance all the winter; in the spring these decay, so that from *May* to the beginning of *August*, they are destitute of leaves: this produces its flowers always in the autumn, just before the new leaves come out. The stalk rises a foot or more in height, supporting a cluster of bright red tubulous flowers, inclosed in a common leafy empalement; with one petal cut into six parts, each having six long stamina, standing out beyond the petal, and in the center appears the germen sitting under the flower, supporting a single style, crowned with a stigma. The germen never ripens to a seed in *England*, but decays with the flower, and then the green leaves grow and spread on the ground.

The second sort hath a large bulbous root like the first, which sends out three or four leaves, which grow a foot long or more; these are not flat like those of the other, but are hollowed like the keel of a boat, and stand more erect than those of the former sort, but are not quite so broad; the flowers of this are like those of the first, but the stalk is taller, and they are of a paler red; this is certainly a different species from the other, and their differences are permanent.

The third sort hath roots composed of many thick fleshy tubers, which join at the top, where they form a head, out of which arises a fleshy spotted stalk, like that of the *Dragon*, which spreads out at the top into several spear-shaped leaves, waved on their edges. The stalks grow about a foot high; the leaves are six or eight inches long, and two broad in the middle; from the side of the stalk near the ground, breaks out a strong fleshy foot-stalk, about six or eight inches long, sustaining at the top a large cluster of flowers, included in one common empalement or covering, which is permanent; the flowers are shaped like those of the other sorts, but are of a yellowish red colour. These appear in *May*, *June*, or *July*, and are succeeded by berries which are of a beautiful red colour when ripe.

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The two first sorts do not propagate very fast in *Europe*; their roots seldom putting out many offsets; the gardens in *Holland* have been supplied with roots from the *Cape of Good Hope*, where they naturally grow, and produce seeds; they are too tender to thrive in this country in winter, if planted in the full ground, and exposed to the open air, therefore the roots are generally planted in pots, and, in winter, placed in a green-house, where by their large leaves spreading upon the pots, they make a pretty appearance, but with this treatment the roots seldom flower here: the only way to have the flowers in perfection, is to prepare a bed of good earth in a bricked pit, where they may be covered with glasses, and in hard frosts with mats and straw; the earth in the bed should be two feet deep, and the frame should rise two feet higher, to allow height for the flower-stems to grow. The roots should be planted nine or ten inches asunder, and in winter, if they are protected from frost, and not suffered to have too much wet, but in mild weather exposed to the open air, the roots will flower every year, and the flowers will be much stronger than with any other management.

The third sort is a native of the *Cape of Good Hope*; this may be propagated by parting of the roots, in the spring, before the plants put out new stalks, which is also a right time to shift and new pot them; but as the roots do not multiply very fast in offsets, so the best way is to propagate them from seeds, which they ripen plentifully in *England*; these should be sown soon after they are ripe, in pots, and kept in the stove all the winter; if these pots are plunged into the tan-bed in the bark-stove, in the vacancies between the plants, the seeds will be sooner prepared to vegetate in the spring, when the pots may be taken out of the stove, and plunged into a moderate hot-bed, which will bring up the plants in a little time; soon after they are up, they must have air admitted to them every day in mild weather, to prevent their drawing up weak; and when they are fit to remove, they may be each planted in a separate small pot filled with light earth, and plunged into the hot-bed again, to promote their taking new root; then they must be gradually hardened, and afterward may be removed into the dry stove, where they should constantly remain, otherwise the plants will not thrive and flower in this country. In the winter season they must not have too much wet, for as their roots are fleshy and succulent, so they are apt to rot with moisture. In the summer they must have a large share of air in warm weather, and require to be frequently watered, especially during the time of their flowering.

HÆMATOXYLUM. *Lin. Gen. Plant. 417.* Blood-wood, Logwood, or *Campeachy Wood*.

The Characters are,

The flower hath a permanent empalement, cut into five oval segments. It hath five oval petals; and ten awl-shaped stamina, which are longer than the petals. In the center is situated an oblong oval germen, which afterward becomes a compressed obtuse capsule, with one cell, opening with two valves, containing two or three oblong, flat, kidney-shaped seeds.

We have but one *Species* of this genus, *viz.*

HÆMATOXYLUM. *Hort. Cliff.* 160. Logwood or Campeachy Wood.

This tree grows naturally in the bay of *Campeachy*, at *Honduras*, and other parts of the *Spanish West-Indies*, where it rises from sixteen to twenty-four feet high. The stems are generally crooked, and very deformed, they are seldom thicker than a man's thigh. The branches which come out on every side, are crooked, irregular, and armed with strong thorns, garnished with winged leaves, composed of three or four pair of obtuse lobes, indented at the top. The flowers come in a racemus from the wings of the leaves, standing erect; they are of a pale yellowish colour, with a purple empalement, and are succeeded by flat oblong pods, each containing two or three kidney-shaped seeds.

The wood of this tree is brought to *Europe*, where it is used for dying purples, and for the finest blacks, so is a valuable commodity; but the *Spaniards*, who claim a right to the possession of those places where it naturally grows, are for excluding all other countries from cutting of the wood, which has occasioned many disputes with their neighbours, but particularly with the *English*; this it is to be hoped will soon be over, as there are some of the planters in *Jamaica*, and the other islands in *America*, belonging to the crown of *Great-Britain*, who have propagated this tree in so great plenty, as to have hopes of supplying the demand for this wood in *Britain* in a very few years; for the trees grow so fast there, as to be fit for use in ten or twelve years from seed; and as they produce great plenty of seeds in the *British* colonies, so those seeds scattering about, the plants come up in all the neighbouring lands, therefore will soon be like an indigenous plant of the country.

This plant is preserved in some curious gardens in *England*, for the sake of variety. The seeds are frequently brought from *America*, which, if fresh, readily grow when sown upon a good hot-bed; and if the plants are kept in a moderate hot-bed, they will grow to be upward of a foot high the same year; and, while the plants are young, they are generally well furnished with leaves, but afterward they make but little progress, and are frequently but thinly clothed with leaves. The plants are very tender, so should be constantly kept in the bark-stove, where, if they are duly watered, and the stove kept in a good degree of heat, the plants may be preserved very well. There are some of these plants now in *England*, which are upward of six feet high, and as thriving as those in their native soil.

HALICACABUM. See *Physalis*.

HALICACABUS PEREGRINA. See *Cardiospermum*.

HALIMUS. See *Atriplex*.

HALLERIA. *Lin. Gen. Plant.* 679. African Fly Honey-suckle.

The Characters are,

The flower hath a permanent empalement of one leaf. It hath one petal of the grining kind, whose chaps are swollen and inflexed. It hath four stamina, which are bristly, two being longer than the other. In the bottom of the tube is situated an oval germen, which afterward becomes a roundish berry with two cells, each containing one hard seed.

We have but one *Species* of this genus, *viz.*

HALLERIA. *Hort. Cliff.* 323. This plant has its title from *Dr. Haller*, who was professor of botany at *Gottingen* in *Germany*. African Fly Honey-suckle.

The *English* name which I have here added, has been given to this plant by some gardeners, who observed that the shape of the flower had some resemblance to that of the Upright, or Fly Honey-suckle, and, for want of an *English* name, gave this to it.

This plant grows to the height of six or eight feet, with a woody stem, which is well furnished with branches, gar-

nished with oval sawed leaves, placed opposite, which continue green through the year; the flowers come out singly, and are of a red colour, but, being intermixed with the leaves, are not seen unless they are looked after, for they grow scatteringly on the branches; these come out in *June*, and the seeds ripen in *September*: the plants make a variety in the green-house during the winter season.

It may be propagated by cuttings, which, if planted in pots in the spring, and plunged into a gentle hot-bed, will soon take root; these plants must be exposed in summer, and will require plenty of water in that season; in the winter they must be housed with *Myrtles*, and other hardy exotick plants, which require a large share of air in mild weather.

HAMAMELIS. *Lin. Gen. Plant.* 155. The Witch Hazel.

The Characters are,

It is male and female in different plants; the male flowers have a four-leaved empalement, four narrow petals, which are reflexed, and four narrow stamina, which are shorter than the petals. The female flowers have a four-leaved involucre, in which are four flowers, with a four-leaved coloured empalement; they have four narrow petals, and four nectariums adhering to the petals. In the center is situated an oval hairy germen, which afterward becomes an oval capsule, sitting in the involucre, having two cells, each containing one hard, oblong, smooth seed.

We have but one *Species* of this genus in the *English* gardens at present, *viz.*

HAMAMELIS. *Flor. Virg.* 129. The Witch Hazel.

This plant grows naturally in *North America*, from whence the seeds have been brought to *Europe*, and many of the plants have been raised in the *English* gardens, where they are propagated for sale by the nursery gardeners. It hath a woody stem, from two to tree feet high, sending out many slender branches, garnished with oval leaves, indented on their edges, having great resemblance to those of the Hazel; these fall away in autumn, and when the plants are destitute of leaves, the flowers come out in clusters from the joints of the branches; these sometimes appear the latter end of *October*, and often not till *December*, but are not succeeded by seeds in this country.

As the flowers of this shrub make very little appearance, so it is only preserved in the gardens of the curious, more for the sake of variety than its beauty.

It is propagated by laying down the young branches in autumn, which will take root in one year, and may then be taken from the old plants, and planted where they are to remain. The seeds of this plant always remain a whole year in the ground, so they should be sown in pots, which may be plunged into the ground in a shady part of the garden, where they may remain all the summer, and will require no other care but to keep the pots clean from weeds, and in very dry weather to water them now and then; in autumn the pots may be removed to a warmer situation, and plunged into the ground under a warm hedge, and if the winter should prove very severe, they should have some light covering thrown over them, which will secure the seeds from being destroyed. In the spring the plants will come up, and as the season advances, the pots may be removed where they may have the morning sun till eleven o'clock. In the autumn they should be transplanted, either into small pots, or in a nursery-bed, where in one, or at most two years time, they will be strong enough to plant where they are designed to remain; they love a moist soil, and a shady situation.

HARMALA. See *Peganum*.

HAWTHORN. See *Mespilus*.

HAZEL. See *Corylus*.

HEDERA. *Lin. Gen. Plant.* 249. The Ivy tree.

The Characters are,

The flowers are disposed in form of an umbel. The empalement is cut into five parts, and sits upon the germen. The flower hath five oblong petals, and five awl-shaped stamina. The germen, which is situated below the flower, afterward becomes a globular berry with one cell, inclosing four or five large seeds, convex on one side, and angular on the other.

The Species are,

1. *HEDERA foliis ovatis lobatisque.* Flor. Lapp. 91. Ivy with oval and lobed leaves; common Ivy.

2. *HEDERA foliis quinatis, ovatis, serratis.* Hert. Cliff. 74. Ivy with leaves composed of five lobes, which are sawed; commonly called *Virginia Creeper*.

The first sort grows naturally in most parts of *England*, and where it meets with any neighbouring support, the stalks will fasten to it, and rise to a very great height, sending out roots on every side, which get into the joints of walls, or the bark of trees, and thereby are supported; or if there is no support near, the stalks trail upon the ground, and take root all their length, so that they closely cover the surface, and are difficult to eradicate, for where any small parts of the stalks are left, they will soon spread and multiply. While these are fixed to any support, or trail upon the ground, their stalks are slender and flexible; but when they have reached to the top of their support, they shorten and become woody, forming themselves into large bushy heads, and their leaves are larger, more of an oval shape, and not divided into lobes like the lower leaves, so that it hath a different appearance, which has occasioned some to take them for distinct species.

There are two varieties of this, one with silver-striped leaves, and the other with yellowish leaves on the top of the branches; these are preserved in some gardens for the sake of variety.

The plants are easily propagated by their trailing branches, which send forth roots their whole length; which branches, being cut off and planted, will grow in almost any soil or situation, and may be trained up to stems, or suffered to remain climbers, to cover walls, pales, &c.

They may also be propagated by seeds, which should be sown soon after they are ripe, which is in the beginning of *April*; if these are kept moist and shaded, they will grow the same spring, otherwise they will remain a year in the ground, therefore few persons trouble themselves to propagate the plants in this way, the other being much more expeditious.

While the stalks of this plant trail, either on the ground, or upon walls, or other support, they seldom produce flowers, which has occasioned its being called sterile, or barren Ivy; but when the branches get above their support, or grow from it, they produce flowers at the end of every shoot; these appear in *September*, and are succeeded by berries, which turn black before they are ripe, and are formed into round bunches, which are called *corymbi*, and from these the epithet of *corymbus*, so frequently used by botanists, is taken.

There is another species of Ivy, which grows naturally about *Constantinople*, and other parts of the *Levant*, with yellow berries, titled *Hedera Poetica*, by *Caspar Baubin*; but as I have not seen this plant, I cannot give a farther account of it. Dr. *Linnaeus* supposes it to be only a variety, though he has not seen the plant; but *Tournefort*, who gathered it in the *Levant*, puts it down as a different sort.

The second sort grows naturally in all the northern parts of *America*; it was first brought to *Europe* from *Canada*, and has been long cultivated in the *English* gardens, chiefly to plant against walls, or buildings to cover them, which these plants will do in a short time, for they will shoot almost twenty feet in one year, and will mount up to

the top of the highest building; but as the leaves fall off in autumn, the plants make but an indifferent appearance in winter, and as it is late before they come out in the spring, they are not much esteemed, unless it is for such situations, where better things will not thrive; for this plant will thrive in the midst of *London*, and is not injured by smoke, or the closeness of the air, so is very proper for such situations. The stalks of the plants put out roots, which fasten themselves into the joints of the walls, whereby they are supported.

It may be propagated by cuttings, which, if planted in autumn on a shady border, will take root, and by the following autumn will be fit to plant where they are designed to remain.

HEDERA TERRESTRIS. See *Glechoma*.

HEDGES. Hedges are either planted to make fences round inclosures, or to part off and divide the several parts of a garden; when they are designed as outward fences, they are planted either with Hawthorn, Crabs, or Black Thorn, which is the Sloe; but those hedges which are planted in gardens, either to surround wilderness quarters, or to screen the other parts of a garden from sight, are planted with various sorts of plants, according to the fancy of the owner, some preferring ever-green hedges, in which case the Holly is best, next the Yew, then Laurel, Laurustinus, Phillyrea, &c. Others, who make choice of the deciduous plants, prefer the Beech and Hornbeam, *English Elm*, or the Alder, to any other; I shall first treat of those hedges which are planted for outside fences, and afterward briefly touch on the other.

These hedges are most commonly made of Quick, yet it will be proper, before planting, to consider the nature of the land, and what sort of plants will thrive best in that soil, whether it be clay, gravel, sand, &c. As for the size, the sets ought to be about the bigness of a goose quill, and cut within about four or five inches of the ground; they should be fresh taken up, frait, smooth, and well rooted. Those plants which are raised in the nursery are to be preferred to all others, and if raised on a spot near the place, it will be best.

Secondly, If the hedge has a ditch, it should be made six feet wide at top, and one foot and a half at bottom, and three feet deep, that each side may have a proper slope; for when the banks are made too upright, they are very subject to fall down after every frost, or hard rain; besides, if the ditches are made narrower, they are soon choked up in autumn by the falling leaves, and the growth of weeds, nor are they a sufficient fence to the hedge against cattle, where they are narrower.

Thirdly, If the bank be without a ditch, the sets should be set in two rows, almost perpendicular, at the distance of a foot from each other, in the quincunx order, so that in effect they will be but six inches asunder.

The usual method of planting Quick hedges, is to lay the plants sloping on the side of the bank, in two rows, one above the other, which is by no means right; for the wet cannot get to the roots of the Quick, when they are planted in such position, for the slope of the bank throws it off; therefore I recommend it as the best method to plant the sets upright upon the top of the bank where they will be farther from the reach of cattle; and if they are duly cleared from weeds, they will grow as much in one year, as those which are laid on the side of the bank will do in three. But if there are not two ditches, one on each side the bank to fence against cattle, there should be a dead hedge made within for that purpose; otherwise, where cattle are admitted into the field, they will browse upon the young shoots of the Quick, and spoil the hedge.

In making of these dead hedges, there should be stakes driven in to the earth, at about two feet and a half distance, so low as to reach the firm ground.

Oak stakes are the best, and Black Thorn the next; then for the small bushes be laid at bottom, but not too thick, for that will cause the bushes to rot, but the upper part of the hedge should be laid with long bushes to bind the stakes in with, by interweaving them.

And, in order to render the hedge yet stronger, you may edder it (as it is called,) *i. e.* bind the top of the stakes in with some small poles on each side, and when the eddering is finished, drive the stakes anew, because the waving of the hedge and eddering is apt to loosen the stakes.

When a hedge is of about eight or nine years growth, it will be proper to plash it; the best time for this work is either in *October* or *February*.

In plashing Quicks, there are two extremes to be avoided; the first is, laying it too low, and too thick; because it makes the sap run all into the shoots, and leaves the plashes without nourishment, which, with the thickness of the hedge, kills them.

Secondly, It must not be laid too high, because this draws all the sap into the plashes, and so causes but small shoots at the bottom, and makes the hedge so thin, that it will neither hinder the cattle from going through, nor from cropping of it.

If the stems are very old, cut them quite down, and secure them with good dead hedges on both sides, till the young shoots are got up tall enough to plash, and plant new sets in the void spaces.

If you would have a good hedge, or fence, you should new lay it once in fourteen or fifteen years, and constantly root out Elder, Travellers Joy (which some call Bull-bine), Bryony, &c. and do not leave high standards, or pollards in it, nor any dead wood is to be left in the bottom of the hedges, for that will choke the Quick; but if there be a gap, the dead hedge should be made at a distance.

The Crab is also frequently planted for hedges, and if the plants are raised from the kernels of the small wild Crab, they are much to be preferred to those which are raised from the kernels of all sorts of Apples without distinction, because the plants of the true small Crab never shoot so strong as those of the Apples, so may be better kept within the proper compass of a hedge; and as they have generally more thorns upon them, they are better guarded against cattle, &c. than the other; besides, the plants of the Crab will grow more equal than those which are raised from the kernels of various kinds of Apples, for these always produce a variety of plants, which differ from each other in their manner of growth, as much as in the size and flavour of their fruits, so that hedges made of these will not appear so neat, nor can be so well managed as the other.

The Black Thorn, or Sloe, is also frequently planted for hedges, and is a strong durable plant for that purpose, especially as it is so strongly armed with thorns, that cattle seldom care to brouze upon it; but where this is planted, the best way is to raise the plants from the stones of the fruit; for all those which are taken from the roots of old trees, spawn, and put out suckers in such plenty from their roots, as to spread over, and fill the neighbouring ground to a considerable distance on each side of the hedge; and this plenty of suckers drawing away the nourishment from the old plants of the hedge, they never grow so well as where there are few or no suckers produced, which those plants which are propagated from the stones send not forth, or at least but sparingly,

therefore may with little trouble be kept clear of them. The best method of raising these hedges is, to sow the stones in the place where the hedge is intended (where it can be conveniently done), for then the plants will make a much greater progress than those which are transplanted; but the objection to this method will arise from the difficulty of securing the young plants from the cattle; but this can have little force, when it must be considered, that if the hedge is planted, it must be fenced for some years, to prevent the cattle from destroying it; therefore the same fence will do for it when sown, nor will this require a fence much longer than the other. For the plants which stand unremoved, will make a better fence in seven years, than that which is planted, tho' the plants should be of three or four years growth when planted. The stones of this fruit should be sown early in *January*, if the weather will permit, but when they are kept out of the ground longer, it will be proper to mix them with sand, and keep them in a cool place. The bushes of the Black Thorn are by much the best of any, for making of dead hedges, being of longer duration, and having many thorns, neither the cattle nor the hedge-breakers, will care to meddle with them; these bushes are also the best to be used for under ground drains, for the draining of land, for they will remain sound a long time, when the air is excluded from them.

The Holly is sometimes planted for hedges, and is a very durable strong fence, but where it is exposed, there will be great difficulty to prevent its being destroyed, otherwise it is by far the most beautiful plant; and being an ever-green, will afford much better shelter to cattle in winter, than any other sort of hedge, and the leaves being armed with thorns, the cattle will not care to brouze upon it. Another objection to this plant is the slow growth, so that hedges planted with this plant, require to be fenced a much longer time than most others. This is a reason which must be admitted; but in such grounds as lie contiguous to, or in sight of gentlemen's houses, these sort of hedges will have an exceeding good effect, especially when they are well kept, as they will appear beautiful at all seasons of the year; and in the spring of the year, when the sharp winds render it unpleasant to walk abroad in exposed places, these hedges will afford good shelter, and will appear beautiful at all seasons of the year; they will also effectually keep off the cold winds, if they are kept close and thick. The surest method of raising these hedges is, by sowing the berries in the place where they are to stand; but these berries should be buried in the ground one year before they are sown, by which method they will be prepared to grow the following spring. The way of doing this is, to gather the berries about *Christmas* (which is the time they are usually ripe), and put them into larger flower-pots, mixing some sand with them; then dig holes in the ground, into which the pots must be sunk, covering them over with earth about a foot thick; in this place they may remain till the following *October*, when they should be taken up, and sown in the place where the hedge is intended. The ground for this hedge should be well trenched, and cleared from the roots of all bad weeds, bushes, trees, &c. Then two drills should be made at about a foot distance from each other, and about two inches deep, into which the seeds should be scattered pretty close, lest some should fail: for it is better to have too many plants come up, than to want. The reason of my advising two drills is, that the hedge may be thick to the bottom, which in a single row rarely happens, especially if there is not great care taken of them in the beginning. When the plants come up, they must be carefully weeded, for if the weeds are permitted to grow among them, they will

will soon destroy them, or weaken them so much, that they will not recover their strength in a long time.

When these Holly hedges are designed to be kept very neat, they should be sheared twice a year, in *May* and *August*; but if they are only designed as fences, they need not be sheared oftener than once a year, which should be about the latter end of *June*, or the beginning of *July*; and if this is well performed, the hedges may be kept very beautiful.

When a hedge of Holly is intended to be made by plants, the ground should be well trenched, as was before advised for the seeds, and (unless the ground be very wet) the plants should be set in *October*, but in wet ground *March* is preferable. The plants should not be taken from a better soil than that in which they are to be planted; for when it so happens, they are much longer before they recover this change than those are which are taken from a leaner soil. If the plants have been before removed two or three times, they will have better roots, and will be in less danger of miscarrying, because they may be removed with balls of earth to their roots. When the frost comes on, if some mulch be laid upon the ground near the roots of the plants, it will prevent the tender fibres, which may then have been put out, from being destroyed by the cold. I would never advise the planting of hedges with Holly plants, of above four or five years growth from the berries; for when the plants are older, if they take to grow, they seldom make so close a fence at the bottom as young ones; and if the plants have been twice before transplanted, they will more certainly grow.

In the old method of laying out gardens it was a general practice to surround the wilderness quarters and other parts of the garden with hedges of ever-green, or deciduous trees, which were then esteemed ornamental; but since a better taste has been introduced, these have rarely been admitted. For if the expence of-keeping hedges in good order, together with the litter occasioned whenever they are sheared be considered, it will be found to greatly exceed any pleasure arising from them; therefore as these are not likely to take place again in the *English* gardens, it is needless to give farther directions for planting and the after-management of them, especially as the instructions here given for the raising of Holly hedges may, with a little variation, serve for any other sort.

HEDYPNOIS. See *Hyoseris*.

HEDYSARUM. *Lin. Gen. Plant.* 793. French Honey-suckle.

The Characters are,

The flower hath a permanent empalement of one leaf. It is of the butterfly kind; the wings are oblong and narrow; the keel is compressed, and convex at the base. It hath nine stamina joined, and one standing separate. In the center is situated a long narrow germen, which afterward becomes a jointed compressed pod, each joint being roundish, and incloses a single kidney-shaped seed.

The Species are,

1. HEDYSARUM foliis pinnatis, leguminibus articulatis aculeatis, nudis, rectis, caule diffuso. *Hort. Cliff.* 365. French Honey-suckle with winged leaves, naked, prickly, jointed pods, and a diffused stalk.

2. HEDYSARUM foliis pinnatis, leguminibus articulatis, aculeatis, tomentosis, caule diffuso. *Hort. Upsal.* 231. French Honey-suckle with winged leaves, jointed, prickly, woolly pods, and a diffused stalk.

3. HEDYSARUM foliis simplicibus ternatisque, floribus racemosis. *Hort. Cliff.* 232. French Honey-suckle with single and trifoliate leaves, and flowers in bunches, called French Honey-suckle of *Canada*.

4. HEDYSARUM foliis pinnatis, leguminibus articulatis, acu-

leatis, flexuosis, caule diffuso. *Lin. Sp. Plant.* 750. French Honey-suckle with winged leaves, jointed prickly pods which are waved, and a diffused stalk.

5. HEDYSARUM foliis binatis petiolatis, floralibus sessilibus. *Flor. Zeyl.* 291. French Honey-suckle with two leaves upon a foot-stalk, and those upon the flower-stalks sitting close.

6. HEDYSARUM foliis ternatis, foliolis obovatis, floribus paniculatis terminalibus, leguminibus intortis. French Honey-suckle with trifoliate oval leaves, flowers growing in panicles at the ends of the stalks, and intorted pods.

7. HEDYSARUM foliis ternatis subtus nervosis, caule glabro frutesco decumbente floribus spicatis terminalibus. Three-leaved French Honey-suckle, with veins on their under side, a smooth shrubby declining stalk, with flowers growing in spikes at the ends.

8. HEDYSARUM foliis ternatis, foliolis ovatis subtus sericeis, floribus spicatis alaribus terminalibusque. Three-leaved French Honey-suckle, with oval leaves, fatteny on their under side, and flowers in spikes from the side and at the end of the stalks.

9. HEDYSARUM foliis ternatis, caulibus diffusis villosis, floribus spicatis terminalibus, calycibus villosissimis. Three-leaved French Honey-suckle, with diffused stalks which are hairy, flowers growing in spikes at the ends of the branches, and very hairy empalements.

10. HEDYSARUM foliis ternatis, caulibus procumbentibus racemosis, floribus laxè spicatis terminalibus, leguminibus contortis. Three-leaved French Honey-suckle, with branching trailing stalks, flowers growing in loose spikes at the ends of the branches, and twisted pods.

11. HEDYSARUM foliis ternatis, foliolis obcordatis, caule erecto triangulo villoso, racemis terminalibus, leguminibus articulatis incurvis. French Honey-suckle with trifoliate leaves, whose lobes are heart-shaped, a triangular, upright, hairy stalk, flowers growing in long bunches at the ends of the branches, and jointed incurved pods.

12. HEDYSARUM foliis ternatis obcordatis, caule paniculato, leguminibus monospermis glabris. French Honey-suckle with trifoliate heart-shaped leaves, a paniculated stalk, and smooth pods containing one seed.

13. HEDYSARUM foliis ternatis, foliolis obversè-ovatis, caule volubili, spicâ longissimâ reflexâ. Three-leaved French Honey-suckle with obverse oval lobes, a twining stalk, and a very long reflexed spike of flowers.

14. HEDYSARUM foliis ternatis obcordatis, caulibus procumbentibus villosis, pedunculis unifloris. Three-leaved French Honey-suckle with oval heart-shaped leaves, trailing hairy stalks, and foot-stalks with a single flower.

15. HEDYSARUM foliis simplicibus ovatis obtusis. *Hort. Cliff.* 449. French Honey-suckle with oval, obtuse, single leaves.

16. HEDYSARUM foliis ternatis ovato-lanceolatis, subtus villosis, caule frutescente villoso. Trifoliate French Honey-suckle, with oval spear-shaped leaves, hairy on their under side, and a shrubby hairy stalk.

17. HEDYSARUM foliis ternatis, foliolo intermedio longiore, racemis alaribus erectis longissimis. French Honey-suckle with trifoliate leaves, the middle lobe standing on a longer foot-stalk, and very long bunches of flowers coming from the sides of the stalks.

18. HEDYSARUM foliis simplicibus lanceolatis obtusis, caule fruticoso spinoso. *Lin. Sp. Plant.* 745. French Honey-suckle with single, spear-shaped, obtuse leaves, and a prickly shrubby stalk, or the *Alhagi* of the *Moors*.

19. HEDYSARUM foliis simplicibus, cordato-oblongis integerrimis glabris. French Honey-suckle with single, oblong, heart-shaped leaves, which are smooth and entire.

The first sort has been long cultivated in the *English* gardens for ornament. It grows naturally in *Italy*; there are

two varieties of this, one with a bright red, and the other a white flower, which very rarely vary from one to the other; but as there is no other difference but in the colour of their flowers, so they are allowed to be the same species.

It is a biennial plant, which decays after the seeds are ripe. This sends up several hollow smooth stalks, which branch out, and rise from two to three feet high, garnished with winged leaves, composed of five or six pair of oval lobes, terminated by an odd one; from their base comes out foot-stalks, which are five or six inches long, sustaining spikes of beautiful red flowers, which are succeeded by compressed prickly-jointed pods; in each of the joints is lodged one kidney-shaped seed. This sort flowers in *June* and *July*, and the seeds ripen in *September*. The white is only a variety of this, and as such is sometimes preserved in gardens,

They are propagated by sowing their seeds in *April*, in a bed of light fresh earth; and when the plants are large enough to remove, they should be transplanted into other beds in an open situation, at about six or eight inches distance from each other, leaving a path between every four rows, to go between them to hoe, and clear them from weeds. In these beds they may remain until *Michaelmas*, when they may be transplanted into the large borders of a parterre or pleasure-garden, allowing them at least three feet distance from other plants, amongst which they should be interspersed, to continue the succession of flowers; where they will make a fine appearance when blown, especially the red sort, which produces very beautiful flowers.

As these plants decay after they have perfected their seeds, so there should annually be a fresh supply of plants raised. They are very proper ornaments for large borders, or to fill up vacancies among shrubs, but they grow too large for small borders.

The second sort is an annual plant, which grows naturally in *Spain* and *Portugal*. The leaves of this are narrow and oblong, four or five pair being placed along the mid-rib, with an odd one at the end; the stalks are terminated by small spikes of purple flowers, which are succeeded by small rough pods, shaped like those of the former sort. This plant is preserved in botanick gardens for the sake of variety; it is propagated by seeds, which should be sown the beginning of *April*, in the place where the plants are to remain, and will require no other culture but to thin them where they are too near, and keep them clean from weeds.

The third sort hath a perennial root, which will abide many years, if planted in a dry soil. This is propagated by sowing the seeds in the manner directed for the former; but when the plants are come up two inches high, they should be transplanted where they are to remain for good; but if they are not too thick in the seed-bed, they may be suffered to remain there until the following autumn; at which time they should be carefully taken up, and transplanted into the borders where they are designed to stand; for their roots generally run down very deep, so that it is not safe to remove them after they are large.

The fourth sort is an annual plant, which grows naturally in the *Levant*. This hath some resemblance of the first, but is much smaller; the stalks rise near a foot high, garnished with winged leaves, composed of two or three pair of oval lobes, terminated by an odd one; the flowers come out in spikes at the top of the stalks, which are of a pale red, intermixed with a little blue. This is propagated in the same way as the second sort, and is equally hardy.

The fifth sort grows naturally in both *Indies*. This is an annual plant, with a long tap-root, which runs deep in the ground, sending out one or two stalks, which rise about

nine inches high, the lower part being garnished with oval leaves by pairs on each foot-stalk, but the upper part of the stalk, where the flowers come out, is garnished with small leaves, ending in acute points, sitting close to the stalks; at each of these is situated a single, small, yellow flower, inclosed by the two leaves, and are succeeded by oblong pods, containing one kidney-shaped seed.

The sixth sort grows naturally at *La Vera Cruz*, and also in *Jamaica*. It is an annual plant, which rises with a shrubby stalk upward of four feet high, dividing into several branches, garnished with oblong, oval, trefoil leaves, standing upon pretty long foot-stalks, the middle lobe standing an inch beyond the other two; the branches are terminated by long loose panicles of purple flowers, which are succeeded by narrow, jointed, twisted pods. This flowers in *July*, and the seeds ripen in the autumn.

The two last mentioned are tender plants, so their seeds must be sown in the spring upon a hot-bed; and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a hot-bed, shading them from the sun till they have taken new root; then they must be treated in the same way as other tender plants from hot countries, always keeping them in the stove or glass-case, otherwise they will not flower or produce seeds in *England*.

The seventh sort grows naturally in *Jamaica*. This is a shrubby plant, which rises about five feet high, and divides into several branches, garnished with trifoliate leaves which are oval, the middle lobe being much larger than the other two; the stalks are terminated by long spikes of small purple flowers, which are succeeded by narrow pods, frait on one side, but jointed on the other.

The eighth sort grows at *La Vera Cruz*. This rises with a shrubby stalk six or seven feet high, dividing into several branches, garnished with trifoliate oval leaves, silky and white on their under side, but of a pale green on their upper; the flowers come out in long narrow spikes from the wings, and at the end of the branches, sitting close to the stalks; they are small, of a bright purple colour, and are succeeded by flat, smooth, jointed pods, about one inch long, each joint having one kidney-shaped seed.

The two last sorts will continue two or three years, if the plants are placed in the bark-stove. They are propagated by seeds, which must be sown upon a hot-bed, and the plants treated in the same manner as those just before-mentioned.

The ninth sort is an annual plant, which grows naturally at *La Vera Cruz*. This seldom rises more than eight or nine inches high, sending out several branches from the root, which are diffused and hairy, closely garnished with small, oval, trifoliate leaves, a little hoary. The flowers grow in close short spikes; they are purple, and have very hairy empalements.

The tenth sort grows naturally in *Jamaica*. This hath ligneous trailing stalks a foot and a half long, sending out several branches on each side, garnished with small, round, trifoliate leaves, of a pale green colour; the flowers are produced in very loose spikes at the end of the branches; they are of a pale purplish colour, and are succeeded by narrow twisted pods, which are jointed, containing a single, small, compressed seed.

The two last sorts being annual, require the same treatment as the fifth and sixth sorts before-mentioned, with which they will flower and ripen their seeds in this country.

The eleventh sort grows in *Jamaica*. It is a shrubby plant, which rises with triangular stalks five or six feet high, dividing into several branches, garnished with heart-shaped trifoliate leaves, ending in acute points; the flowers are produced in very long spikes at the end of the branches, which

which are of a pale purple colour, and are succeeded by narrow jointed pods, which are variously twisted; the seeds are small and compressed.

The twelfth sort is annual, it grows at *Campeachy*. This hath a paniculated stalk, which rises about two feet high, garnished with heart-shaped trifoliate leaves; the upper part of the stalk branches out into panicles of flowers, which are of a pale purple colour, and are succeeded by lunulated compressed pods, standing oblique to the stalk, each containing one compressed kidney-shaped seed. This sort is propagated by seeds, and requires the same treatment as the fifth and sixth sorts.

The thirteenth sort grows at *La Vera Cruz*. This hath a twining stalk, which twists round the trees and shrubs which grows near it, and climbs to the height of ten or twelve feet, garnished with obverse, oval, trifoliate leaves, standing upon pretty long foot-stalks; the flowers are produced in very long spikes, which are reflexed; they are of a dark purple colour, and sit close to the stalk. This is an abiding plant, which requires a stove to preserve it in this country, so the plants should be treated in the same manner as the seventh and eighth sorts.

The fourteenth sort is an annual plant, which grows naturally in both *Indies*. It hath trailing branches near a foot long, garnished with round trifoliate leaves, a little indented at the top, very like in shape to those of the Strawberry Trefoil; the stalks and under side of the leaves are hairy; the flowers are produced toward the end of the branches, sometimes single, and at other times two at a joint: they are of a purple colour and small; these are succeeded by pods about an inch long, which are strait on one side, and jointed on the other.

The fifteenth sort is a low annual plant, having slender stalks near a foot long, their lower part being garnished with single oval leaves, standing upon slender foot-stalks; their upper is adorned with flowers, which come out by pairs above each other, to the end of the stalk; they are but small, and of a reddish yellow colour, and are succeeded by jointed, narrow, sickle-shaped pods, which sit close to the stalk. The two last mentioned are annual plants, which require the same culture as the fifth and sixth sorts.

The sixteenth sort grows in *South Carolina*. This hath a perennial root, from which arise two or three shrubby hairy stalks two feet high, branching on every side near the top, garnished with oval, spear-shaped, trifoliate leaves, which are hairy on their under side, and stand upon short foot-stalks; the flowers are produced at the end of the branches in short spikes; they are of a purplish yellow colour and small; the stalks of this sort decay every autumn, and new ones arise in the spring. It is propagated by seeds, which should be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be planted in separate small pots, and plunged into a moderate hot-bed, observing to shade them until they have taken new root; then they should have a large share of air admitted to them in warm weather; in summer they must be exposed to the open air, but in the autumn they must be placed under a frame to screen them from frost; the following spring some of these plants may be shaken out of the pots, and planted in a warm border, where, if the summer proves warm, they will flower; but these seldom perfect their seeds, therefore two or three plants should be put into larger pots, and plunged into a moderate hot-bed, which will bring them early into flower; so that if the glasses are kept over them in bad weather, these will ripen their seeds in autumn, and the roots will continue some years, if they are screened from frost in winter.

The seventeenth sort also grows in *South Carolina*. This

hath a perennial root and an annual stalk, which grows erect about two feet high, garnished with long trifoliate leaves, rounded at their base where they are broadest, and narrowed all the way to a point; they are near three inches and a half long, and half an inch broad at their base, of a light green and smooth; the two side lobes sit pretty close to the stalk, but the middle one sits upon a foot-stalk an inch long; the flowers are produced in long spikes from the wings of the stalk, growing erect; the lower part of the spike is but thinly set with flowers, but on the upper part they are disposed very close; these are small, and of a bright yellow colour, sitting very close to the stalks, and are succeeded by jointed pods strait on one side.

This plant is propagated by seeds, and requires the same treatment as the last mentioned, with which it will flower and produce ripe seeds.

The eighteenth sort grows naturally in *Syria*, where it is one of the beauties of the country. It rises with shrubby stalks about three feet high, which branch out on every side, garnished with single smooth leaves, shaped like those of the broad-leaved Knot-grass, of a pale green, and stand on short foot-stalks; under these leaves come out thorns, which are near an inch long, of a reddish brown colour; the flowers come out from the side of the branches in small clusters; they are of a purple colour in the middle, and reddish about the rims; these are succeeded by pods, which are strait on one side, and jointed on the other, bending a little in shape of a sickle. This plant is at present pretty rare in the *English* gardens; it is propagated by seeds, which will frequently lie a year in the ground before they vegetate, therefore should be sown in pots filled with light earth, and plunged into a moderate hot-bed; and if the plants do not appear by the beginning of *June*, the pots should be taken out of the bed, and placed where they may have only the morning sun, keeping them clean from weeds; and in the autumn, they should be plunged into an old bed of tanners bark under a frame, where they may be screened from the frost and hard rains in the winter; in spring they should be plunged into a fresh hot-bed, which will bring up the plants: when these are fit to remove, they should be each planted into a separate small pot, and plunged into a very moderate hot-bed, shading them from the sun till they have taken new root; then they should be gradually hardened to bear the open air, into which they should be removed in *June*, placing them in a sheltered situation, where they may remain till the autumn, when if they are plunged into an old tan-bed under a frame, where in mild weather they may enjoy the free air, and be protected from frost, they will succeed better than if placed in a greenhouse, or tenderly treated. I have seen this plant growing in the full ground, in a very warm border, where by covering it in frosty weather, it had endured two winters, but a severe frost happening the third winter, entirely killed it.

From this shrub the *Persian* manna is collected, which is an exsudation of the nutritious juice of the plant. This drug is chiefly gathered about *Tauris*, a town in *Persia*, where the shrub grows plentifully. Sir *George Wheeler* found it growing in *Tinos*, and supposed it was an undescribed plant. *Tournefort* found it in plenty in many of the plains in *Armenia* and *Georgia*, and made a particular genus of it, under the title of *Alhagi*.

The nineteenth sort grows naturally in *India*, from whence the seeds have been lately brought to *Europe*, and several plants have been raised in the *English* gardens; these have leaves so like those of the Orange tree, as scarcely to be distinguished while young; but as there are not any plants here of a large size, so I can give no further account of it at present.

HEDYSARUM Zeylanicum majus & minus. See *Æschynomene*.

HELENIUM. *Lin. Gen. Plant.* 863. Bastard Sun-flower.

The Characters are,

It hath a flower composed of several hermaphrodite florets, which form the disk, and female half florets, which compose the rays. The hermaphrodite florets are tubulous; these have each five short hairy stamina, and an oblong germen, which afterward becomes an angular single seed, crowned by a small five-pointed empalement. The female half florets in the border are stretched out on one side like a tongue to form the ray; these are cut into five segments at their points; they have no stamina, but an oblong germen, which turns to a single seed, like those of the hermaphrodite flowers; these are all included in one common single empalement.

The Species are,

1. HELENIUM *foliis lineari-lanceolatis integerrimis glabris, pedunculis nudis unifloris*. Helenium with spear-shaped narrow leaves, which are smooth, entire, and naked foot-stalks with single flowers.

2. HELENIUM *foliis lanceolatis acutis serratis, pedunculis brevioribus, calycibus multifidis*. Helenium with pointed, spear-shaped, sawed leaves, shorter foot-stalks, and a many-pointed empalement.

These plants rise to the height of seven or eight feet in good ground; the roots when large send up a great number of stalks, which branch toward the top; those of the first sort are garnished with smooth leaves, which are three inches and a half long, and half an inch broad in the middle, with entire edges fitting close to the stalks, and from their base is extended a leafy border along the stalk, so as to form what was generally termed a winged stalk, but *Linnaeus* calls it a running leaf; the upper part of the stalk divides, and from each division arises a naked foot-stalk, about three inches long, sustaining one yellow flower at the top, shaped like a Sun-flower, but much smaller, having long rays, which are jagged pretty deep into four or five segments.

The second sort hath the appearance of the first, but the leaves are shorter and broader, ending in acute points, and are sharply sawed on their edges. The flowers stand upon shorter foot-stalks, growing closer together.

These plants are natives of *North America*, where they grow wild in great plenty. They may be propagated by seeds, or by parting their roots; the latter is generally practised in this country.

The best season to transplant and part the old roots is in *October*, when their flowers are past, or the beginning of *March*, just before they begin to shoot; but if the spring should prove dry, they must be duly watered, otherwise they will not produce many flowers the same year: these plants should not be removed oftener than every other year, if they are expected to flower strong; they delight in a soil rather moist than dry, provided it be not too strong, or hold the wet in winter.

HELENIUM. See *Inula*.

HELIANTHEMUM. *Tourn. Inst. R. H.* 248. tab. 128. Dwarf Cistus, or Sun-flower.

The Characters are,

The flower has a three-leaved empalement. It hath five roundish petals, with a great number of erect stamina. In the center is situated an oval germen, which afterward becomes a roundish or oval capsule of one cell, opening in three parts, filled with small roundish seeds.

The Species are,

1. HELIANTHEMUM *caulibus procumbentibus suffruticosis, foliis oblongis subpilosis, stipulis lanceolatis*. Dwarf Cistus with trailing shrubby stalks, oblong hairy leaves, and spear-shaped stipulæ.

2. HELIANTHEMUM *caulibus procumbentibus suffruticosis ramosissimis, spicis florum longioribus*. Dwarf Cistus with trailing shrubby stalks full of branches, and longer spikes of flowers.

3. HELIANTHEMUM *caulibus suffruticosis pilosis, foliis lanceolatis obtusis, spicis reflexis*. Dwarf Cistus with hairy shrubby stalks, blunt spear-shaped leaves, and reflexed spikes of flowers.

4. HELIANTHEMUM *incanum, caulibus suffruticosis erectis, foliis lanceolatis hirsutis*. Hoary dwarf Cistus with erect shrubby stalks, and hairy spear-shaped leaves.

5. HELIANTHEMUM *caule procumbente non ramoso, foliis linearibus incanis oppositis*. Dwarf Cistus with an unbranched trailing stalk, and narrow hoary leaves placed opposite.

6. HELIANTHEMUM *caule suffruticoso procumbente, foliis linearibus alternis, floribus auriculatis*. Dwarf Cistus with a shrubby trailing stalk, very narrow leaves placed alternate, and auriculated flowers.

7. HELIANTHEMUM *caule suffruticoso procumbente, foliis lanceolatis oppositis, pedunculis longioribus, calycibus hirsutis*. Dwarf Cistus with a shrubby trailing stalk, spear-shaped leaves placed opposite, longer foot-stalks to the flowers, and hairy empalements.

8. HELIANTHEMUM *caule suffruticoso procumbente, foliis linearibus oppositis, floribus umbellatis*. Dwarf Cistus with a shrubby trailing stalk, very narrow leaves placed opposite, and flowers growing in an umbel.

9. HELIANTHEMUM *caulibus procumbentibus suffruticosis glabris, foliis ovato-lanceolatis oppositis, pedunculis longioribus*. Dwarf Cistus with shrubby trailing stalks, which are smooth, oval spear-shaped leaves placed opposite, and longer foot-stalks to the flowers.

10. HELIANTHEMUM *caule lignoso perenne, foliis radicalibus ovatis trinerviis tomentosiss caulinis glabris lanceolatis alternis*. Perennial dwarf Cistus with a woody stalk, whose lower leaves have three veins, are oval, woolly, and those on the stalks smooth, spear-shaped, and placed alternate.

11. HELIANTHEMUM *caulibus sessilibus suffruticosis, foliis lanceolatis oppositis tomentosiss caule florali racemoso*. Dwarf Cistus with very short shrubby stalks, woolly spear-shaped leaves placed opposite, and a branching flower-stalk.

12. HELIANTHEMUM *caule suffruticoso procumbente, foliis ovatis nervosis, subtus incanis*. Dwarf Cistus with a shrubby trailing stalk, and oval veined leaves, white on their under side.

13. HELIANTHEMUM *caule suffruticoso, foliis lineari lanceolatis oppositis subtus tomentosiss*. Dwarf Cistus with a shrubby stalk, and narrow spear-shaped leaves placed opposite, which are woolly on their under side.

14. HELIANTHEMUM *caule suffruticoso erecto, foliis linearibus margine revolutis subtus incanis*. Dwarf Cistus with a shrubby erect stalk, and narrow leaves reflexed on their edges, with their under side hoary.

15. HELIANTHEMUM *caulibus suffruticosis procumbentibus, foliis oblongo-ovatis subhirsutis, petalis acuminatis reflexis*. Dwarf Cistus with trailing shrubby stalks, oblong oval hairy leaves, and acute-pointed reflexed petals to the flowers.

16. HELIANTHEMUM *caule suffruticoso erecto, foliis lanceolatis incanis glabris caule florali ramoso*. Dwarf Cistus with a shrubby upright stalk, hoary spear-shaped leaves, which are smooth, and branching flower-stalks.

17. HELIANTHEMUM *caule suffruticoso, foliis oblongo-ovatis oppositis, summis linearibus alternis*. Dwarf Cistus with a shrubby stalk, oblong oval leaves placed opposite, those toward the top being narrow and alternate.

18. HELIANTHEMUM *caule herbaceo hirsuto, foliis lanceolato-linearibus pilosis, pedunculis longioribus*. Dwarf Cistus with an herbaceous stalk, which is hairy, narrow, spear-shaped,

shaped, hairy leaves, and longer foot-stalks to the flowers.

19. *HELIIANTHEMUM caule herbaceo, foliis subovatis pilosis, flore fugaci.* Dwarf Cistus with an herbaceous stalk, hairy oval leaves, and a fugacious flower.

20. *HELIIANTHEMUM caule herbaceo erecto, foliis lanceolatis oppositis, floribus solitariis, capsulis maximis.* Dwarf Cistus with an erect herbaceous stalk, spear-shaped leaves placed opposite, flowers growing singly, and very large capsules.

21. *HELIIANTHEMUM caule herbaceo ramoso, foliis oblongo-ovatis oppositis, summis alternis, floribus solitariis.* Dwarf Cistus with a branching herbaceous stalk, oblong oval leaves placed opposite, those toward the top, growing alternate, and solitary flowers.

22. *HELIIANTHEMUM foliis fasciculatis.* Royen. Dwarf Cistus with leaves growing in bunches.

23. *HELIIANTHEMUM caule fruticoso succulento, foliis ovatis carnosiss, floribus racemosis.* Dwarf Cistus with a shrubby succulent stalk, oval fleshy leaves, and branching flowers.

24. *HELIIANTHEMUM caule herbaceo procumbente, foliis ovatis tomentosis sessilibus.* Dwarf Cistus with an herbaceous trailing stalk, and oval woolly leaves sitting close to the branches.

The first sort grows naturally on the chalky hills and banks in many parts of *England*; the stalks of this plant are ligneous and slender, trailing upon the ground, extending themselves near a foot each way, garnished with small oblong leaves, of a dark green on their upper side, but of a grayish colour on their under. The flowers are produced at the end of the stalks, in loose spikes; they are composed of five deep yellow petals, which spread open in the day, but shut close in the evening.

The second sort grows naturally in *Germany*; the stalks of this are much larger, and extend farther than those of the first; the leaves are longer and hoary: there are three acuminate stipula at each of the lower joints, which are erect. The spikes of flowers are much longer than those of the former, and the flowers are white and larger.

The third sort grows naturally in the south of *France*, in *Italy*, and *Germany*. The stalks of this grow more erect than either of the former, and are ligneous. The joints are farther asunder; the leaves are longer and hairy; the spikes of flowers are generally reflexed; they are white, and the size of those of the second; the stipula of this are very narrow.

The fourth sort grows naturally on the *Apennine* mountains; the stalks of this are more erect than those of the third. The leaves are not so long, the stipula are very small, and the whole plant is very hoary. The flowers are white, and the spikes are shorter and more compact than either of the former.

The fifth sort grows naturally in the south of *France*, in *Spain*, and *Istria*; this hath low trailing stalks, which are ligneous, but seldom branch, and are not more than four or five inches long. The leaves are narrow and hoary, and have no stipula at their base. The flowers are white, and grow in small clusters at the end of the stalks; this sort seldom continues longer than two years.

The sixth sort hath trailing shrubby stalks, which extend a foot in length, garnished with very narrow smooth leaves placed alternate; these have no stipula at their base. The flowers are placed thinly toward the end of the branches, they are yellow and auriculated; this grows in the south of *France* and *Italy*.

The seventh sort hath very long, trailing, ligneous stalks, garnished with spear-shaped leaves, placed opposite, which are very hairy, and gray on their under side, having at their base three long narrow stipula. The spikes of flowers

are near a foot in length, but grow thinly; they are large, and of a deep yellow colour, with very hairy empalements; this grows naturally in the south of *France* and *Spain*.

The eighth sort hath very shrubby crooked stalks, covered with a purplish brown bark like the common Heath. The branches are slender, garnished with narrow stiff leaves, like those of Thyme, which stand opposite, having no stipula at their base. The flowers are produced on naked foot stalks, which terminate the branches in a sort of umbel; they are of a pale yellow colour, and smaller than those of the common sort; this grows naturally on the sands near *Fontainebleau*, in *France*.

The ninth sort grows naturally in *Germany*; this sends out from a ligneous root, a great number of trailing stalks, which extend more than a foot each way; they are smooth, with a dark brown bark, garnished with oval, spear-shaped, smooth leaves, placed opposite, having at their base three spear-shaped stipula. The flowers are large, yellow, and grow in short clusters at the end of the branches.

The tenth sort grows naturally in *Spain*; this hath a short, thick, woody stalk, from which come out several side branches, garnished with oval woody leaves, having three longitudinal veins. The flower-stalk which arises from the main stem, grows about nine inches high, having two or three narrow leaves placed alternate. The flowers are produced on pretty long pedicles toward the top of the stalk, and have very smooth empalements.

The eleventh sort was sent from *Verona*, where it grows naturally; this hath a low shrubby stalk, from which come out a few short branches, garnished with small, woolly, spear-shaped leaves, placed opposite. The flower-stalk rises about six inches high, it branches toward the top, where the flowers are produced on pretty long foot-stalks; they are white, and smaller than those of the common sort.

The twelfth sort hath long shrubby stalks, which trail on the ground, and divide into many branches, garnished with oval veined leaves of a light green on their upper side, but grayish below, with three narrow erect stipula at their base. The flowers are pretty large, white, and grow in clusters at the end of the branches.

The thirteenth sort hath shrubby stalks, which grow pretty upright, garnished with narrow spear-shaped leaves, placed opposite, woolly on their under side, with three very narrow stipula growing at their base. The flowers are white, growing in long spikes at the end of the branches; this grows naturally in the south of *France*.

The fourteenth sort hath an erect shrubby stalk, which sends out many side branches, whose joints are pretty close, garnished with very narrow leaves, placed opposite, whose borders are reflexed; their upper side is of a lucid green, and their under side hoary. The flowers are pretty large, white, and grow in small clusters at the end of the branches; this grows naturally in *Spain*.

The fifteenth sort was found by Mr. *Edmund du Bois*, near *Croydon*, in *Surry*, and was at first only supposed to be an accidental variety of the common sort, but the seeds of this always produce the same. This is very like the common sort, but the leaves are hairy. The petals of the flowers are star-pointed, and smaller than those of the common sort.

The sixteenth sort hath shrubby stalks, which rise a foot and a half high, sending out branches the whole length, garnished with small, spear-shaped, smooth, silvery leaves, placed opposite. The flower-stalks branch, and the flowers, which are white, are produced in short spikes at the end of the branches.

The seventeenth sort was found growing naturally by the late Dr. *William Sberard*, near *Smyrna*; this hath shrubby stalks,

stalks, garnished with oblong oval leaves placed opposite, but those toward the top are narrow, and placed alternate. The flowers are produced at the end of the branches in long loose spikes, they are of a Rose colour, and the size of those of the common sort.

The eighteenth sort is annual; this grows naturally in *France, Spain, Italy*, and in *Jersey*, where the late Dr. *William Sherrard* found it; this hath a branching herbaceous stalk, which rises four or five inches high, garnished with narrow spear-shaped leaves, placed opposite, which are covered with hairs; those on the upper part of the stalks are placed alternate, and are narrower. The flowers are produced in loose spikes at the end of the branches, standing upon long foot-stalks, they are small, and composed of five yellow petals, with a dark purple spot at the base of each; these flowers are very fugacious, for they open early in the morning, and their petals drop off in a few hours after, so that by ten of the clock the flowers are all fallen.

The nineteenth sort grows naturally upon mount *Baldus*; this is an annual plant, which sends out many herbaceous stalks from the root, garnished with oval leaves, which are hairy. The flowers are produced in loose spikes at the end of the branches, they are of a pale yellow colour, and very fugacious, seldom lasting two hours before the petals fall off; there is another variety of this which grows about *Verona*, with upright stalks.

The twentieth sort grows naturally in the south of *France* and *Italy*, and was found by the late Dr. *William Sherrard*, growing near *Smyrna*, who sent the seeds to *England* and *Holland* by a new title, supposing it to be a different plant; but when it was cultivated here, it proved to be the same with that growing in the south of *France*, for this plant puts on different appearances, according to the soil and situation where it grows; where the plants stand single, and are not injured by weeds, they will rise near a foot and a half high, the leaves will be two inches and a half long, and near half an inch broad in the middle; but in a poor soil, or where the plants stand too close, or are injured by weeds, or neighbouring plants, they do not rise more than half that height; the leaves are much narrower, and the seed vessels not half so large, so that any person finding these plants, in two different situations, may be deceived, and take them for different species; but when they are cultivated in a garden in the same soil and situation, they do not differ in any particular. This is an annual plant, which perishes soon after the seeds are ripe.

The twenty-first sort is an annual plant, which grows naturally in *Spain* and *Portugal*; this hath branching stalks, which rise a foot high, garnished with oval oblong leaves, placed opposite, on the lower part of the stalk, but on the upper part, they are alternate and narrow, a single leaf being placed between each flower, which occasions the title of Solitary Flowers, for they grow in loose spikes at the end of the branches, in the same manner as the other species.

The twenty-second sort was sent me by Dr. *Adrian Van Royen*, who received the seeds from the *Cape of Good Hope*. This rises with a shrubby stalk about nine inches high, garnished with very narrow fine leaves, growing in clusters; the flowers come out from the side and at the end of the branches, standing upon slender foot-stalks; they are of a pale straw colour, and are very fugacious, seldom continuing longer than two hours before the petals fall off. This seldom continues longer than two years.

The twenty-third sort was sent me by the late Dr. *William Housoun* from *Campeachy*, where he found it growing naturally. This hath a succulent stalk, which rises near three feet high, garnished with oval, fleshy, succulent leaves, like those of Purslain, which are placed

alternate; the flower-stalks arise from the main stem, which are naked and near two feet high, branching out on each side in smaller foot-stalks, which are again branched into many smaller, each sustaining a small Kote-coloured flower.

The twenty-fourth sort grows naturally about *Kendal* in *Westmoreland*, and in some parts of *Lancashire*, upon rocky situations. This hath trailing herbaceous stalks, which seldom extend more than three or four inches, garnished with oval leaves, which are very woolly, and fit close to the branches; the flowers are produced at the upper part of the branches, they are white and small, so make no great appearance.

All the perennial sorts of dwarf *Cistus* (except the twenty-third) are hardy, so will thrive in the open air in *England*; they are propagated by seeds, which may be sown in the places where the plants are to remain, and will require no other care but to keep them clean from weeds, and thin them where they are too close, always observing to leave those sorts at a farther distance, whose stalks trail on the ground, and grow to the greatest length. These plants will continue several years, especially in a poor dry soil, but in rich ground or moist situations, they seldom last long; but as they ripen seeds in plenty, so they may be easily repaired. They all flower about the same time as the common sort, and their seeds ripen in the autumn.

The annual sorts may be propagated with as great facility, for if their seeds are sown upon a bed of common earth in *April*, the plants will come up in *May*, and require no other culture, but to thin them where they are too close, and keep them clear from weeds. These will flower in *July*, and the seeds ripen in the autumn. The twenty-second sort will thrive in the full ground in the same manner as the other, but unless the summer proves favourable, the seeds will not ripen: the roots have stood through the winter when the season has proved mild, without any shelter, and have flowered the following summer.

The twenty-third sort grows naturally in the warm parts of *America*. Father *Plumier* discovered it first in some of the *French* islands, and Dr. *Housoun* found it growing plentifully about *Campeachy*. This sort is propagated by seeds, which should be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a small pot filled with light, sandy, undunged earth, and plunged into a moderate hot-bed of tanners bark, and treated in the same manner as other tender plants from the same country; in the autumn they must be placed in a warm stove, and the second year the plants will flower, but they have not as yet produced seeds in *England*.

The twenty-fourth sort requires a shady situation, otherwise it will not thrive here.

HELIANTHUS. *Lin. Gen. Plant.* 877. Sun-flower.

The Characters are,

It hath a compound radiated flower, the border or rays being composed of female half florets, which are barren, and the disk of hermaphrodite florets which are fruitful, contained in one common scaly empalement. The hermaphrodite florets are cylindrical, cut at the brim into five acute segments; these have five stamina. The germen, which is situated at the bottom of the tube, afterward becomes an oblong, blunt, four-cornered seed. The female half florets, which compose the border, are not fruitful.

The Species are,

1. HELIANTHUS *foliis omnibus cordatis, nervis pone basin unitis, extrorsum denudatis. Lin. Sp. Plant.* 904. Sun-flower whose leaves are all heart-shaped, veins uniting behind at the base, but toward the border naked; commonly called annual Sun-flower.

2. HELIANTHUS *foliis inferioribus cordatis, nervis pone basin unitis denudatis, superioribus ovatis. Lin. Sp. Plant.* 905. Sun-

Sun-flower whose under leaves are heart-shaped, veins united behind at their base, and the upper leaves oval; commonly called perennial Sun-flower.

3. *HELIANTHUS foliis ovato-cordatis, nervis intra folium unitis.* Lin. Sp. Plant. 905. Sun-flower with oval heart-shaped leaves, whose nerves unite in the leaf; commonly called Jerusalem Artichoke.

4. *HELIANTHUS radice fussi formi.* Hort. Cliff. 420. Sun-flower with a spindle-shaped root.

5. *HELIANTHUS foliis lanceolatis scabris caule striato, infernè glabro.* Lin. Sp. Plant. 905. Sun-flower with rough spear-shaped leaves, a slender stalk, smooth toward the bottom.

6. *HELIANTHUS foliis oppositis sessilibus ovato-oblongis trinerviis, paniculâ dichotomâ.* Lin. Sp. Plant. 906. Sun-flower with oblong, opposite, oval leaves, having three veins, and sitting close to the stalk, and a dichotomous panicle.

7. *HELIANTHUS foliis lanceolatis oppositis, supernè scabris, infernè trinerviis, caule dichotomo romoso.* Sun-flower with spear-shaped leaves placed opposite, whose upper surface is rough, the under leaves having three veins, and a divided stalk.

8. *HELIANTHUS caule ramosissimo, foliis lanceolatis scabris, inferioribus oppositis, summis alternis petiolatis, calycibus foliosis.* Sun-flower with a very branching stalk, rough spear-shaped leaves placed opposite at bottom, but alternate toward the top, having foot-stalks, and leafy empalements.

9. *HELIANTHUS foliis ovatis crenatis trinerviis scabris, squamis calycinis erectis longitudine disci.* Flor. Virg. 103. Sun-flower with oval, rough, crenated leaves, having three nerves, the scales of the empalement being erect, and as long as the disk of the flower.

10. *HELIANTHUS caule infernè lævi foliis lanceolato-cordatis, radiis decapetalis.* Lin. Sp. Plant. 905. Sun-flower, with a stalk smooth on the upper side, heart spear-shaped leaves, and ten petals in the rays.

All these species of Sun-flowers are natives of *America*, from whence we are often supplied with new kinds; and it is very remarkable, that there is not a single species of this genus that is *European*; so that before *America* was discovered, we were wholly unacquainted with these plants. But although they are not originally of our own growth, yet are they become so familiar with our climate, as to thrive and increase full as well as if they were in their native country (some of the very late flowering kinds excepted, which require a longer summer than we generally enjoy, to bring them to perfection;) and many of them are now so plentiful in *England*, that persons unacquainted with the history of these plants, would imagine them at least to have been inhabitants of this island many hundred years: particularly the *Jerusalem Artichoke*, which, though it doth not produce seeds in our climate, yet doth so multiply by its knobbed roots, that, when once well fixed in a garden, it is not easily to be rooted out.

The first sort is annual, and so well known as to require no description. There are single and double flowers of two different colours, one of a deep yellow, and the other of a sulphur colour; but these vary, so are not worthy to be mentioned as different. They are easily propagated by seeds, which should be sown in *March*, upon a bed of common earth; and when the plants come up, they must be thinned where they are too close, and kept clean from weeds; when the plants are grown six inches high, they may be taken up with balls of earth to their roots, and planted into the large borders of the pleasure-garden, observing to water them till they have taken new root, after which they will require no other care, but to keep them clear from weeds.

In *July* the great flowers upon the tops of the stems will

appear, amongst which, the best and most double flowers of each kind should be preserved for seeds; for those which flower later upon the side branches are neither so fair, nor do they perfect their seeds so well, as those which first appear: when the flowers are quite faded, and the seeds are formed, they should be carefully guarded from the sparrows, which will otherwise devour most of the good seeds: about the beginning of *October*, when the seeds are ripe, the heads should be cut off, with a small part of the stem, and hung up in a dry airy place for about a month, by which time the seeds will be perfectly dry and hard; when they may be easily rubbed out, and put up in bags or papers, to preserve them from vermin until the season for sowing them.

The seeds of this sort of Sun-flower are excellent food for domestic poultry, therefore where a quantity of it can be saved, it will be of great use, where there are quantities of these fowls.

The other perennial sorts rarely produce seeds in *England*, but most of them increase very fast at their roots, especially the creeping rooted kinds, which spread too far for small gardens. The second sort, which is the most common in the *English* gardens, is the largest and most valuable flower, and is a very proper furniture for large borders in great gardens, as also for bosquets of large growing plants, or to intermix in small quarters with shrubs, or in walks under trees, where few other plants will thrive; it is also a great ornament to gardens within the city, where it grows in defiance of the smoke, better than most other plants; and for its long continuance in flower, deserves a place in most gardens, for the sake of its flowers for basons, &c. to adorn halls and chimneys in a season when we are at a loss for other flowers. It begins flowering in *July*, and continues until *October*. The sort with single flowers is now little valued, since that with double flowers is become common.

The third, fourth, fifth, sixth, and seventh sorts, may also have a place in some large borders of the garden, for the variety of their flowers; which, though not so fair as those of the common sort, yet will add to the diversity; and as many of them are late flowerers, so by encouraging these plants we may continue the succession of flowers longer.

These sorts are all of them very hardy, and will grow in almost any soil or situation; they are propagated by parting their roots into small heads, which in one year's time will spread and increase greatly. The best season for this work is in the middle of *October*, soon after the flowers are past, or very early in the spring, that they may be well rooted before the droughts come on; otherwise their flowers will be few in number, and not near so fair.

The *Jerusalem Artichoke* is propagated in many gardens for the roots, which are by some people esteemed; but they are watery and flashy, and very subject to trouble the belly by their windy quality, which hath brought them almost into disuse.

These are propagated by planting the smaller roots, or the larger ones cut into pieces, observing to preserve a bud to each separate piece, either in the spring or autumn, allowing them a good distance, for their roots will greatly multiply; the autumn following when their stems decay, the roots may be taken up for use. These should be planted in some remote corner of the garden, for they are very unsightly while growing, and their roots are apt to over-run whatever grows near them, nor can they be easily destroyed when they are once well fixed in a garden.

The other species which have been ranged under this genus by *Tournefort* and others, are now removed to the following genera, under which titles they may be found:

Corona Solis. See } Coreopsis.
Helenium.
Rudbeckia.
Silphium.

HELICTERES. *Lin. Gen. Plant.* 913. Screw tree.

The Characters are,

The flower has a coriaceous empalement of one leaf. It hath five oblong equal petals, which are fixed to the empalement, and ten short stamina at the base of the germen, with five nectariums surrounding the germen, which have the appearance of petals. The style supports the germen at the top, which afterward turns to a twisted spiral fruit with one cell, inclosing many kidney-shaped seeds.

The Species are,

1. HELICTERES *foliis cordato-ovatis serratis, subtus tomentosis, fructu tereti contorto.* Helicteres with oval heart-shaped leaves which are sawed, woolly on their under side, and a taper twisted fruit,

2. HELICTERES *foliis cordatis acuminatis serratis, subtus tomentosis, fructu brevi contorto.* Helicteres with heart-shaped, pointed, sawed leaves, woolly on their under side, and a short twisted fruit.

3. HELICTERES *caule arboreo villoso, foliis cordatis crenatis nervosis subtus tomentosis fructu ovato contorto villosissimo.* Helicteres with a tree-like hairy stalk, heart-shaped, nervous, crenated leaves, woolly on their under side, and an oval, twisted, very hairy fruit.

The first sort grows naturally in the *Babama* islands. This rises with a shrubby stalk five or six feet high, sending out several lateral branches, covered with a soft yellowish down, and garnished with heart-shaped leaves four inches long, and two inches and a half broad, sawed on their edges, woolly on their under side, standing on long foot-stalks; at the upper part of the branches the flowers come out opposite to the leaves, upon slender foot-stalks, which are jointed; these are composed of five oblong white petals, and in the center arises the style, which is three inches long, and curved; upon the top of which is situated the germen, crowned by an acute stigma. The germen afterward turns to a taper fruit two inches and a half long, composed of five capsules, which are closely twisted over each other like a screw; these are hairy, and have each one cell, containing several kidney-shaped seeds.

The second sort grows naturally in *Jamaita*. This rises with a shrubby stalk nine or ten feet high, sending out many lateral branches, covered with a smooth brown bark, garnished with heart-shaped sawed leaves, which end in acute points, woolly on their under side; the flowers are produced on the side of the branches, on shorter foot-stalks than the former: they are composed of five petals, the style in the center is strait, upright, and not half so long as in the other; the fruit is thicker, not an inch long, but twisted in the same manner.

The third sort rises with a strong woody stalk twelve or fourteen feet high, sending out many ligneous branches, closely covered with hairy down, and garnished with large heart-shaped leaves, which are crenated on their edges, having large veins running from the midrib to the sides; the leaves are of a yellowish green, and a little woolly on their under side: the flowers are produced from the side of the branches, and are of a yellowish white colour, larger than those of the other sorts. The style is near four inches long, curved like that of the first sort; the fruit is oval, about one inch long, very thick at the bottom, and closely covered with hairy down. This sort grows naturally at *Carthagena*.

These plants are propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are strong enough to remove, they should be each planted in a separate small pot, and plunged into a moderate hot-

bed of tan, observing to shade them from the sun till they have taken new root; then they should be treated in the same way as other tender plants from hot countries, raising the glasses every day in proportion to the weather, that the plants may enjoy fresh air, which will strengthen them, and prevent their drawing up weak. In the summer the plants may remain under the frames, if there is a sufficient height for them to grow; but in autumn they must be plunged into the tan-bed in the stove, where they should always remain, being careful to shift them into larger pots when they require it, and not to give them too much wet in winter; in summer they should have a large share of air in warm weather, and require to be often refreshed with water: the second year from the seeds these plants have often flowered in the *Chelsea* garden, and the seeds have some years ripened there, but the plants will live several years with proper management.

HELIOCARPOS. *Lin. Gen. Plant.* 533.

The Characters are,

The flower hath one petal which is cut into five segments. It hath an empalement of one leaf, which is cut into five parts. In the center is situated a roundish germen, attended by several stamina, which afterward becomes an oval compressed capsule, about three lines long and two broad, with a transverse partition dividing it in two cells, each containing a single roundish seed ending in a point; the borders of the capsule are set with hairs, resembling rays.

We know but one Species of this plant, viz.

HELIOCARPOS. *Hort Cliff.* 211. *tab.* 16.

This plant was discovered by the late Dr. *Houssoun*, growing naturally about *Old Le Vera Cruz* in *New Spain*. It rises with a thick, soft, woody stalk, from fifteen to eighteen feet high, sending out several lateral branches toward the top, garnished with heart-shaped leaves full of veins, sawed on their edges and ending in acute points; the flowers are produced at the end of the shoots, in branching clusters; they are of a yellowish green, and are succeeded by flat compressed seed vessels of an oval shape, whose borders are closely set with threads, representing rays, of a brownish colour when ripe; these capsules are divided into two cells by an intermediate partition, in each of these is lodged a single roundish seed ending in a point.

The plant is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a hot-bed, treating them in the same way as other tender plants. While the plants are young, they require to be plunged in the tan-bed, but after they have acquired strength, they will thrive in the dry stove: in winter they should have but little water, and must be kept warm; but in summer they should have plenty of fresh air in mild weather, and must be frequently refreshed with water. With this management the plants will flower the third year, and produce good seeds, but may be preserved several years with proper care.

I have sowed seeds of this plant which had been kept ten years, and came up as well as if it had been sowed the former year; though from the appearance of the seeds, it seems as unlike to grow after the first year as any which I know.

HELIOTROPIUM. *Lin. Gen. Plant.* 164. Turnsole.

The Characters are,

The empalement of the flower is of one leaf, cut into five segments at the brim. The flower hath one petal with a tube the length of the empalement, cut into five parts, which are alternately larger than the other; the chaps of the tube is closed, and hath five prominent scales, joined in form of a star. It hath five short stamina and four germen at the bottom of the tube, which afterward becomes so many seeds, sitting in the empalement.

The Species are,

1. *HELIOTROPIUM foliis ovatis integerrimis tomentosis rugosis, spicis conjugatis.* Hort. Upsal. 33. Heliotrope with oval, entire, woolly, rough leaves, and conjugated spikes.

2. *HELIOTROPIUM foliis cordato-ovatis acutis scabrisculis, spicis solitariis, fructibus bifidis.* Flor. Zeyl. 70. Heliotrope with heart-shaped oval leaves which are pointed, rough single spikes of flowers, and bifid seeds.

3. *HELIOTROPIUM foliis ovato-lanceolato-acuminatis rugosis, spicis solitariis gracilioribus alaribus & terminalibus.* Heliotrope with spear-shaped oval leaves, which end in acute points, and a rough, slender, single spike of flowers proceeding from the sides and tops of the stalks.

4. *HELIOTROPIUM foliis oblongo-ovatis integerrimis glabris subtus incanis, floribus capitatis alaribus, caule arborecente.* Heliotrope with oblong, oval, entire, smooth leaves, which are hoary on their under side, flowers growing in heads from the wings of the stalks, and a tree like stalk.

5. *HELIOTROPIUM foliis ovatis crenatis oppositis, floribus capitatis alaribus dichotomis, caule arborecente.* Heliotrope with oval crenated leaves placed opposite, flowers growing in heads from the wings of the stalks, which diverge, and a tree-like stalk.

6. *HELIOTROPIUM foliis ovato-lanceolatis, spicis plurimis confertis, caule fruticoso.* Heliotrope with oval spear-shaped leaves, many spikes of flowers growing in clusters, and a shrubby stalk.

7. *HELIOTROPIUM foliis lanceolato linearibus glabris aveniis, spicis conjugatis.* Hort. Cliff. 45. Heliotrope with narrow, spear-shaped, smooth leaves without veins, and conjugated spikes of flowers.

8. *HELIOTROPIUM foliis lineari-lanceolatis obtusis tomentosis, floribus alaribus sessilibus, caule arboreo.* Heliotrope with narrow, obtuse, spear-shaped, woolly leaves, flowers sitting close to the side of the branches, and a tree-like stalk.

9. *HELIOTROPIUM foliis lanceolatis sessilibus, spicis solitariis alaribus & terminalibus, caule fruticoso.* Heliotrope with spear-shaped leaves sitting close to the branches, single spikes of flowers proceeding from the sides and tops of the stalk, which is shrubby.

10. *HELIOTROPIUM caule procumbente, foliis ovatis tomentosis integerrimis, spicis solitariis terminalibus.* Heliotrope with a trailing stalk, oval, woolly, entire leaves, and single spikes of flowers terminating the branches.

11. *HELIOTROPIUM foliis oblongo-ovatis tomentosis, spicis conjugatis terminalibus, caule fruticoso.* Heliotrope with oblong, oval, woolly leaves, and double spikes of flowers terminating the stalk, which is shrubby.

The first sort grows naturally in the south of France, in Spain, Italy, and most of the warmer countries in Europe. It is an annual plant, which succeeds better from seeds which scatter in the autumn, or if sown at that season, than in the spring; for when they are sown in the spring, they seldom come up the same year; but if the plant is once obtained, and the seeds suffered to shed, it will maintain itself without any trouble, requiring no other culture but to keep it clean from weeds, and thin the plants where they are too close.

This rises about seven or eight inches high, dividing into two or three branches, garnished with oval rough leaves, of a light green, standing upon pretty long foot-stalks alternately; the flowers are produced at the end of the branches in double spikes joined at the bottom, which are about an inch and a half long, turning backward like a scorpion's tail. The flowers are white, and appear in June and July; the seeds ripen in the autumn, soon after which the plant decays.

The second sort grows naturally in the West-Indies. This is annual, the stalk rises two feet high, branching out to-

ward the top; the leaves are rough and hairy, standing upon pretty long foot-stalks; the flowers are produced toward the end of the branches in single spikes, which are six inches long, turning backward at the top like the other species. The flowers are blue, and appear in July and August; the seeds ripen in September and October.

The third sort grows naturally in the West-Indies. This is a smaller plant than the former, seldom growing above a foot high; the leaves are one inch and a half long, and about half an inch broad; the spikes of flowers are very slender, and not more than two inches long; the flowers are small, and of a light blue colour. They appear at the same time with the former, and the seeds ripen in autumn.

The seeds of these two sorts must be sown on a hot-bed in the spring, and when the plants come up they must be transplanted on another hot bed to bring them forward, treating them in the same way as the Balsamine, and other tender annual plants; in June they may be taken up with balls of earth, and planted in the borders of the flower-garden, where they will flower and produce ripe seeds.

The fourth sort rises with a shrubby stalk six or seven feet high, the young branches are closely covered with a white down; the leaves on those are very hoary and entire, but those on the older branches are greener, and notched on their edges; at each joint of the stalks come out two short branches opposite, garnished with small hoary leaves placed opposite: these when bruised emit a strong odour, which to some persons is very disagreeable, but others are pleased with it. These plants rarely flower in England. The flowers are white, collected in roundish heads, which turn backward, and sit close to the branches; the leaves continue all the year, for which the plants are preserved in green-houses, to add to the variety in winter.

The fifth sort grows naturally in the Canary Islands. This rises with a woody stalk three or four feet high, dividing into many branches, garnished with oval hairy leaves, notched on their edges, growing opposite upon long foot-stalks, of an Ash-colour on their under side; the flowers are produced from the side of the branches on pretty long foot-stalks, each sustaining four short roundish spikes or heads, which divide by pairs, and spread from each other. The flowers are white, and appear in June and July, but are not succeeded by seeds in England. The leaves of this plant when bruised emit an agreeable odour, for which it is by some persons much esteemed; the gardeners have given it the title of Madam Maintenon.

The two last sorts are too tender to live through the winter in the open air in this country, so must be kept in a green-house during that season, but they only require to be screened from frost, so may be placed with Myrtles, and the other hardy green-house plants, where they may have a large share of air in mild weather, and be treated in the same way; they are easily propagated by cuttings during any of the summer months, which, if planted in a shady border, and duly supplied with water, will take root in five or six weeks, then they may be potted and placed in a shady situation till they have taken new root, after which they may be treated as the old plants.

The sixth sort grows naturally in Peru, from whence the seeds were sent by the younger Jussieu to the royal garden at Paris, where the plants produced flowers and seeds; and from the curious garden of duke D'Ayen, at St. Germain, I was supplied with some of the seeds, which have succeeded in the Chelsea garden, where the plants have flowered and perfected their seeds for some years.

This rises with a shrubby stalk three or four feet high, dividing into many branches, garnished with oval, spear-shaped, hairy, rough leaves, set on without order on short

foot-stalks. The flowers are produced at the end of the branches, in short reflexed spikes growing in clusters. The foot-stalks divide into two or three, and these divide again into lefs, each sustaining a spike of bluish flowers, which have a strong sweet odour. The plants continue in flower great part of the year, and those flowers which come out in summer are succeeded by ripe seeds in autumn.

It may be propagated either by seeds or cuttings. The seeds should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove they should be transplanted into small pots, and plunged into a hot-bed, where they should be shaded till they have taken new root; then they should be inured to the open air by degrees, into which they should be removed in summer, placing them in a sheltered situation, and in autumn they must be housed with other exotick plants in a good green-house, where they will flower great part of winter, so will make a good appearance among the Orange trees, and other green-house plants, with whose culture this plant will thrive. If the cuttings of this plant are put into pots during any of the summer months, and plunged into a moderate hot-bed, they will take root very freely, but these do not make so good plants as those raised from seeds.

The seventh sort grows naturally on the sea-shore in the *West-Indies*. This is an annual plant, whose branches trail upon the ground, and grow a foot long, garnished with narrow grayish leaves, which are smooth. The flowers are produced in double spikes from the side of their branches; they are white and small, so make no great appearance. It is propagated by seeds, and requires the same treatment as the second and third sorts.

The eighth sort rises with an upright woody stalk six or seven feet high, with a hoary bark full of marks where the leaves have grown; the upper part of the stalk divides into two or three strong woody branches, which grow erect, and are very closely garnished with long, narrow, woolly leaves, which stand on every side the branches without order. The flowers come out from the side of the stalks, to which they fit close; they are short and reflexed, like those of the other species: the flowers are purple, sitting in very woolly empalements, which are divided into five parts; the whole plant is very white and woolly, like the sea Cudweed, so makes an odd appearance. This is propagated by seeds, which must be procured from the places where it naturally grows, and should be sown in a tub of earth in the country; for when the dried seeds come over they seldom grow, and if they do it is not before the second year; so that if the seeds are sown as soon as they are ripe in a tub of earth to preserve them, when they arrive in *England*, the tub should be plunged into a hot-bed of tanners bark, which will bring up the plants; and when these are fit to remove they should be each planted in a separate small pot filled with earth, composed of sand and light undunged earth, with a little lime rubbish well mixed together, then plunged into a hot-bed of tanners bark, and shaded until they have taken new root, after which they must be treated as other tender exotick plants, always keeping them in the tan-bed in the stove, giving them but little water, especially during the winter season.

The ninth sort is a native of the *West-Indies*, where it grows plentifully on the sea-shore; it rises with an upright shrubby stalk a foot and a half high, garnished with small spear-shaped leaves, scarce one inch long, and one third of an inch broad in the middle, ending in acute points, sitting close to the stalk; they are hoary on their under side, but smooth above. The flowers are produced in single slender spikes, which come out from the side, and at the top of the stalks; they are but little recurved, especially those on the side, but those at top are more bent; they are white, so make but little appearance.

The tenth sort was sent me from *Cartbagena* in *New Spain*, where it grows naturally on the sandy shores. This is an annual plant with trailing stalks, which grow six or seven inches long, garnished with small oval leaves, which are woolly and entire. The flowers are produced at the end of the branches in single short spikes, which are reflexed; they are small and white, so make little appearance.

The eleventh sort was sent me by the late Dr. *Houfoun*, from *La Vera Cruz*, where he found it growing in plenty. This rises with a shrubby stalk three feet high, dividing into slender branches, which are closely garnished with oblong, oval, woolly leaves, placed without order. The flowers are produced at the end of the branches in double spikes, which are slender, short, and strait, not recurved as the other species. The flowers are small, white, and the plant is perennial.

These three last mentioned are propagated by seeds, but the difficulty of getting them fresh from *America*, and the uncertainty of their growing, unless they are sown abroad, and brought over in earth, has rendered them rare in *Europe*, and as they are plants of little beauty, so few persons have taken the trouble to procure them; besides, as they require a stove to preserve them in this country, and must have a peculiar soil and management like the eighth sort, so, unless for the sake of variety in botanick gardens, they are not worth cultivating here.

HELLEBORE. See Helleborus.

HELLEBORINE. See Serapias and Limadorum.

HELLEBOROIDES HYEMALIS. See Helleborus.

HELLEBORO RANUNCULUS. See Trollius.

HELLEBORUS. *Lin. Gen. Plant.* 622. Black Hellebore, or *Christmas Flower*.

The Characters are,

The flower hath no empalement; it hath five large, roundish, permanent petals, and many small nectaria, placed circularly. It hath a great number of stamina, and several compressed germen, which afterwards turn to compressed capsules with two keels, the lower being short, and the upper convex, filled with round seeds adhering to the seam.

The Species are,

1. HELLEBORUS caule multifloro folioso, foliis pedatis. *Lin. Sp. Plant.* 588. Hellebore with many flowers on a stalk, which are intermixed with leaves, and ramose leaves sitting on the foot-stalk; Bears Foot, or Setterwort.

2. HELLEBORUS caule multifloro folioso, foliis digitatis. *Lin. Sp. Plant.* 558. Hellebore with many flowers on a stalk, which are intermixed with leaves, and fingered leaves.

3. HELLEBORUS scapo sub-unifloro sub-nudo, foliis pedatis. *Hort. Upsal.* 157. Hellebore with one flower on a stalk, which is naked, and hand-shaped leaves sitting on the foot-stalk; true Black Hellebore, or *Christmas Rose*.

4. HELLEBORUS caule multifloro, foliis ternatis integerrimis. Hellebore with many flowers on a stalk, and leaves composed of three entire lobes.

5. HELLEBORUS flore folio insidente. *Hort. Cliff.* 227. Hellebore with the flower sitting upon the leaf, or *Winter Aconite*.

6. HELLEBORUS caule multifloro folioso, foliis digitatis ferratis amplioribus. Hellebore with many flowers upon a stalk, intermixed with leaves, and large fingered leaves, which are sawed.

The first sort grows naturally in woods in several parts of *England*, but particularly in *Suffex*, where I have seen it in great plenty. This hath a jointed herbaceous stalk, which rises two feet high, dividing into two or three heads, garnished with leaves, composed of eight or nine long narrow lobes, which join at their base. These are sawed on their edges, and end in acute points; those on the lower part of the stalk are much larger than the upper, which are small and

and narrow. The flower-stalk arises from the center of the plant, dividing into many branches, each sustaining several smaller foot-stalks, with one entire spear-shaped leaf upon each, and one large greenish flower at the top with purplish rims; these appear in winter, and the seeds ripen in the spring, which, if permitted to scatter, the plants will rise without care, and may be transplanted into woods, or in wilderness quarters, where they will grow in great shade, and make a good appearance at a season when there are but few plants in beauty.

The second sort grows naturally at *Ditton*, near *Cambridge*, and in the woods near *Stoken Church*, in *Oxfordshire*. The stalks of this sort grow more upright than those of the first, and do not branch so much. The leaves are composed of nine long lobes, which unite to the foot-stalk at their base, and are sharply sawed on their edges; they are of a lighter green than those of the first sort. The flowers are produced at the top of the stalk; they are composed of five oval green petals, with a great number of stamina surrounding the germen, situated in the middle; these appear the beginning of *February*, and the seeds ripen the end of *May*, which if sown soon after they are ripe the plants will come up early the following spring, and when they have obtained strength may be planted in shady places under trees, where they will thrive and flower very well. The leaves of this sort decay in autumn, and new ones arise from the roots in the spring, but the first sort is always green.

The third sort is supposed to be the Hellebore of the ancients; this grows naturally on the *Alps* and *Apennine* mountains, and also in the *Archipelago*. The root of this sort is composed of many thick fleshy fibres, which spread far into the ground, from which arise the flowers upon naked foot-stalks immediately from the root, each supporting one large white flower, composed of five roundish petals, with a great number of stamina in the middle. The leaves of this are composed of seven or eight thick, fleshy, obtuse lobes, which are slightly sawed on their edges, and unite with the foot-stalk at their base; this plant flowers in winter, from whence the title of *Christmas Rose* was applied to it. This is propagated by parting of the roots in autumn, for the seeds seldom ripen well in *England*.

The fourth sort is like the second, but differs from it in having trifoliate leaves, which are broader. This flowers early in winter, and the stalks rise higher than either of the former sorts, but is at present rare in *England*.

The fifth sort is the common Winter Aconite, which is so well known as to need no description. It flowers very early in the spring, which renders it worthy of a place in all curious gardens, especially as it requires but little room. This is propagated by offsets, which the roots send out in plenty. These roots may be taken up and transplanted any time after their leaves decay, which is generally by the beginning of *June* till *October*, when they will begin to put out new fibres; but as the roots are small, and nearly of the colour of the ground, so if care is not taken to search them many of the roots will be left in the ground. These roots should be planted in small clusters, otherwise they will not make a good appearance; for single flowers scattered about the borders of these small kinds, are scarce seen at a distance; but when these and the *Snowdrops* are alternately planted in bunches, they will have a good effect, as they flower at the same time, and are much of a size.

The sixth sort is like the first, but the lobes of the leaves are broader, and the stalks grow taller. This grows naturally in *Isria* and *Dalmatia*, from whence I received some of the seeds; it has been supposed to be only a seminal variety of the first, and as such I sowed the seeds, but the plants had a very great appearance, and the first winter proving severe they were all destroyed, so that it is not so hardy as

our common sort, and depending on their being so, occasioned the loss of the plants.

HELLEBORUS ALBUS. See *Veratrum*.

HELMET FLOWER, or MONK'S HOOD. See *Aconitum*.

HEMEROCALLIS. *Lin. Gen. Plant.* 391. Lily Asphodel, or Day Lily.

The Characters are,

The flower has no empalement; in some species the flower is of one petal cut into six parts, in others it hath six petals. There are six awl-shaped declining stamina surrounding the style. The roundish furrowed germen is situated in the middle, which afterward becomes an oval three-cornered capsule with three lobes, opening with two valves, filled with roundish seeds.

The Species are,

1. HEMEROCALLIS scapo ramoso, corollis monopetalis. *Hort. Upsal.* 88. Day Lily with a branching stalk, and the flower of one petal.

2. HEMEROCALLIS scapo compresso corollis monopetalis campanulatis. Day Lily with a compressed stalk, and a bell-shaped flower of one petal.

3. HEMEROCALLIS scapo ramoso, corollis monopetalis staminibus longioribus. Day Lily with a branching stalk, flowers of one petal, and longer stamina.

4. HEMEROCALLIS scapo simplici, corollis hexapetalis campanulatis. *Hort. Cliff.* 128. Day Lily with an unbranched single stalk, and bell-shaped flowers with six petals, or *St. Bruno's Lily*.

The first sort grows naturally in *Hungary*, *Dalmatia*, and *Isria*, but has long been an inhabitant in the *English* gardens. This hath strong fibrous roots, to which hang knobs, or tubers, like those of the *Asphodel*, from which come out keel-shaped leaves a foot and a half long, with a rigid midrib, the two sides drawing inward, so as to form a sort of gutter on the upper side. The flower-stalks are naked, and rise a foot and a half high, having two or three longitudinal furrows; at the top they divide into three or four short foot-stalks, each sustaining one pretty large yellow flower shaped like a Lily, having but one petal with a short tube, spreading open at the brim, where it is divided into six parts: these have an agreeable scent, from whence some have given it the title of yellow *Tuberose*. It flowers in *June*, and the seeds ripen in *August*: this plant is easily propagated by offsets, which the roots send out in plenty, which may be taken off in autumn, that being the best season for transplanting of the roots, and planted in any situation, for they are extremely hardy, and will require no other culture but to keep them clean from weeds, and to allow them room, that their roots may spread: they may also be propagated by seeds, which, if sown in autumn, the plants will come up the following spring, and these will flower in two years; but if the seeds are not sown till spring, the plants will not come up till the year after.

The second sort grows naturally in *Siberia*. This hath roots like those of the former sort, but are smaller. The leaves are not near so long, nor more than half the breadth of the former, and of a dark green colour. The flower-stalk rises a foot high, is naked and compressed, but has no furrows; at the top is produced two or three yellow flowers, which are nearer the bell-shape than those of the other species, and stand on shorter foot-stalks. It is propagated by offsets from the root, or by seeds in the same manner as the former, but the roots do not increase so fast; it should have a moist soil and a shady situation, where it will thrive much better than in dry ground.

The third sort is a much larger plant than either of the former, the roots spread and increase much more, therefore is not proper furniture for small gardens. The leaves are near three feet long, hollowed like those of the former,

turning back toward the top. The flower-stalks are as thick as a man's finger, and rise near four feet high; they are naked, without joints, and branching at the top, where are several large copper-coloured flowers, shaped like those of the red Lily, and as large. The stamina of this sort are longer than those of the other, and their summits are charged with a copper-coloured farina, which sheds on being touched; or if a person smells to the flowers it will fly off and spread over the face, dying it all over of a copper colour, which is a trick often played by some unlucky people to the ignorant. These flowers never continue longer than one day, but there is a succession of flowers on the same plants for a fortnight or three weeks. The roots of this sort, propagate too fast for those gardens where there is but little room. It will grow on any soil or situation; the best time to transplant the roots is in autumn.

The *Savoy Spiderwort*, or, as the *French* call it, *St. Bruno's Lily*, is a plant of humbler growth than either of the former: there are two varieties of this, one is titled *Liliastrum Alpinum majus*, and the other *Liliastrum Alpinum minus*, by *Tournefort*; the first of these rises with a flower-stalk more than a foot and a half high. The flowers are much larger, and there is a greater number upon each stalk than of the second; but as there is no other essential difference between them, I have not put them down as different species, but the first is by much the finer plant, though not common in *England*. The leaves of this sort are somewhat like those of the Spiderwort, are pretty firm, and grow upright; the flower-stalks grow about a foot high, and have several white flowers at the top, shaped like those of the Lily, which hang on one side, and have an agreeable scent; these are but of short duration, seldom continuing in beauty above three or four days, but when the plants are strong they will produce eight or ten flowers upon each stalk, so they make a good appearance while they last.

These sorts are usually propagated by parting the roots; autumn is the best season for doing this work, as it also is for transplanting of the roots; for when they are removed in the spring, they seldom flower the same year; or, if they do, it is but weakly. These plants should not be transplanted oftener than every third year, when the roots may be parted to make an increase of the plants, but they should not be divided too small, for if they are it will be two years before they flower: they delight in a light loamy soil, and in an open exposure, so must not be planted under the drip of trees; but if they are planted to an east aspect, where they may be protected from the sun in the heat of the day, they will continue in beauty longer than when they are more exposed.

HEMIONITIS, Moonfern.

This is a plant which is seldom propagated in gardens, therefore I shall not trouble the reader with any account of it more than this, That whoever hath a mind to cultivate any of the sorts, must procure the plants from the countries where they naturally grow. There are two sorts which are natives of the warmer parts of *Europe*, but in *America* there is a great number of very different kinds; these must be planted in pots filled with loamy undunged earth, and such of them as are natives of hot countries must be placed in the stove, the others may be sheltered under a common frame in winter, and during the summer they must be frequently watered, but in winter they will require but little. In summer they should also have plenty of free air admitted to them; with this management the plants will thrive.

HEPATICÆ. *Boerb. Ind. Plant.* Hepatica, or Noble Liverwort.

The Characters are,

The flower hath a three leaved empalement. It hath six petals, which are oval, with a great number of slender stamina,

shorter than the petals, and several germen collected into a head, which afterward turn to acuminated seeds sitting round the styles.

The Varieties of this plant are,

1. HEPATICÆ trifolia, cœruleo flore. *Clus.* The single blue Hepatica, or Noble Liverwort.
2. HEPATICÆ trifolia, flore cœruleo pleno. *Clus.* The double blue Hepatica, or Noble Liverwort.
3. HEPATICÆ trifolia, flore albo simplici. *Boerb. Ind.* The single white Hepatica, or Noble Liverwort.
4. HEPATICÆ trifolia, rubro flore. *Clus.* Single red Hepatica, or Noble Liverwort.
5. HEPATICÆ trifolio, flore rubro pleno. *Boerb. Ind.* Double red, or Peach-coloured Hepatica.

These plants are some of the greatest beauties of the spring; their flowers are produced in *February* and *March* in great plenty, before the green leaves appear, and make a very beautiful figure in the borders of the pleasure-garden, especially the double sorts, which commonly continue a fortnight longer in flower than the single, and the flowers are much fairer. I have seen the double white kind often mentioned in books, but could never see it growing, though I do not know but such a flower might be obtained from seeds of the single white, or blue kinds. I have sometimes known the double blue sort produce some flowers in autumn, which were inclining to white, and thereby some people have been deceived, who have procured the roots at that season, and planted them in their gardens, but the spring following their flowers were blue as before; and this is what frequently happens, when the autumn is so mild as to cause them to flower.

The single sorts produce seeds every year, whereby they are easily propagated, and also new flowers may be that way obtained. The best season for sowing of the seeds is in the beginning of *August*, either in pots or boxes of light earth, which should be placed so as to have only the morning sun until *October*, when they should be removed into the full sun, to remain during the winter season; but in *March*, when the young plants will begin to appear, they must be removed again to a shady situation, and in dry weather should be frequently watered; about the beginning of *August* they will be fit to be transplanted, at which time you should prepare a border, facing the east, of good fresh loamy earth, into which you should remove the plants, placing them at about six inches distance each way, closing the earth pretty fast to their roots, to prevent the worms from drawing them out of the ground, which they are very apt to do at that season; the spring following they will begin to shew their flowers, but it will be three years before they flower strong; till then you cannot judge of their goodness, when, if you find any double flowers, or any of a different colour from the common sorts, they should be taken up and transplanted into the borders of the flower-garden, where they should continue at least two years before they are taken up or parted; for it is remarkable in this plant, that where they are often removed and parted, they are very subject to die; whereas, when they are permitted to remain undisturbed for many years, they will thrive exceedingly, and become very large roots.

The double flowers, which never produce seeds, are propagated by parting their roots, which should be done in *March*, at the time when they are in flower; but you should be careful not to separate them into very small heads, nor should they be parted oftener than every third or fourth year, if you intend to have them thrive, for the reason before given. They delight in a loamy soil, and in an eastern position, where they may have only the morning sun.

HEPATORIUM. See Eupatorium.

HEPTAPHYLLUM. See Potentilla.

HERACLEUM. See *Spondylium and Panax*.

HERBA GERARDI. See *Angelica sylvestris minor*.

HERBA PARIS. See *Paris*.

HERMANNIA. *Tourn. Inst. R. H. 656. tab. 432.*

The Characters are,

The flower hath a pitcher shaped permanent empalement. It hath five petals, which twist against the sun within the tubulous empalement, but spread open above. It hath five broad stamina, joined in one body. In the center is situated a roundish five-cornered germen, which afterward becomes a five-cornered roundish capsule, with five cells opening at the top, inclosing many seeds.

The Species are,

1. HERMANNIA *foliis cuneiformibus plicatis, crenato-emarginatis. Hort. Cliff. 342.* Hermannia with wedge-shaped folded leaves, which are crenated and indented.

2. HERMANNIA *foliis obovatis acutè incis, pedunculis bifloris. Prod. Leyd. 347.* Hermannia with oval leaves acutely cut, and foot-stalks having two flowers.

3. HERMANNIA *foliis obovatis plicatis crenatis tomentosis. Hort. Cliff. 343.* Hermannia with oval, folded, woolly leaves, which are crenated.

4. HERMANNIA *foliis lanceolatis obtusis serratis. Hort. Cliff. 342.* Hermannia with obtuse spear-shaped leaves, which are sawed.

5. HERMANNIA *foliis oblongo-ovatis crenatis tomentosis flore mutabili.* Hermannia with oblong, oval, crenated, woolly leaves, and a changeable flower.

6. HERMANNIA *foliis pinnatifidis linearibus. Hort. Cliff. 342.* Hermannia with narrow leaves ending in many points.

7. HERMANNIA *foliis lanceolatis obtusis integerrimis. Hort. Cliff. 342.* Hermannia with obtuse spear-shaped leaves, which are entire.

The first sort rises with a shrubby stalk six or seven feet high, dividing into many irregular branches, covered with a brown bark, garnished with wedge-shaped leaves, which are narrow at their base, but broad and round at the top. The flowers are produced in short spikes on the upper part of the branches, of a deep colour, but small; these appear in *April* and *May*, but are rarely succeeded by seeds in *England*.

The second sort is a shrub of lower stature than the first, but sends out a great number of branches, garnished with smaller leaves than those of the former, which are rough, and sit close to the branches. The flowers are produced in short close spikes at the end of every shoot, so that the whole shrub seems covered with flowers; they are of a bright yellow, and appear toward the end of *April*, but are not succeeded by seeds in *England*.

The third sort is a plant of humbler growth than the former, seldom rising more than two feet and a half high; the stem is not so woody, and the branches are soft and slender, garnished with oval woolly leaves which are plaited, and crenated on the edges; the flowers are produced in loose panicles at the end of the branches; they are larger than those of the other species, and have very hairy empalements. This sort flowers in *June* and *July*.

The fourth sort has been longer in the *European* gardens, than either of the other. This rises with a shrubby upright stalk to the height of seven or eight feet, sending out many ligneous branches from the side, which also grow more erect than any of the other; these are clothed with obtuse spear-shaped leaves, sawed on the edges toward the end; the flowers come out in small bunches from the side of the stalk: they are of a pale straw colour, and appear in *May* and *June*; these are frequently succeeded by seeds, which ripen the latter end of *August*.

The fifth sort seldom rises more than two feet high, with

a soft ligneous stalk, sending out slender irregular branches, garnished with oblong, oval, woolly leaves, standing upon pretty long foot-stalks; the flowers are produced in loose spikes at the end of the branches; these are at their first appearance of a gold colour, but after they have been some days open they change to yellow. This flowers in *June* and *July*.

The sixth sort rises with a shrubby stalk near three feet high, sending out many slender branches, covered with a reddish bark, garnished with narrow wing-pointed leaves; the flowers come out from the side of the branches in small clusters; they are small, and of a deep yellow colour.

The seventh sort hath shrubby branching stalks, which are very bushy, but seldom rise more than a foot and a half high; the branches are very slender, garnished with hairy, pale, green leaves of different sizes; they are entire, and sit pretty close to the branches; the flowers come out from the side of the stalk singly; they are small, and of a deep yellow colour. This sort flowers most part of summer.

All the species of this genus yet known, are natives of the country about the *Cape of Good Hope*.

The plants are generally propagated by cuttings, which may be planted in any of the summer months, on a shady border, observing to water them until they are well rooted, which will be in about six weeks after planting; then they should be taken up, preserving a ball of earth to their roots, and planted into pots, placing them in a shady situation, until they have taken fresh root; after which they may be exposed to the open air, with *Myrtles*, *Geraniums*, &c. until the middle or latter end of *October*, when they must be removed into the green-house, observing to place them in the coolest part of the house, where they may have as much free air as possible; for if they are too much drawn in the house, they will appear sickly, and seldom produce many flowers; whereas, when they are only sheltered from the frost, and have a great share of free air, they will appear strong, healthy, and produce large quantities of flowers: they must be frequently watered, and will require to be new potted at least twice every year, otherwise their roots will be so matted as to prevent their growth.

HERMODACTYLUS, the *Hermodyl*, commonly called *Snakes-head Iris*.

This genus is, by *Dr. Linnæus*, joined to *Iris*, the characters of the flower agreeing pretty well with those of that genus, from which *Tournefort* has separated it by the difference of the root. As this plant requires a particular treatment, so I have continued it under *Tournefort's* title.

The Characters are,

It hath a *Lily-shaped* flower, consisting of one leaf, shaped exactly like an *Iris*, but has a tuberous root, divided into two or three dugs, like oblong bulbs.

We have but one Species of this plant, viz.

HERMODACTYLUS *folio quadrangulo. C. B. P.* This is also called, *Iris tuberosa Belgarum, i. e. Tuberous Iris of the Dutch*.

This plant is easily propagated by its tubers, which should be taken off soon after the green leaves decay, which is the proper season for transplanting the roots; but they should not be kept long out of the ground lest they shrink, which will cause them to rot when they are planted. They should have a loamy soil, not too strong, and must be planted to an east aspect, where they will flower very well. These roots should not be removed oftener than once in three years. The distance at which these roots should be planted is six inches square, and four inches deep in the ground. These produce their flowers in *May*, and their seeds are ripe in *August*; but as they multiply pretty fast by their roots, few people are at the trouble of raising them

them from seeds; but those who have an inclination so to do, must treat them in the manner directed for the bulbous Irises.

The roots of this plant are very apt to run deep into the ground, and then they seldom produce flowers; and many times they shoot so deep as to be lost, especially where the soil is very light; therefore to prevent this, it will be proper to lay a thickness of rubbish under the border where these are planted, to hinder them from getting down. This should always be practised in light ground, but in strong land there will be no occasion to make use of this precaution, because they do not shoot downward so freely in that.

HERNANDIA. *Plum. Nov. Gen.* 8. tab. 40. Jack-in-a-box, *vulgò*.

The Characters are,

It hath male and female flowers on the same plant; the male flowers have a partial involucre, composed of four oval small leaves, which inclose three flowers; each of these has a proper bell-shaped empalement of one leaf; the petal is funnel-shaped, cut into six parts at the brim; it hath three short stamina inserted in the empalement. The female flowers are shaped like the male, but want stamina; they have a roundish germen. The empalement afterward becomes a large, swollen, oblong fruit, perforated at each end, inclosing one hard globular nut.

There is but one Species of this genus, *viz.*

HERNANDIA. *Hort. Cliff.* 485. tab. 13. commonly called in the *West-Indies*, Jack-in-a-box.

This plant is very common in *Jamaica*, *Barbadoes*, *St. Christopher's*, and many other islands in the *West-Indies*, where it is known by the name of Jack-in-a-box. The fruit of this plant when ripe is perforated, and the nut in the inside becomes hard; so that when the wind blows through the fruit, it makes a whistling noise, which may be heard at a distance; from whence, I suppose, the inhabitants gave this name to the plant. It grows in the gullies, where there are rills of water.

In *Europe* this plant is preserved in curious gardens, with other tender exotick plants. It is propagated by sowing the seeds on a hot-bed in the spring, and when the plants are two inches high they should be transplanted each into a separate pot, and plunged into the hot-bed again, observing to water and shade them until they have taken root; after which time they must have air admitted to them, in proportion to the warmth of the air, or the heat of the bed in which they are placed. As the plants advance, they should be removed into larger pots; but in doing this, care should be taken not to break the roots, as also to preserve a good ball of earth to them; the plants must be screened from the sun until they have taken new root. The best time to shift these plants is in *July*, that they may be well rooted before the cold approaches; they must be constantly kept in the bark-stove; in winter they should have a moderate share of heat, and in the summer they must have plenty of air in hot weather. With this management the plants will grow to the height of sixteen feet or more, and the leaves being very large, will make a beautiful appearance in the stove. It hath not as yet flowered in *England*.

HERNIARIA. *Tourn. Inst. R. H.* 507. tab. 288. Rupturewort.

The Characters are,

The flower hath a coloured empalement of one leaf. It hath five small stamina, situated in the divisions of the empalement, and five others which are barren, placed alternately between them. In the center is an oval germen, which afterward turns to a small capsule inclosed in the empalement, having one oval pointed seed.

The Species are,

1. HERNIARIA *glabra*. *J. B.* 3. 378. Smooth Rupturewort.

2. HERNIARIA *hirsuta*. *J. B.* 3. 379. Rough or hairy Rupturewort.

3. HERNIARIA *alfines folio*. *Tourn. Inst.* 507. Rupturewort with a Chickweed leaf.

4. HERNIARIA *caulibus fruticosis floribus quadrifidis*. *Lin. Syst.* Rupturewort with shrubby stalks, and four-pointed flowers.

The two first sorts grow naturally in *England*, but not very common; they are low trailing plants, their branches lying on the ground; they have leaves like the smaller Chickweed, the first is smooth, and those of the second are hairy; the flowers come out in clusters from the side of the stalks at the joints; they are small, of a yellowish green, so make no appearance.

The third sort is an annual plant, which grows naturally in *France* and *Italy*. This doth not spread so much as either of the other sorts, but the flowers and leaves are somewhat like the first, but larger.

The fourth sort hath shrubby stalks, which trail upon the ground, garnished with small hairy leaves like the second sort; the flowers are also very like, but are four-cornered.

These plants are seldom cultivated but in botanick gardens, for the sake of variety. The three first are annual plants, which do not continue longer than one year, so should be permitted to shed their seeds, whereby they are better preserved than if sown with art. The fourth sort is an abiding plant, which may be propagated by cuttings; but as they are plants of no beauty, they are rarely preserved in gardens.

HESPERIS. *Tourn. Inst. R. H.* 222. tab. 108. Dame's Violet, Rocket, or Queen's Gilliflower.

The Characters are,

The flower is composed of four oblong petals, in form of a cross. It hath six awl shaped stamina, two of which are much shorter than the other. It hath a honey gland situated between the two short stamina, and a four-cornered germen the length of the stamina, but no style. The germen afterward becomes a plain, long, compressed pod with two cells, divided by an intermediate partition, inclosing many oval compressed seeds.

The Species are,

1. HESPERIS *caule simplici erecto, foliis lanceolatis denticulatis, petalis emarginatis*. Dame's Violet with a single erect stalk, spear-shaped indented leaves, and the petals of the flower indented at the top.

2. HESPERIS *caule simplici erecto, foliis ovato-lanceolatis integerrimis, petalis integris*. Dame's Violet with a single upright stalk, oval, spear-shaped, entire leaves, and the petals of the flower entire.

3. HESPERIS *caule simplici erecto, foliis lanceolatis acutis serratis, petalis mucrone emarginatis*. Dame's Violet with a single upright stalk, spear-shaped, acute, sawed leaves, and the tips of the petals indented.

4. HESPERIS *caule hispido ramoso patente*. *Hort. Upsal.* 187. Dame's Violet with a prickly, branching, spreading stalk.

5. HESPERIS *caule erecto, ramoso, hirsuto, foliis oblongo-cordatis, acutis sessilibus denticulatis, petalis integris*. Dame's Violet with a hairy, erect, branching stalk, oblong, heart-shaped, pointed, indented leaves, sitting close to the stalk, and the petals of the flower entire.

6. HESPERIS *caule ramosissimo diffuso, foliis lineari-lanceolatis dentatis, siliquis apice truncatis*. Dame's Violet with a very branching diffused stalk, narrow, spear-shaped, indented leaves, and the points of the pods shaped like a truncheon.

7. HESPERIS *foliis dentato-pinnatifidis, caule hervi*. *Lin. Sp. Plant.* 664. Dame's Violet with wing-pointed indented leaves, and a smooth stalk.

8. HESPERIS *caule ramosissimo diffuso, foliis lanceolatis serratis scabris, siliquis sessilibus*. *Lin. Sp. Plant.* 663. Dame's

Violet with very branching diffused stalks, spear-shaped, rough, sawed leaves, and the pods fitting close to the stalks.

9. *HESPERIS caule erecto ramoso, foliis cordatis amplexicaulibus serratis villosis. Lin. Sp. Plant. 664.* Dame's Violet with an erect branching stalk, and hairy, sawed, heart-shaped leaves embracing the stalk.

10. *HESPERIS caule ramoso diffuso, siliquis teretibus. Hort. Upsal.* Dame's Violet with a diffused branching stalk, and taper pods.

The first sort grows naturally in *Italy*. This was formerly in greater plenty in the *English* gardens than at present, having been long neglected because the flowers were single, and made but little appearance; however, as the flowers have a very grateful scent, so the plant is worthy of a place in every good garden. This rises with an upright stalk two feet and a half high, garnished with spear-shaped leaves, which sit close to the stalk; they are slightly indented on their edges, and end in acute points: the flowers are produced in a loose thyrse on the top of the stalks, composed of four roundish petals, indented at their points, of a deep purple colour, and smell very sweet, especially in the evening or in cloudy weather. It flowers in *June*, and the seeds ripen the latter end of *August*. It is a biennial plant, so that young plants should be raised every year, to supply the place of those which decay: if the seeds are permitted to scatter, the plants will come up without trouble in the spring; and if the seeds are sown, it should be in the autumn; because those which are sown in the spring often fail if the season proves dry, or will remain a long time in the ground before they vegetate.

There is a variety of this with double flowers in some of the gardens in *France*, but that which we have in *England* is a variety of the third sort with unfavoury flowers.

The second sort has been generally supposed only a variety of the first, differing in the colour of the flower, but is certainly a distinct species; the leaves of this are not so long, but much broader than those of the first, and their borders are entire; the flowers are not quite so large, nor do they form so good spikes; they are white, and have not so fine a scent as the first. This is also a biennial plant, requiring the same treatment as the first.

The third sort grows naturally in *Hungary* and *Austria*. This rises with an upright stalk two feet high, garnished with spear-shaped leaves, ending in acute points, sharply indented on their edges, of a dark green, and sit close to the stalks; the flowers grow in loose spikes on the top of the stalks; in some they are white, in others purple, and sometimes both colours striped in the same flower; these have no odour, so are not deserving of a place in gardens, but may be propagated in the same manner as the two former.

From this sort the double white and purple Rockets have been accidentally obtained, which are much esteemed for the beauty of their flowers; and if they had the agreeable odour of the garden Rocket, they would be some of the best furniture for the borders of the flower-garden, but they are without scent; however, for the beauty of their flowers, they are by some greatly esteemed.

These plants with single flowers rarely survive the second year; nor will those with double flowers continue much longer, therefore young plants should be annually raised to supply the place of the old ones, otherwise there will soon be a want of them, which is what few persons are careful enough to observe, but thinking the roots to be perennial, trust to their putting out offsets, and finding them decay, are apt to think their soil very improper for them, and are at a loss to account for their decaying; whereas, when the plants have flowered, they have finished their period, and seldom continue to flower a second time from the same root;

though in poor land they will often put out a few weak offsets, which may flower again, but seldom so strong as the principal roots; therefore those who are desirous to propagate these plants, should do it in the following manner:

There should be some strong roots of each sort kept apart for this purpose, which should have their flower-stalks cut down soon after they come out, which should be planted in a gentle loamy soil, to an east exposure, where they may have only the morning sun, and covered with hand or bell-glasses, which should be put over them, after the cuttings have been well watered, and closely shut down, drawing the earth round the rim of the glasses to exclude the air; the glasses should be shaded with mats every day when the sun is hot. With this management the cuttings will put out roots in five or six weeks, and will begin to shoot above; then the glasses should be gently raised on one side to admit the air to them, and so gradually harden the plants to the open air, to prevent their drawing up weak. When these have made good roots, they should be carefully removed, and planted in an east border at about eight or nine inches asunder, observing to shade and water them until they have taken new root; after which they will require no other care, but to keep them clean from weeds till the autumn, when they may be transplanted into the borders of the pleasure-garden, where they are designed to flower.

The roots, whose stalks are thus cut down, will put out many heads or offsets, which may be divided when they have proper strength, and treated as the former; by this method, a supply of plants for the flower-garden may be always obtained.

These plants are very subject to canker and rot when they are planted in a light rich soil, but in strong ground I have seen them thrive and flower in the utmost perfection, where the stems of flowers have been as large, and the flowers as fair as the finest double Stock-gilliflowers. Their season of flowering is in *June*; I have frequently raised young plants from the stalks after the flowers have decayed, by cutting them in lengths, and planting them in the manner before directed; but these seldom make so good plants as the young cuttings, nor are they so certain to grow, therefore the other method is to be preferred.

The fourth sort grows naturally in *Hungary*. This is much cultivated in the gardens abroad, for the great fragrancy of its flowers, which in the evening is so strong, as to perfume the air to a great distance, especially where there are any number of the plants. The ladies in *Germany* are very fond of this plant, and during the season of their flowering, have the pots placed in their apartments every evening, that they may enjoy the fragrancy of their flowers; for they have but little beauty, being smaller than those of the garden Rocket, and of a pale colour, but the scent of their flowers is much preferable to them; though in the day time, if the weather is clear, they have very little odour; but when the sun leaves them, their fragrancy is expanded to a great distance. To this species it is supposed that the title of Dame's Violet was first applied.

This sort is very rarely seen in the *English* gardens: I suppose it has been neglected, because the flowers make no appearance. It is a biennial plant, like the garden Rocket, which is propagated by seeds in the same manner; but the plants are not quite so hardy, and are very subject to rot in winter, especially on a moist soil, or in rich land, where they are apt to grow very rank, so are soon injured by wet and cold in the winter; therefore the plants of this sort should be planted in a dry poor soil, and a warm situation; and if some of them are planted in pots to be placed under a common frame in winter, where they may be sheltered from hard rains and frost, and enjoy the free air at all times when the weather is mild, it will be a sure way to preserve them.

The leaves of this sort are much larger, of a paler green than those of the garden Rocket; the stalks are closely set with bristly hairs, the flowers grow in loose panicles at the top of the stalk, and appear about the same time with the garden Rocket.

The seeds of the fifth sort were sent me from *Germany* without any title, nor any account of the country from whence it came; but as it was sent with the seeds of some *Siberian* plants, I suppose this came from the same country. This is a biennial plant, which rises with a strong branching stalk three feet high, which is hairy, garnished with oblong heart-shaped leaves, ending in acute points, sitting close to the stalk, and are slightly indented on their edges; the upper part of the stalk divides into many branches, garnished with small leaves of the same shape with those below, and are terminated with loose panicles of single, large, purple flowers, of great fragrancy.

The sixth sort grows naturally in the warm parts of *Europe*. This is annual; the stalks rise about eight or nine inches high, branching out greatly on every side in a confused order, garnished with small, narrow, indented leaves, and are terminated by clusters of small yellow flowers, which make no appearance.

The seventh sort grows naturally in *Sicily*. This is an annual plant, which seldom rises more than six inches high; the stalk branches toward the top into three or four smaller, which are terminated by small white flowers.

The eighth sort grows naturally in *Africa*. This is an annual plant, with a very branching stalk, which rises about nine inches high, garnished with rough spear-shaped leaves, sawed on their edges, terminated by loose panicles of small purple flowers, which appear in *June* and *July*, which are succeeded by long pods sitting close to the stalks, filled with small seeds, which ripen in *September*.

These three sorts are rarely cultivated, except in botanick gardens, for the sake of variety. If the seeds of these are permitted to scatter, the plants will come up without care, and only require to be kept clean from weeds; or they may be sown either in the spring or the autumn where they are to stand, for they do not bear transplanting well.

The ninth sort is an annual plant, which grows naturally in the south of *France*. This sends out several heart-shaped hairy leaves from the root, which spread on the ground; the stalk rises nine inches high, branching toward the top, garnished with leaves of the same shape, which embrace the stalks with their base; the flowers are produced in loose panicles at the end of the branches, of a lively purple colour. If these seeds are sown in the autumn, they succeed much better than in the spring.

The tenth sort is a native of the same country as the former. It is a biennial plant, which rises with a branching stalk about a foot high, garnished with narrow smooth leaves, ending in acute points, indented on their edges: the flowers are produced toward the end of the branches; they are small, and of a worn-out purple colour, so make but little appearance. This is propagated by seeds, in the same way as the first sort.

HEUCHERA. *Lin. Gen. Plant.* 283. Sanicle.

The Characters are,

The flower is composed of five narrow petals, which are inserted in the border of the empalement. It hath five stamina, which are much longer than the empalement, and a roundish bifid germen, which afterward turns to an oval-pointed capsule, with two horns, which are reflexed, having two cells filled with very small seeds.

We have but one Species of this genus, viz.

HEUCHERA. *Hort. Cliff.* 82. American Sanicle, with a dirty purple flower.

This plant grows naturally in *Virginia*. It hath a peren-

nial root, which sends out many heart-shaped oval leaves, indented into four or five lobes, crenated on their edges, of a lucid green, and smooth; from between these come out the foot-stalks of the flower, which are naked, and rise a foot high, dividing at the top into a loose panicle, sustaining many small hairy flowers, of an obsolete purple colour. This flowers in *May*, and the seeds ripen in *August*.

It is propagated by parting of the roots in autumn, and should be planted in a shady situation; there is little beauty in this plant, but it is preserved for the sake of variety.

HIBISCUS. *Lin. Gen. Plant.* 756. Syrian Mallow.

The Characters are,

The flower hath a double permanent empalement; the outer hath eight or ten narrow leaves, the inner is of one leaf, cut at the brim into five acute points. It hath five heart-shaped petals, which join at their base into one; and many stamina, which are joined in form of a column, but expand toward the top. It has a round germen, which afterward turns to a capsule with five cells, opening in five parts, inclosing kidney-shaped seeds.

The Species are,

1. HIBISCUS foliis ovato-lanceolatis, supernè inciso-ferratis, caule arboreo. *Hort. Cliff.* 350. Hibiscus with oval spear-shaped leaves, whose upper parts are cut and sawed, and a tree-like stalk; commonly called *Althea frutex*.

2. HIBISCUS foliis cordato quinquangularis osolete ferratis, caule arboreo. *Hort. Upsal.* 205. Hibiscus with heart shaped leaves, having five angles, which are bluntly sawed, and a tree-like stalk; commonly called *China Rose*.

3. HIBISCUS foliis subpeltato-cordatis septemangularibus, ferratis hispida Hort. Cliff. 349. Hibiscus with heart-shaped target leaves, having seven angles, which are sawed, and set with prickly hairs; commonly called *Musk*.

4. HIBISCUS foliis palmato digitatis quinquepartitis, laciniis supernè dentatis, caule lævi. Hibiscus with fingered leaves, which are divided into five parts, indented toward the top, and a smooth stalk.

5. HIBISCUS foliis cordatis angulatis serratis tomentosis, caule arboreo. Hibiscus with angular, heart-shaped, sawed, woolly leaves, and a tree-like stalk.

6. HIBISCUS foliis cordatis integerrimis. *Flor. Zeyl.* 258. Hibiscus with entire heart-shaped leaves.

7. HIBISCUS foliis ovatis acuminatis ferratis glabris, caule arboreo. *Flor. Zeyl.* 260. Hibiscus with oval, pointed, sawed, smooth leaves, and a tree-like stalk.

8. HIBISCUS foliis ferratis, inferioribus ovatis indivisis, superioribus quinquepartitis, caule aculeato. Hibiscus with sawed leaves, the lower oval and undivided, the upper divided into five parts, and a prickly stalk.

9. HIBISCUS foliis ferratis, inferioribus cordatis, mediis tripartitis, summis quinquepartitis, caule aculeato. Hibiscus with sawed leaves, the lower ones being heart-shaped, the middle divided into three parts, the upper into five, and a prickly stalk.

10. HIBISCUS foliis quinquelobatis ferratis, caule glabro. Hibiscus with sawed leaves divided into five lobes, and a smooth stalk.

11. HIBISCUS foliis quinquifido-palmatis, caule aculeato. *Hort. Cliff.* 498. Hibiscus with hand-shaped five-pointed leaves, and a prickly stalk.

12. HIBISCUS foliis quinquepartitis, lobis ovato-lanceolatis hirsutis crenatis, caule spinosissimo. Hibiscus with leaves divided into five lobes, which are oval, spear-shaped, hairy, and crenated, and a very prickly stalk.

13. HIBISCUS foliis cordatis hirsutis crenatis, floribus lateralibus, caule arboreo ramoso. Hibiscus with heart-shaped, hairy, crenated leaves, flowers growing from the sides of the branches, and a tree-like branching stalk.

14. HIBISCUS foliis oblongo-cordatis glabris, denticulatis, subtus incanis, floribus amplissimis. Hibiscus with oblong, heart-

heart-shaped, smooth, indented leaves, hoary on their under side, and very large flowers.

15. *HIBISCUS foliis quinquepartito pedatis, calycibus inferioribus latere rumpentibus. Lin. Sp. Plant. 696.* Hibiscus with leaves like a foot, divided into five parts, and the lower empalement torn sideways.

16. *HIBISCUS foliis inferioribus cordatis angulatis, superioribus subbasatis, floribus subnutantibus, pistillo cernuo. Lin. Sp. Plant. 697.* Hibiscus with lower leaves, heart-shaped and angular, the upper ones somewhat spear-shaped, nodding flowers, and a recurved pistil.

17. *HIBISCUS foliis ovatis acuminatis serratis, caule simplicissimo, petiolis floriferis. Hort. Upsal. 205.* Hibiscus with oval, pointed, sawed leaves, a single stalk, and flowering foot-stalks.

18. *HIBISCUS caule herbaceo simplicissimo, foliis ovatis subtrilobis, subtus tomentosus, floribus axillaribus. Lin. Sp. Plant. 693.* Hibiscus with a single herbaceous stalk, oval leaves, having three lobes, woolly on their under side.

19. *HIBISCUS foliis tripartitis incisus, calycibus inflatis. Hort. Upsal. 206.* Hibiscus with tripartite cut leaves, and a bladdery empalement.

20. *HIBISCUS foliis tripartitis dentatis, lobis angustioribus caule hirsuto calycibus inflatis.* Hibiscus with tripartite indented leaves, having narrower lobes, a hairy stalk, and bladdery empalements.

21. *HIBISCUS foliis inferioribus trilobis, summis quinquepartitis obtusis crenatis calycibus inflatis, caule hispido.* Hibiscus with under leaves having three lobes, the upper ones being cut into five obtuse segments, which are crenated, swollen empalements, and a prickly stalk.

22. *HIBISCUS foliis cordatis-crenatis, angulis lateralibus extimis parvis, caule arboreo. Hort. Cliff. 349.* Hibiscus with heart-shaped crenated leaves, whose outward lateral angles are small, and a tree-like stalk.

The first sort is commonly called *Althæa frutex* by nursery gardeners, who propagate the shrubs for sale; of this there are four or five varieties, which differ in the colour of their flowers; the most common hath pale purple flowers with dark bottoms, another hath bright purple flowers with black bottoms, a third hath white flowers with purple bottoms, a fourth variegated flowers with dark bottoms; there are also two with variegated leaves, which are by some much esteemed.

These shrubs grow naturally in *Syria*, they are great ornaments in the autumn season to a garden. They rise with shrubby stalks to the height of eight or ten feet, sending out many woody branches, covered with a smooth gray bark, garnished with oval spear-shaped leaves, whose upper parts are frequently divided into three lobes. The flowers come out from the wings of the stalks at every joint of the same year's shoot, they are large, and shaped like those of the Mallow, having five large roundish petals, which join at their base, but spread open at the top, in shape of an open bell; these appear in *August*, and, if the season is not too warm, there will be a succession of flowers part of *September*, and are succeeded by short capsules with five cells, filled with kidney-shaped seeds; but unless the season proves warm, they will not ripen in this country.

These plants are generally propagated by laying down the young branches in the spring, which in one year will take root, so may be cut off from the old plants, and planted in a nursery, at three feet distance row from row, and one foot asunder in the rows; where they may remain two or three years to get strength, and then may be transplanted to the places where they are to remain. But when good seeds can be procured, the plants which are raised from them, will grow larger and more upright than those which are propagated by layers. The several varieties may

be propagated by grafting upon each other, which is the common method of propagating the sorts with striped leaves.

The second sort grows naturally in *India*, from whence the *French* first carried the seeds to their settlements in the *West-Indies*, and the inhabitants of the *British* colonies have been supplied with the seeds from them, so have given it the title of *Martinico Rose*, of this there are the double and single flowering; the seeds of the double frequently produce plants with single flowers, but the seeds of the single seldom vary to the double. The flowers of these plants alter in their colour; at their first opening they are white, then they change to a blush Rose colour, and as they decay turn to a purple. In the *West-Indies*, all these alterations happen the same day, as I suppose the flowers in those hot countries are not of longer duration, but in *England*, where the flowers last longer in beauty, the changes are not so sudden.

This plant hath a soft spongy stem, which, by age, becomes ligneous and pithy. It rises to the height of twelve or fourteen feet, sending out branches toward the top, which are hairy, garnished with heart-shaped leaves, cut into five acute angles on their borders, and are slightly sawed on their edges, of a lucid green on their upper side, but pale below. The flowers are produced from the wings of the leaves; the single one is composed of five large petals, which spread open, and are first white, but afterward change in the manner before-mentioned; these are succeeded by short, thick, blunt capsules, which are very hairy, having five cells, which contain many small kidney-shaped seeds, having a fine plume of fibrous down adhering to them.

It is propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a moderate hot bed, where they must be shaded till they have taken new root; then they must be treated as other plants from warm countries, but not too tenderly, for these require a large share of air in warm weather, otherwise they will draw up very weak; they will bear the open air in summer, in a warm sheltered situation, and will live through the winter in a very good green-house, provided they have not too much wet, but the plants thus hardily treated, will not make so great progress, nor flower so well as with a little additional warmth in winter; and if they are too tenderly managed, they will draw up weak, so will be less likely to flower. This sort flowers at different times of the year, as in its native country.

The third sort grows naturally in the *West-Indies*, where it is commonly known by the title of *Musk*; the *French* cultivate great quantities of these plants in their *American* islands, the seeds of which are annually sent to *France*, so that they certainly have some way of rendering it useful, as it seems to be a considerable branch of their trade. This rises with an herbaceous stalk about three or four feet high, sending out two or three side branches, garnished with large leaves cut into six or seven angles, which are acute, sawed on their edges, have long foot-stalks, and are placed alternately. The stalks and leaves of this are very hairy. The flowers come out from the wings of the leaves upon pretty long foot-stalks, which stand erect; they are large, of a sulphur colour, with dark purple bottoms, and are succeeded by pyramidal five-cornered capsules, which open in five cells, filled with large kidney-shaped seeds of a very musky odour.

This sort seldom lives more than two years in *England*, but in its native country continues much longer. It is propagated by seeds, which, if sown on a good hot-bed in the spring, and the plants afterward planted in pots, and

plunged into a fresh hot-bed, treating them afterward in the same way as the *Amaranthus*, to bring them forward, they will flower in *July*, and their seeds will ripen in autumn.

The fourth sort grows naturally in both the *Indies*; this rises with an herbaceous smooth stalk three or four feet high, garnished with leaves divided into five segments, almost to the bottom, which are indented at their extremities, having long foot-stalks. The flowers are produced from the wings of the leaves toward the top, standing on short foot-stalks; they are composed of five large sulphur-coloured petals, which, when open, spread five inches wide, and have a dark purple bottom, with a column of stamina and styles rising in the center; they are succeeded by large, pyramidal, five-cornered seed vessels, opening in five cells, which are filled with pretty large kidney-shaped seeds, which have little smell or taste.

It is propagated by seeds in the same manner as the former sort, and if so managed, will produce flowers and perfect seeds the same season, but the plants may be continued through the winter in a moderate warmth.

The fifth sort grows naturally in the *West-Indies*, where it rises with a woody stalk seven or eight feet high, sending out many side branches toward the top, covered with a whitish bark, garnished with angular heart-shaped leaves, which are woolly. The flowers are produced from the wings of the leaves, upon long foot-stalks; they are composed of five roundish petals, which are joined at their base, of a yellow colour, turning to red as they decay; these are succeeded by large, obtuse, five cornered, hairy seed vessels, which open in five cells filled with large kidney-shaped seeds.

This is propagated by seeds, which must be sown upon a hot-bed in the spring, and the plants afterward treated in the same way as the two last mentioned, during the first summer, but in autumn they must be plunged into the tan-bed in the stove, where they should constantly remain, and be treated in the same way as other tender plants from the same country; the second year the plants will flower, but they have not as yet perfected seeds in *England*.

The sixth sort grows naturally in both *Indies*; this rises with a woody pithy stem eight or ten feet high, dividing into several branches toward the top, which are covered with a woolly down, garnished with round heart-shaped leaves, ending in acute points; they are of a lucid green on their upper side, and hoary on their under, full of large veins, and are placed alternately on the stalks. The flowers are produced at the end of the branches, in loose spikes; they are of a whitish yellow colour, and are succeeded by short acuminate capsules, opening in five cells, filled with large kidney-shaped seeds.

This sort is propagated in the same way, and the plants require the same treatment as the fifth; they flower the second year, provided they are brought forward, otherwise they will not flower before the third or fourth season, but they will bear the open air in summer, in a warm situation, though they will not make great progress there.

The seventh sort grows naturally on the coast of *Malabar*; this rises with a woody stalk twelve or fourteen feet high, dividing into many small branches toward the top, garnished with oval sawed leaves, ending in acute points, of a lucid green above, but pale on their under side, placed without order. The flowers come out from the side of the branches, at the wings of the leaves, on pretty long foot stalks; they are composed of many oblong roundish petals of a red colour, which expand like the *Rose*, the flowers being as large when fully blown, as the common red *Rose*, and as double. This is a perennial plant, which is propagated by cuttings; the plants must constantly be kept in the tan-bed in the stove, giving them a large share of air in warm weather,

and but little water in winter. The flowers of these plants are used by the ladies in *India* to colour their hair and eyebrows black, and by the men to black their shoes. It is from this use called *Shoe-flower*.

The eighth sort is an annual plant, which rises with an upright stalk seven or eight feet high; the lower leaves are oval, serrated, and entire, but the upper leaves are divided almost to the foot-stalk, into five spear-shaped segments, like the fingers of a hand, standing on very long foot-stalks, having thorns at their base. The flowers come out from the wings of the stalks, they are large, of a pale sulphur colour, with a purple bottom, and are succeeded by oval, acuminate, prickly capsules, which open in five cells, filled with large kidney-shaped seeds.

This sort is propagated by seeds, which must be sown upon a hot-bed, and the plants treated in the same way as the third sort.

The ninth sort is near of kin to the eighth, but the stalks do not grow so tall, the lower leaves are heart-shaped and entire, the middle leaves are divided into three, and the upper into five segments, almost to the foot-stalks; they are sawed on their edges, and the stalk is prickly. The flowers come out from the wings of the stalks, they are of a very pale sulphur colour, with dark bottoms, but are not so large as those of the last.

This is propagated by seeds in the same way as the eighth, and the plants require the same treatment.

The bark of both these plants is full of strong fibres, which I have been informed the inhabitants of the *Malabar* coast prepare, and make into a strong cordage; and by what I have observed it may be wrought into fine strong thread of any size, if properly manufactured.

The tenth sort grows naturally in the *West-Indies*, where the inhabitants use the green pods to add an acid taste to their viands: there are two varieties of this, one with a light green, and the other a deep red pod, which always maintain their difference, but as there is no other difference but that of the colour of their pods, they do not deserve separate titles. This rises with an herbaceous stem about four feet high, sending out a few lateral branches, garnished with smooth leaves, divided into three or five lobes. The flowers come out from the side of the branches, they are of a dirty white, with dark purple bottoms, and are succeeded by obtuse seed vessels divided into five cells, which are filled with kidney-shaped seeds.

This sort is propagated in the same way as the third, and will flower and perfect seeds the same year, so is seldom preserved longer in *England*.

The eleventh sort is a native of *Ceylon*; this rises with an herbaceous stalk which is prickly, from two to three feet high, dividing upward into small branches, garnished with hand-shaped leaves, divided into five parts. The flowers come out from the wings of the leaves, they are small, white, with purple bottoms, and are succeeded by short obtuse capsules with five cells filled with kidney-shaped seeds.

This plant is annual, so must be treated in the same way as the third.

The twelfth sort is also annual with us; this rises with an herbaceous stalk three feet high, which hath prickly hairs, and divides into branches upwards, garnished with hand-shaped leaves, divided into five spear-shaped lobes, ending in acute points, crenated on their edges, standing upon very long foot stalks; the flowers come out from the wings of the leaves, they are very like those of the third, and the plants must be treated the same way.

The thirteenth sort grows naturally in the island of *Cuba*. This rises with a woody stalk twelve or fourteen feet high, sending out many lateral branches, garnished with hairy, heart-

heart-shaped leaves, crenated on their edges; the flowers come out single from the wings of the leaves; they are of a very bright yellow colour, but not so large as either of the former sorts, and are succeeded by short capsules ending in acute points, divided into five cells, which are filled with kidney-shaped seeds. This plant requires the same treatment as the fifth, and other tender kinds.

The fourteenth sort hath a perennial root, but an annual stalk. This rises with several stalks from the root, which grow four feet high, garnished with oblong, heart-shaped, smooth leaves, ending in acute points, of a light green on their upper side, but hoary on their under, and are slightly indented on their edges; the flowers are produced on the top of the stalks, they are very large, of a light purple colour with dark bottoms, and are succeeded by short capsules divided into five cells, filled with kidney-shaped seeds.

This is propagated by seeds, which must be sown on a moderate hot-bed in the spring, and when the plants are fit to remove, they should be each planted in a separate pot, and plunged into a hot-bed, treating them in the same way as the other tender sorts, but allowing them a greater share of air in warm weather; those plants which flowered in the *Chelsea* garden, were plunged into a tan-bed whose heat was declining, under a deep frame, where they produced plenty of flowers, but they came too late to ripen seeds. The stalks decay in the autumn, but if the pots are sheltered from frost in winter under a hot-bed frame, they will continue several years, and put out new stalks in the spring.

The fifteenth sort is very common in the *West-Indies*, where the inhabitants cultivate it for the pods or seed-vessels, which they gather green to put into their soups; these, having a soft viscous juice, add a thickness to their soups, and renders them very palatable; it is called *Ocra*. It rises with a soft herbaceous stalk three or four feet high, dividing upward into many branches, garnished with hand-shaped leaves, divided into five parts; the flowers are produced from the wings of the stalk, they are of a pale sulphur colour, with dark purple bottoms, but are smaller than either of the other sorts, and of very short duration, opening in the morning with the rising sun, but fade long before noon in warm weather. These are succeeded by capsules of very different forms, in the different varieties; in some the capsules are not thicker than a man's finger, and five or six inches long; in others they are very thick, and not more than two or three inches long; in some plants they grow erect, in others they are rather reclined; and these varieties are constant, for I have many years cultivated these plants, and have not found them vary.

This sort is propagated by seeds in the same way as the third, and the plants require the same treatment, for they are too tender to thrive in the open air in this country; I have often transplanted the plants into warm borders, after they have acquired proper strength, and have sometimes in very warm seasons had them thrive for a short time, but the first cold bad weather their leaves have all dropped off, and then they have decayed gradually, so that they have but rarely flowered, and have never in the best seasons perfected their seeds in the open air; therefore those who are inclined to cultivate these plants, must constantly shelter them in bad weather.

The sixteenth sort grows naturally near *Venice*, in moist land. This hath a perennial root and an annual stalk, which rises three or four feet high; the lower leaves are angular and heart-shaped, but the upper are spear-shaped, and slightly indented on their edges; the flowers are produced from the wings of the leaves, upon long foot-stalks; they are of a purple colour, with a dark bottom, and are

succeeded by five-cornered compressed capsules, filled with kidney-shaped seeds.

This sort is propagated by seeds, which must be sown on a hot-bed, and the plants should be treated in the same way as the fourteenth sort, otherwise they will not flower; for although the roots will live in the full ground here, yet the summers are not warm enough to bring them to flower.

The seventeenth sort grows naturally in *North America*. This hath a perennial root and an annual stalk; the roots of this sort will live in the full ground, but unless the summer is warm, the flowers seldom open. It rises with single stalks from the root two or three feet high; the leaves are oval and sawed, the flowers are large and purple.

The eighteenth sort grows naturally in *North America*, in moist ground. This hath a perennial root and an annual stalk like the former, which is herbaceous and never branches; the leaves are oval, with three lobes which are not deeply divided: they are of a bright green on their upper side, but of an Ash colour on their under; the flowers are produced from the wings of the stalk; they are large, of a bright purple colour. This sort, like the former, seldom flowers in the open air here, unless the summer proves very warm; but the roots will live in the full ground, if they are planted in a sheltered situation.

The nineteenth sort is an annual plant, which grows naturally in some parts of *Italy*, and has been long cultivated in the *English* gardens by the title of *Venice Mallow*. *Gerard* and *Parkinson* title it *Alcea Veneta*, and *Flos Hora*, or Flower of an Hour, from the short duration of its flowers, which in hot weather continue but few hours open; however, there is a succession of flowers which open daily for a considerable time, so that a few of these plants may be allowed a place in every curious garden.

It rises with a branching stalk a foot and a half high; the leaves are divided into three lobes, which are deeply jagged almost to the midrib; these jags are opposite, and the segments are obtuse; the flowers come out at the joints of the stalks upon pretty long foot-stalks, having a double empalement, the outer being composed of ten long narrow leaves, which join at their base; the inner is of one thin leaf, swollen like a bladder, cut into five acute segments at the top, having many longitudinal purple ribs, and is hairy; both these are permanent, and inclose the capsule after the flower is past. The flower is composed of five obtuse petals, which spread open at the top, the lower part forming an open bell-shaped flower; these are of a sulphur colour, with dark purple bottoms, the stamina and apices are joined in a column; after the flower is past, the germen turns to a blunt capsule opening in five cells, which are filled with small kidney-shaped seeds. This sort is propagated by seeds, which should be sown where the plants are designed to remain. These require no other culture but to keep them clean from weeds, and thin them where they are too close; if the seeds are permitted to scatter, the plants will come up full as well as when sown, so that it will maintain its situation, unless it is weeded out.

The twentieth sort grows naturally at the *Cape of Good Hope*; this is also an annual plant which resembles the former, but the stalks grow more erect, are of a purplish colour; and very hairy; the leaves are composed of three narrow lobes, which are divided almost to the foot-stalk, the middle lobe stretching out more than twice the length of the two side ones; the flowers are larger and their colour deeper, than those of the other.

The twenty-first sort grows naturally at the *Cape of Good Hope*. This is an annual plant, having at first sight some resemblance of the sorts before-mentioned; but it has strong, hairy, branching stalks, garnished with much

broader leaves than either of the former, the lower being divided into three, and the upper into five obtuse lobes, which are crenated on their edges; the flowers are large, but of a paler colour than those of the other.

All these are as hardy as the nineteenth sort, so may be treated in the same way.

The twenty-second sort grows naturally at *Campeachy*; this differs so essentially from the other species in its fructification, as to deserve another title, for all the other have dry capsules with five cells, including many kidney-shaped seeds, but this hath a soft viscous berry, with a hard shell inclosed, containing five roundish seeds: it rises with a shrubby stalk ten or twelve feet high, dividing into many branches, garnished with smooth, heart-shaped, angular leaves, which are crenated on their edges; the flowers comes out from the wings of the stalks singly, standing on short foot-stalks; they are composed of five oblong petals, which are twisted together and never expand; they are of a fine scarlet, and are succeeded by roundish berries of a scarlet colour when ripe, inclosing a hard shell which opens in five cells, each containing a single roundish seed.

This sort is generally propagated here by cuttings, because the seeds do not often ripen in *England*; if the cuttings are planted in pots, and plunged into a gentle hot-bed, keeping the air from them, they will soon take root, and should be gradually inured to bear the open air. The plants require a moderate stove to preserve them through the winter, and if they are kept in warmth in summer, they will flower, and sometimes ripen fruit, though they may be placed abroad in a sheltered situation for two or three months in summer, but the plants so treated seldom flower.

HIERACIUM. *Lin. Gen. Plant.* 818. Hawkweed.

The Characters are,

It hath a flower composed of many hermaphrodite florets, included in one common scaly empalement; the florets are equal and uniform; they have one petal shaped like a tongue, indented in five parts at the point; they have each five short hairy stamina. At the bottom of the petal is situated the germen, which afterward becomes a short four-cornered seed crowned with down, sitting in the empalement.

There are a great number of species of this genus, many of which grow naturally as weeds in *England*, therefore I shall only select those which are best worth cultivating, for to enumerate all the species would swell this work greatly beyond its intended bulk.

1. *HIERACIUM foliis oblongo-ovatis dentatis tomentosis, caule erecto ramoso lanuginoso.* Hawkweed with oblong, oval, woolly, indented leaves, and an erect branching stalk covered with down; or Woolly Mountain Hawkweed.

2. *HIERACIUM caule ramoso, foliis radicalibus ovatis dentatis, caulino minori.* *Hort. Cliff.* 388. Hawkweed with a branching stalk, whose lower leaves are oval and indented, and those on the stalks smaller.

3. *HIERACIUM foliis integris, caule subnudo simplicissimo piloso corymbifero.* *Hort. Cliff.* 388. Hawkweed with entire leaves, and a single, hairy, naked stalk, terminated by a corymbus of flowers.

4. *HIERACIUM foliis radicalibus obovatis denticulatis, caulibus oblongis semiamplexicaulibus.* *Prod. Leyd.* 124. Hawkweed with oval indented leaves at the root, those on the stalks oblong, and half embracing them.

5. *HIERACIUM foliis lanceolatis amplexicaulibus dentatis, floribus solitariis, calycibus laxis.* *Hort. Cliff.* 387. Hawkweed with spear-shaped indented leaves embracing the stalks, flowers growing singly, and loose empalements.

6. *HIERACIUM foliis amplexicaulibus cordatis subdentatis, pedunculis unifloris hirsutis, caule ramoso.* *Hort. Cliff.* 387. Hawkweed with heart-shaped indented leaves embracing the stalks, hairy foot-stalks bearing one flower, and a branching stalk.

The first sort grows naturally on the *Appennine* mountains; this sends out from the root many oblong, oval, indented, woolly leaves; from between these arise a branching stalk, little more than a foot high, covered over with a woolly down, garnished with downy leaves of the same shape as the lower, but smaller, these fit very close to the stalks; the flowers are produced singly at the end of each branch, they are large, of a bright yellow, composed of many florets, which are succeeded by four-cornered, oblong, black seeds, crowned with a white down. The flowers appear by the beginning of *June*, and the seeds ripen in about five or six weeks after, but there is frequently a succession of flowers till the autumn.

It is propagated by seeds, which should be sown in an east aspected border in *March*; and when the plants are strong enough to remove, they should be transplanted to a shady border of undunged ground, at six inches distance, observing to water them if the weather should prove dry, till they have taken new root; after which, if they are kept clean from weeds, they will require no other culture: in the autumn they should be transplanted where they are designed to remain, the following summer they will flower and produce ripe seeds; the roots will continue two years if they are not planted in a rich or moist soil, which frequently occasions their rotting in winter.

The second sort hath very hairy, oval, indented leaves; the stalks rise about the same height as the former, branching into several divisions, which are each terminated by a large, single, yellow flower, of the shape of the former. This flowers in *June*, and the seeds ripen in *August*; it grows naturally in some places in the north of *England*; it is a perennial plant, and may be propagated in the same manner as the former sort.

The third sort grows naturally in *Syria*, but has been long an inhabitant of the *English* gardens, where it is cultivated for its fine purple flowers. This was formerly known by the title of Grim the Collier, which was probably given it from the dark colour of the empalement.

This hath a perennial fibrous root, which sends out many oblong, oval, entire leaves, between which arises a single stalk near a foot high, which is naked toward the bottom, and terminated by a corymbus of gold-coloured flowers, which appear in succession from the beginning of *June* to *September*, and are succeeded by seeds crowned with down, which ripen in *August* and *September*. This sort sends out many offsets from the root, by which it is easily propagated, or it may be raised from seeds in the same manner as the first sort: the best time to transplant them is the autumn. This will thrive in any soil or situation.

The fourth sort grows naturally on the *Pyrenean* mountains. It is a perennial plant, whose lower leaves are oval, indented, and of a grayish colour; those on the stalks are smaller, but of the same shape and colour, and half embrace the stalks with their base; the stalks rise a foot high, branching into several divisions, each being terminated by one young flower. This is propagated by seeds as the first sort.

The fifth sort also grows on the *Pyrenees*; this hath a perennial root, which sends up several erect stalks, garnished with spear-shaped leaves which are indented, and embrace the stalks with their base; the flowers are produced from the wings of the stalks, upon short foot-stalks, each sustaining one large yellow flower. This flowers in *June*, but seldom perfects seeds here, so is propagated by parting of the roots in autumn; it will thrive in any situation.

The sixth sort rises with a branching stalk a foot and a half high, garnished with heart-shaped leaves which are indented at their base, where they embrace the stalks; each division of the branches terminate in a hairy foot-stalk, sustaining

taining one large yellow flower, which appears in *May*, and the seeds ripen in *July*. This is a perennial plant, which is propagated by seeds as the first sort, and requires the same treatment.

HIPPOCASTANUM. See *Æsculus*.

HIPPOCRATEA. *Lin. Gen. Plant.* 1098.

The Characters are,

It hath a large spreading empalement of one leaf, cut into five segments; the flower hath one oval petal which is entire; it hath six slender short stamina, and an oval germen situated below the petal, which afterward becomes an oblong capsule winged at the top, inclosing a single seed.

We have but one Species of this genus, viz.

HIPPOCRATEA fructu trigemino subrotundo, caule volubili. Hippocratea with a triple roundish fruit, and a twining stalk.

The seeds of this plant were brought from *Campeachy*, and several of the plants were raised in *England*, which continued two years in several gardens, but none of them lived to flower; they grew to the height of eight or ten feet, twining round stakes, but their stalks are very slender, and decayed at the bottom, probably from their having too much wet.

It is a very tender plant, so must be constantly kept in the bark-bed in the stove, and should have but little wet in winter.

HIPPOCREPIS. *Lin. Gen. Plant.* 791. Horseshoe Vetch.

The Characters are,

The empalement of the flower is permanent, divided into five parts, the flower is of the butterfly kind; it hath ten stamina, nine joined and one separate, and an oblong narrow germen, sitting on an awl-shaped style, which afterward becomes a long, plain, compressed pod, cut into many parts from the under seam to the upper, each part forming a roundish sinus with obtuse three cornered joints, connected to the upper seam, each joint being shaped like a horseshoe, inclosing a single seed.

The Species are,

1. HIPPOCREPIS leguminibus sessilibus solitariis. *Hort. Cliff.* 364. Horseshoe Vetch, with single pods sitting close to the stalk.

2. HIPPOCREPIS leguminibus pedunculatis confertis, margine exteriore repandis. *Prod. Leyd.* 384. Horseshoe Vetch, with pods growing in clusters upon foot-stalks, whose outer border is turned inward.

3. HIPPOCREPIS leguminibus pedunculatis confertis, margine altero lobatis. *Hort. Cliff.* 364. Horseshoe Vetch, with pods growing in clusters upon foot-stalks, one border of which has lobes.

The first sort grows naturally in *Italy* and *Spain*; this is an annual plant, which sends from the root several trailing stalks a foot long, that divide upward into smaller branches, garnished with winged leaves, composed of four or five pair of small lobes, terminated by an odd one; these are obtuse, and indented at their ends; from the wings of the stalk come out single flowers of the butterfly kind, which are yellow, and are succeeded by single pods sitting close to the stalks, which are about two inches long, and a third of an inch broad, bending inward like a sickle, and divided into many joints shaped like a horseshoe: this flowers in *June* and *July*, and the seeds ripen in the autumn, soon after which the plants decay.

The second sort is found growing naturally in some parts of *England*, upon chalky hills; this is a smaller plant than the former, and hath a perennial root, sending out slender trailing stalks about ten inches long, which are garnished with narrow winged leaves; the flowers grow in clusters on the top of long foot-stalks, which are succeeded by shorter pods twisted inward in roundish curves, but have joints shaped like those of the former sort.

The third sort grows naturally in the south of *France*,

Germany, and *Italy*. This is an annual plant with trailing stalks, greatly resembling the first, but the flowers are produced in clusters on the top of pretty long foot-stalks; they are shaped like those of the other sorts, and the pods are jointed in like manner, but the joints are fixed to the opposite border. These plants flower in *June* and *July*, and the seeds ripen in *August* and *September*.

These are propagated by seeds, which should be sown in the autumn, where the plants are designed to remain; and when the plants come up, they must be kept clean from weeds, and thinned where they are too close, which is all the culture they require. The two annual sorts will decay in the autumn, after they have perfected their seeds, but the roots of the other will continue two or three years, provided they are not in too good ground.

HIPPOLAPATHUM. See *Rumex*.

HIPPOMANE. *Lin. Gen. Plant.* 1099. The Manchincel.

The Characters are,

It hath male and female flowers in the same spike; the male flowers come out in small clusters, from a short cup-shaped empalement, and have no petals; the female flowers have no petal, but an oval germen, which afterward becomes a roundish fruit with a fleshy cover, inclosing a rough hard shell with several cells, each inclosing one seed.

The Species are,

1. HIPPOMANE foliis ovatis serratis. *Hort. Cliff.* 484. Hippomane with oval sawed leaves.

2. HIPPOMANE foliis ovato-oblongis serratis, basi glandulosis. *Lin. Sp. Plant.* 1191. Hippomane with oval oblong leaves which are sawed, and have glands at their base.

3. HIPPOMANE foliis subovatis dentato-spinosis. *Lin. Sp. Plant.* 1191. Hippomane with oval leaves, which have prickly indentures.

The first sort grows naturally in most of the islands in the *West-Indies*; it is a very large tree in its native soil, almost equalling the Oak in size; the wood is much esteemed for making of cabinets, book-cases, &c. being very durable, and taking a fine polish; it is also said, that the worms will not eat it: but as the trees abound with a milky caustick juice, so before they are felled, they make fires round their trunks to burn out their juice, otherwise those who fell them, would be in danger of losing their sight, by the juice flying in their eyes; for where-ever this falls on the skin, it will raise blisters; and if it comes upon linen it will immediately turn it black, and on being washed will come in holes: it is also dangerous working of the wood after it is sawn out, for if any of the saw-dust happens to get into the workmens eyes, it causes inflammations, and the loss of sight for some time; to prevent which, they generally cover their faces with fine lawn, during the time they are working the wood.

This tree hath a smooth brownish bark, the trunk divides upward into many branches, garnished with oblong leaves, ending in acute points, slightly sawed on their edges, and are of a lucid green, standing on short foot-stalks. The flowers come out in short spikes at the end of the branches, being of both sexes in the same spike, but having no petals they make but little appearance; these are succeeded by fruit about the size and of the same shape as the Golden Pippin, turning of a yellow colour when ripe, which has often tempted strangers to eat of them to their cost, for they inflame the mouth and throat to a great degree, causing violent pains in the throat and stomach, which is dangerous, unless remedies are timely applied.

The inhabitants of *America* believe it is dangerous to sit or lie under these trees, and affirm, that the rain, or dew, which falls from the leaves, will raise blisters; but it is very certain, that unless the leaves are broken, and the juice of them mix with the rain, it will do no injury.

The second sort grows naturally at *Carthagena*, in *New-Spain*, and the third at *Campeachy*. The second sort grows to as large a size as the first; the leaves of this are much longer than those of the first, and have two small glandules growing at their base; they are sawed on their edges, and are of a lucid green.

The third sort is of humbler growth, seldom rising more than twenty feet high; the leaves of this greatly resemble those of the common Holly, and are set with sharp prickles at the end of each indenture; they are of a lucid green, and continue all the year.

These plants are preserved in some of the curious gardens in *Europe*, where they can never be expected to rise to any great height, for they are too tender to live in these northern countries, but in stoves; they rise easily from seeds, provided they are good. The seeds must be sown upon a good hot-bed, and when the plants come up, they should be each planted in a small separate pot, and plunged into a good bed of tanners bark, treating them in the same way as other tender plants, but they must not have much wet, for these plants abound with an acrid milky juice, and it is certain that such plants are soon killed by much moisture; these plants must be removed into the stove; and plunged into the tan-bed in autumn, where they should constantly remain, giving them very little water in winter; and in summer when the weather is warm, they should have a good share of air admitted to them, and gently refreshed with water.

HIPPOPHAE. *Lin. Gen. Plant.* 980. Sea Buckthorn.

The Characters are,

It is male and female in different plants; the male flowers have an empalement of one leaf, cut into two parts; they have no petals, but have four short stamina. The female flowers have no petals, but a one-leaved empalement, which is oval and bifid at the brim; these have no stamina, but in the center is situated a small roundish germen, which afterward turns to a globular berry with one cell, inclosing one roundish seed.

The Species are,

1. **HIPPOPHAE foliis lanceolatis.** *Lin. Sp. Plant.* 1023. Hippophae with spear-shaped leaves, or Sea Buckthorn with a Willow leaf.

2. **HIPPOPHAE foliis ovatis.** *Lin. Sp. Plant.* 1024. Hippophae with oval leaves, called *Canada* Sea Buckthorn.

The first sort grows naturally on the sea banks in *Lincolnshire*, and also on the sand banks between *Sandwich* and *Deal*, in *Kent*; there are two varieties of this, one with yellow, and the other with red fruit, but it is the first only which I have observed growing naturally in *England*, the other I saw growing on the sand banks in *Holland*.

These rise with shrubby stalks eight or ten feet high, sending out many irregular branches, which have a brown bark silvered over, garnished with very narrow spear-shaped leaves, of a dark green on their upper side, but hoary on their under, having a prominent midrib; the two borders of the leaves are reflexed like the *Rosemary*; the flowers come out from the side of the younger branches, to which they sit very close. The male flowers growing in small clusters, but the female come out singly; these make but little appearance. They appear in *July*, and the berries on the female plants are ripe in autumn.

This sort is easily propagated by suckers from the root, for the roots spread wide, and send up a great number of shoots, so as to form a thicket; if these are taken off in autumn, and transplanted into a nursery, they will be fit to transplant after one year's growth, to the places where they are to remain; as there is little beauty in this plant, so one or two of them may be allowed a place in a plantation of shrubs for the sake of variety.

The second sort grows naturally in *North America*; this hath much the appearance of the former sort, but the leaves

differ in their shape, these being much shorter and broader, and are not so white on their under side; this may be easily propagated by suckers or layers.

HIPPOSELINUM. See *Smyrnum*.

HIRUNDINARIA. See *Aclepias*.

HOLCUS. *Lin. Gen. Plant.* 1015. *Indian Millet*, or *Corn*.

The Characters are,

It hath male and hermaphrodite flowers on the same plant; the male flowers are small, and have a twisted bivalve chaff, ending with an acute beard; they have neither petals, or any proper empalement, but have three hairy stamina. The hermaphrodite flowers are single, sitting in a stiff bivalve chaff; they have three hairy stamina with a roundish germen, which afterward becomes an oval single seed wrapped up in the chaff.

The Species are,

1. **HOLCUS glumis villosis, seminibus aristatis.** *Hort. Upsal.* 301. Holcus with hairy chaff, and bearded seeds.

2. **HOLCUS glumis glabris, seminibus muticis.** *Lin. Sp. Plant.* 1047. Holcus with smooth husks, and seeds without awns.

There are several other of the grassy tribe which belong to this genus, but as they are not cultivated for use, so I shall not enumerate them here.

The two sorts here mentioned, grow naturally in *India*, where their grain is often used to feed poultry, and the seeds of these are frequently sent to *Europe* for the same purpose, but the summers are seldom warm enough to ripen the seeds in the open air in *England*. The stalks of these plants rise five or six feet high, with strong reedy stalks, like those of the *Maize*, or *Turkey Wheat*. The leaves are long and broad, having a deep furrow through the center of the leaf, where the midrib is depressed on the upper surface, and is very prominent below. The leaves are two feet and a half long, and three inches broad in the middle, embracing the stalks with their base. The flowers come out in large panicles at the top of the stalks, resembling, at first appearance, the male spikes of the *Turkey Wheat*; these are succeeded by roundish seeds, which are wrapped round with the chaff.

These plants are propagated in a few gardens for the sake of variety, but as they are late in ripening their grain here, so they are not worth cultivating for use. The seeds should be sown on a warm border the beginning of *April*, and when the plants come up, they should be thinned to the distance of a foot asunder in the rows, and the rows should be three feet distance; the culture after this, is to keep the ground clean from weeds, and draw the earth up with a hoe to the stems of the plants; if the season proves warm, their panicles will appear in *July*, and the grain will ripen in *September*, but in bad seasons their grain will not ripen here.

HOLLOW ROOT. See *Fumaria*.

HOLLY. See *Ilex*.

HOLLYHOCKS. See *Alcea*.

HONEYSUCKLE. See *Periclymenum*.

HOPS. See *Lupulus*.

HORDEUM. *Lin. Gen. Plant.* 94. *Barley*.

The Characters are,

It hath a partial involucre, which contains three flowers; the petal of the flower opens with two valves; the flower hath three hairy stamina shorter than the petal, and an oval turned germen, which afterward becomes an oblong bellied seed, pointed at both ends, having a longitudinal furrow, surrounded by the petal of the flower, which does not fall off.

The Species are,

1. **HORDEUM flosculis omnibus hermaphroditis aristatis ordinibus duobus erectioribus.** *Lin. Sp. Plant.* 84. Barley with all the flowers hermaphrodite, and two orders of beards, which are erect; or *Spring Barley*.

2. **HORDEUM flosculis lateralibus masculis muticis, seminibus angularibus imbricatis.** *Hort. Upsal.* 23. Barley with male flowers

flowers on the side, without awns, and angular seeds placed over each other; or common long-eared Barley.

3. *HORDEUM flosculus lateralibus masculis muticis, seminibus angularibus patentibus corticatis. Hort. Upsal. 23.* Barley with male flowers on the side, without awns, and angular spreading seeds with husks; commonly called Sprat, or Battledore Barley.

4. *HORDEUM flosculus omnibus hermaphroditis aristatis, seminibus sexfariam aequaliter positis. Hort. Upsal. 23.* Barley with all the flowers hermaphrodite and bearded, and six rows of seeds equally ranged; called Winter, or Square Barley, Bear Barley, or Big.

The first sort is the common Spring Barley, which is principally cultivated in *England*; of this the farmers make two sorts, *viz.* the common and Rath-ripe Barley, which are the same; for the Rath-ripe has only been an alteration occasioned by being long cultivated upon warm gravelly lands. The seeds of this, when sown in cold or strong land, will, the first year, ripen near a fortnight earlier than the seeds taken from strong land, therefore the farmers in the vales, generally purchase their seed Barley from the warm land, for if saved in the vales two or three years, it will become full as late in ripening as the common Barley of their own product, and the farmers on the warm land are also obliged to procure their seed Barley from the strong land, otherwise their grain would degenerate in bulk and fulness, which by thus changing is prevented. This sort of Barley is easily distinguished by the two orders of beards, or awns, which stand erect; the chaff is also thinner than that of the two last species, so is esteemed better for malting.

The second sort is the long-eared Barley, which is cultivated in many parts of *England*, and is an exceeding good sort, but some farmers object to this sort, because they say the ears being long and heavy, it is more apt to lodge; this hath the grains regularly ranged in a double row, lying over each other like tiles on a house, or the scales of fish. The husk, or chaff of this Barley is also very thin, so is much esteemed for malting.

The third sort is usually called Sprat Barley; this hath shorter and broader ears than either of the other sorts; the awns, or beards, are longer, and the grains are placed closer together, the awns being long, the birds cannot so easily get out the grains; this seldom grows so tall as the other species, the straw is shorter and coarser, so not very good fodder for cattle.

The fourth sort is rarely cultivated in the southern parts of *England*, but in the northern counties, and in *Scotland* is generally sown, being much hardier than the other species, so will bear the cold; this hath its grains disposed in six rows; the grain is large and plump, but is not so good for malting, which is the reason of its not being cultivated in the southern parts of *England*, where the other sorts which are much better for that purpose do thrive so well.

All the sorts of Barley are sown in the spring of the year, in a dry time; in some very dry light land it is sown early in *March*, but, in strong clayey soils, it is not sown till *April*, and sometimes not until the beginning of *May*; but when it is sown so late, if the season doth not prove very favourable, it is very late in autumn before it is fit to mow, unless it be the Rath-ripe sort, which is often ripe in nine weeks from the time of sowing.

Some people sow Barley upon land where Wheat grew the former year, but when this is practised, the ground should be ploughed the beginning of *October* in a dry time, laying it in small ridges, that the frost may mellow it the better, and this will improve the land greatly; and if this can be ploughed again in *January*, or the beginning of *February*, it will break and prepare the ground better; in *March* the ground should be ploughed again deeper, and laid even where it is not very wet; but in strong wet lands the ground

should be laid in round lands, and the furrows made deep to receive the wet. When this is finished, the common method is to sow the Barley seed with a broad cast at two sowings; the first being harrowed in once, the second is harrowed until the seed is buried; the common allowance of seed is four bushels to an acre.

This is the quantity of grain usually sown by the farmers, but if they could be prevailed on to alter this practice, they would soon find their account in it, for if a third of that quantity is sown, there will be a much greater produce, and the corn will be less liable to lodge, as I have many times experienced; for when corn or any other vegetable stands very close, the stalks are drawn up weak, so are incapable to resist the force of winds, or bear up under heavy rains; but when they are at a proper distance, their stalks will be more than twice the size of the other, so are seldom laid. I have frequently observed in fields where there has been a foot-path through their middle, that the corn which has stood thin on each side the path hath stood upright, when all the rest on both sides has been laid flat on the ground; and whoever will observe these roots of corn near the paths, will find them tiller out (*i. e.* have a greater number of stalks) to more than four times the quantity of the other parts of the field. I have seen experiments made by sowing Barley in rows a-crofs divers parts of the same field, and the grains sowed thin in the rows, so that the roots were three or four inches asunder in the rows, and the rows a foot distance; the intermediate spaces of the same field were at the same time sown broad cast in the usual way; the success was this, the roots which stood thin in the rows tillered out from ten or twelve, to upward of thirty stalks on each root, the stalks were stronger, the ears longer, and the grains larger than any of those sown in the common way; and when those parts of the field where the corn was sown in the usual way has been lodged, these parts sown thin have supported their upright position against wind and rain, though the rows have been made not only lengthways, but crofs the lands, in several positions, so that there could be no alteration in regard to the goodness of the land, or the situation of the corn; therefore where such experiments have been frequently made, and always attended with equal success, there can be no room to doubt which of the two methods is more eligible, since if the crops were only supposed to be equal in both, the saving two thirds of the corn sown, is a very great advantage, and deserves a national consideration, as such a saving, in scarce times, might be a very great benefit to the public. This saving of seed corn must be understood to regard such as is sown broad cast; for if it is sown in drills, an eighth part of the seeds usually sown will be sufficient for an acre of land, and the produce will be greater; for all sorts of corn is naturally inclined to send out several stalks from each root, which they rarely fail to do where the roots are at a proper distance and have room; nor do the stalks grow in this case near so tall, but are much stronger than when they are near together, when they rarely have more than two or three stalks, whereas those roots which have proper room, seldom have less than ten or twelve. I have had eighty-six stalks upon one root of Barley, which were strong, produced longer ears, and the grain was better filled than any which I ever saw grow in the common method of husbandry, and the land upon which this grew was not very rich; but I have frequently observed on the sides of hot-beds in the kitchen-gardens, where Barley straw has been used for covering the beds, that some of the grains left in the ears has dropped out and grown, the roots have produced from thirty to sixty stalks each, and those have been three or four times larger than the stalks ever arrive at in the common way; but to this I know it will be objected, that although upon rich land in a garden, these roots of corn

may probably have so many stalks, yet in poor land they will not have such produce; therefore unless there is a greater quantity of seeds sown, their crop will not be worth standing, which is one of the greatest fallacies that can be imagined; for to suppose that poor land can nourish more than twice the number of roots in the same space as rich land, is such an absurdity, as one could hardly suppose any person of common understanding guilty of; and yet so it is, for the general practice is to allow a greater quantity of seed to poor land, than for richer ground, not considering that where the roots stand so close, they will deprive each other of the nourishment, so starve themselves, which is always the case where the roots stand close, which any person may at first sight observe in any part of the fields where the corn happens to scatter when they are sowing it; or in places, where, by harrowing, the seed is drawn in heaps, those patches will starve, and never grow to a third part of the size as the other parts of the same field; and yet common as this is, it is little noticed by farmers, otherwise they surely would not continue their old custom of sowing. I have made many experiments for several years in the poorest land, and have always found that all crops which are sown or planted at a greater distance than usual, have succeeded best upon such land; and I am convinced if the farmers could be prevailed on to quit their prejudices, and make trial of this method of sowing their corn thin, they would soon see the advantage of this husbandry.

The noblemen and gentlemen in *France* are very busy in setting examples of this husbandry in most of their provinces, being convinced by many trials of its great utility, and it were to be wished the same was done in *England*.

After the Barley is sown, and harrowed in, the ground should be rolled after the first shower of rain, to break the clods and lay the earth smooth; which will render it better to mow the Barley, and also cause the earth to lie closer to the roots of the corn, which will be of great service to it in dry weather.

Where Barley is sown upon new broken up land, the usual method is, to plough up the land in *March*, and let it lie fallow until *June*, at which time it is ploughed again, and sown with Turneps, which are eaten by sheep in winter, by whose dung the land is greatly improved, and then in *March* following the ground is ploughed again, and sown with Barley as before.

There are many people who sow Clover with their Barley, and some have sown the Lucern with Barley; but neither of these methods is to be commended, for where there is a good crop of Barley, the Clover or Lucern must be so weak as not to pay for standing, so that the better way is to sow the Barley alone without any other crop among it, and then the land will be at liberty for any other crop, when the Barley is taken off the ground; but this practice of sowing Clover, Rye Grass, and other Grass seeds, with corn, has been so long and universally established among farmers, that there is little hope of prevailing with those people to alter a custom which has been handed down to them from their predecessors, although there should be many examples produced to shew the absurdity of this practice.

When the Barley has been up three weeks or a month, it will be a very good method to roll it over with a weighty roller, which will press the earth close to the roots of the corn, and thereby prevent the sun and air from penetrating the ground, which will be of singular service in dry seasons; and this rolling of it before it stalks, will cause it to till out into a greater number of stalks; so that if the plants should be thin, this will cause them to spread so as to fill the ground, and likewise strengthen the stalks.

The time for cutting of Barley is, when the red colour of the ears is off, and the straw turns yellow, and the ears

begin to hang down: in the north of *England* they always reap their Barley, and make it up in sheaves, as is practised here for Wheat, by which method they do not lose near so much corn, and it is also more handy to stack; but this method cannot so well be practised where there are many weeds amongst the corn, which is too frequently the case in the rich lands near *London*, especially in moist seasons; therefore when this is the case, the Barley must lie on the sward till all the weeds are dead; but as it is apt to sprout in wet weather, it must be shook up, and turned every fair day after rain to prevent it. When it is carried, it should be thoroughly dry, otherwise if it be stacked wet, it will turn musty; or if too green, it is subject to burn in the mow. The common produce of Barley is two and a half, or three quarters on an acre, but I have sometimes known eight or ten quarters on an acre.

HORMINUM. *Tourn. Inst. R. H.* 178. Clary.

The Characters are,

The empalement of the flower is permanent, of one leaf, having two lips; the upper ending in three acute points, the under ending in two. The flower has one petal, divided into two lips; the upper is concave, and incurved with a slight indenture at the point, the lower is broader and more indented. It hath two short stamina situated in the tube of the flower. In the bottom of the tube are four roundish germen, which afterward become four seeds, lodged in the empalement.

The Species are,

1. HORMINUM *foliis sinuatis obtusis crenatis, calycibus acutis*. Clary with obtuse sinuated leaves which are crenated, and the empalement ending in acute points; called Wild Clary.

2. HORMINUM *foliis pinnato-sinuatis rugosis, calycibus corollâ longioribus*. Clary with wing-shaped sinuated leaves which are rough, and the empalements longer than the petal of the flower; or, Oak-leaved Clary.

3. HORMINUM *foliis cordatis crenato-dentatis, verticillis subnudis, stylo corollarum labio inferiore incumbente*. Clary with heart-shaped, crenated, indented leaves, naked whorls, and the style lying upon the under lip of the petal.

4. HORMINUM *foliis radicalibus pinnato-incisis, caulibus cordatis crenatis, summis semiamplexicaulibus*. Clary with lower leaves cut and winged, those on the stalks heart-shaped and crenated, and those on the top half embracing the stalks.

5. HORMINUM *foliis obtusis crenatis, bracteis summis sterilibus majoribus coloratis*. Clary with obtuse crenated leaves, and the bractæ on the top of the stalks, large, coloured, and barren; Clary with a purple-violet top.

The first sort grows naturally on sandy and gravelly grounds in many parts of *England*, so is rarely cultivated in gardens; but as it has been long used in medicine, I have enumerated it to introduce the other species.

This is sometimes called *Oculus Christi*, from the supposed virtues of its seeds in clearing of the sight, which it does by its viscous covering; for when any thing happens to fall into the eye, if one of the seeds is put in at one corner, and the eye-lid kept close over it, moving the seed gently along the eye, whatever happens to be there will stick to the seed, and so be brought out. The virtues of this are supposed to be the same as the garden Clary, but not quite so powerful.

The second sort grows naturally in the south of *France* and *Italy*. This is by some supposed to be a variety of the first; but the leaves of this are regularly sinuated on both sides, in form of a winged leaf; the stalks rise about the same height with the former, but all the leaves upon the stalks are sinuated in the same manner as the lower; the flowers are smaller than those of the first, but grow in whorled spikes like them. It is a perennial plant, very hardy, and will propagate in plenty by its scattered seeds.

The third sort is a perennial plant, which grows naturally in *Austria* and *Bohemia*. This sends out from the root a great number of heart-shaped leaves, which are sawed on their edges and deeply veined, standing upon pretty long foot-stalks which are hairy; the stalks are square, and grow two feet and a half high, garnished with two heart-shaped leaves at each joint, whose base half embraces the stalks, which are garnished with whorls of small blue flowers, not much unlike those of the common sort, but larger; the spikes are more than a foot long, and toward the top the whorls are nearer together.

The fourth sort grows naturally in the south of *France*, and in *Italy*. This is also a perennial plant, which has some resemblance of the third, but the lower leaves of this are cut at their base to the midrib, into one or two pair of ears or lobes, which are small, and at a distance from each other; the leaves are not sawed, but bluntly indented; the stalks of this are slenderer, and do not grow so tall as those of the third, nor are the spikes of flowers so long.

Both these sorts may be easily propagated by seeds, which, if sown in the spring on an open spot of ground, the plants will come up, and require no other care but to keep them clean from weeds, and allow them room to grow; for they should not be nearer than two feet apart, as they grow very large, and will last several years.

The fifth sort is an annual plant, which grows naturally in *Spain*; of this there are three varieties which are constant, one with purple tops, another with red tops, and a third with green tops. As they differ in nothing but the colour of their bractææ on the top of the stalks, so I have not put them down as different species, though from more than thirty years cultivating them, I have not known them alter from one to the other.

These plants have obtuse crenated leaves, shaped like those of the common red Sage; the stalks are square and grow erect, about a foot and a half high; their lower parts are garnished at each joint, with two opposite leaves of the same shape, but gradually diminishing in size toward the top: the stalks are garnished upward with whorls of small flowers, and are terminated by clusters of small leaves, which in one are red, in another blue, and a third green, which make a pretty appearance, and are preserved in gardens for ornament.

The seeds of these are sown in the spring, in the places where they are designed to remain, and require no other care but to keep them clean from weeds, and thin them where they come up too close.

Garden Clary. See *Sclarea*.

HORNBEAM. See *Carpinus*.

HORSE CHESTNUT. See *Æsculus*.

HORSE-DUNG is of great use in gardens, first to make hot-beds for the raising of all sorts of early garden crops, as Cucumbers, Melons, Asparagus, Sallading, &c. for which purpose no other sort of dung will do so well, this fermenting the strongest; and, if mixed with litter, and sea-coal ashes in a due proportion, will continue its heat much longer than any other sort of dung whatsoever; and afterwards when rotted, becomes an excellent manure for most sorts of lands, more especially for such as are of a cold nature; and for stiff clayey lands, when mixed with sea-coal ashes, and the cleansing of *London* streets, it will cause the parts to separate much sooner than any other compost will do; so that where it can be obtained in plenty, I would always recommend the use of it for such lands.

HOT-BEDS are of general use in these northern parts of *Europe*, without which we could not enjoy so many of the products of warmer climes as we do now; nor could we have the tables furnished with the several products of the garden, during the winter and spring months, as they are at present in most parts of *England*, better than in any other

country in *Europe*; for although we cannot boast of the clemency of our climate, yet the *London* markets and noblemen's tables are better furnished with all sorts of esculent plants, much earlier in the season, and in greater quantities, than any of our neighbours, which is owing to our skill in hot-beds.

The ordinary hot-beds which are commonly used in the kitchen gardens, are made with new horse-dung, in the following manner:

1st, There is a quantity of new horse-dung from the stable (in which there should be part of the litter or straw which is commonly used in the stable, but not in too great proportion to the dung,) the quantity of this mixture must be according to the length of the bed intended; which, if early in the year, should not be less than one good load for each light; this dung should be thrown up in a heap, mixing therewith some sea-coal ashes, which will be of service to continue the heat of the dung; it should remain six or seven days in this heap, then it should be turned over, and the parts well mixed together, and cast into a heap again, where it may continue five or six days longer, by which time it will have acquired a due heat; then in some well sheltered part of the garden, a trench should be dug out in length and width proportionable to the frames intended for it; if the ground is dry, about a foot, or a foot and a half deep; but if wet, not above six inches; then the dung should be wheeled into the opening, and every part of it stirred with a fork, to lay it exactly even and smooth through every part of the bed; as also to lay the bottom of the heap (which has commonly less litter) upon the surface of the bed; this will prevent the steam from rising so plentifully as it would otherwise do. To prevent this, and the heat from rising so violently as to burn the roots of whatever plants are put into the ground, it will be a very good way to spread a layer of neat's dung all over the surface of the horse-dung, which will prevent the mould from burning: if the bed is intended for Cucumbers or Melons, the earth should not be laid all over the bed at first, only a hill of earth should be first laid in the middle of each light, on which the plants should be planted, and the remaining space should be filled up from time to time, as the roots of the plants spread, but this is fully explained under those two articles. But if the hot-bed is intended for other plants, then after the bed is well prepared, it should be left two or three days for the steam to pass off before the earth is laid upon the dung.

In the making of these hot-beds, it must be carefully observed to settle the dung close with a fork; and if it be pretty full of long litter, it should be equally trod down close in every part, otherwise it will be subject to heat too violently, and consequently the heat will be much sooner spent, which is one of the greatest dangers these sort of beds are liable to. During the first week or ten days after the bed is made, the glasses should be but slightly covered in the night, and in the day time they should be raised to let out the steam, which is subject to rise very copiously while the dung is fresh; but as the heat abates, so the covering should be increased.

But although the hot-bed I have described is what the kitchen-gardeners commonly use, yet those made with tanners bark are much preferable, especially for all tender exotick plants or fruits, which require an even degree of warmth to be continued for several months, which is what cannot be effected by horse-dung only: the manner of making these beds is as follows:

There must be a trench dug in the earth about three feet deep, if the ground be dry; but if wet, it must not be above six inches deep at most, and must be raised in proportion above ground, so as to admit of the tan being laid three feet thick. The length must be proportioned to the frames

intended to cover it, but that should never be less than eleven or twelve feet, and the width not less than six, which is but a sufficient body to continue the heat. This trench should be bricked up round the sides to the above-mentioned height of three feet, and should be filled with fresh tanners bark (*i. e.* such as the tanners have lately drawn out of their vats, after they have used it for tanning leather) which should be laid in a round heap for a week or ten days before it is put into the trench, that the moisture may the better drain out of it, which, if detained in too great a quantity, will prevent its fermentation; then put it into the trench, and gently beat it down equally with a dung fork; but it must not be trodden, which would also prevent its heating, by settling it too close; then you must put on the frame over the bed, covering it with the glasses, and in about a fortnight it will begin to heat; at which time may be plunged pots of plants or seeds into it, observing not to tread down the bark in doing of it.

HOTTONIA. *Boerb. Ind. alt. 1. p. 207.* Water Violet.

The Characters are,

The flower has one petal, cut above into five oblong oval segments; it hath five short awl-shaped stamina, standing on the tube of the petal. In the center is situated a globular germen, which afterward becomes a capsule of the same form with one cell, filled with globular seeds, sitting upon the empalement.

We know but one Species of this genus, *viz.*

HOTTONIA. *Boerb. Ind. alt. 1. p. 207.* Water Milfoil, or Water Violet, with a naked stalk.

This plant grows naturally in standing waters, in many parts of *England*; the leaves which are for the most part immersed in the water, are finely winged and flat, like most of the sea plants, and at the bottom have long fibrous roots, which strike into the mud; the flower-stalks rise five or six inches above the water, they are naked, and toward the top have two or three whorls of purple flowers, terminated by a small cluster of the same. These flowers have the appearance of those of the Stock-gilliflower, so make a pretty appearance on the surface of the water.

It may be propagated in deep standing waters, by procuring its seeds when they are ripe, from the places of their natural growth; which should be immediately dropped into the water where they are designed to grow, and the spring following they will appear; and if they are not disturbed, they will soon propagate themselves in great plenty.

HOEING is necessary and beneficial to plants, for two things: first, for destroying of weeds; 2dly, because it disposes the ground the better to imbibe the night dews, keeps in a constant freshness, and adds a vigour to the plants and trees, whose fruit by that means, becomes better conditioned than otherwise it would be.

HUMULUS. See *Lupulus*.

HURA. *Lin. Gen. Plant. 965.* Sand Box tree.

The Characters are,

It hath male and female flowers on the same plant. The male flowers have no petal, but a column of stamina, which are joined at bottom into a cylinder. The female flowers have a swelling empalement of one leaf, with one tubulous petal; the roundish germen is situated in the bottom of the empalement, which afterward becomes an orbicular ligneous fruit, depressed at top and bottom, having twelve deep furrows, with so many cells, which open at the top with an elasticity, each containing one round flat seed.

We know but one Species of this genus, *viz.*

HURA. *Hort. Cliff. 486.* Commonly called in the *West-Indies* Sand Box tree.

This grows naturally in the *Spanish West-Indies*, from whence it has been introduced into the *British* colonies of *America*, where some of the plants are preserved for their

shade, and by some for curiosity. It rises with a soft ligneous stem to the height of twenty-four feet, dividing into many branches, which abound with a milky juice, and have scars on their bark, where the leaves have fallen off. The branches are garnished with heart-shaped leaves, those which are the biggest are eleven inches long, and nine inches broad in the middle, indented on their edges, having a prominent midrib, with several transverse veins from that to the sides, which are alternate. The male flowers come out from between the leaves, upon foot-stalks which are three inches long; these are formed into a close spike, or column, lying over each other like the scales of fish. The female flowers are situated at a distance from the male; these have a swelling cylindrical empalement, out of which arises the petal of the flower, which hath a long funnel-shaped tube, spreading at the top, where it is divided into twelve parts, which are reflexed. After the flower is past, the germen swells and becomes a round, compressed, ligneous capsule, having twelve deep furrows, each being a distinct cell, containing one large, round, compressed seed; when the pods are ripe, they burst with an elasticity, and throw out their seeds to a considerable distance.

It is propagated by seeds, which should be sown in pots, and plunged into a hot-bed of tanners-bark. If the seeds are fresh, the plants will appear in about five weeks after the seeds are sown. As the plants will advance very fast, where due care is taken of them, so they should have a large share of fresh air admitted to them in warm weather, otherwise they will draw up too weak. When the plants are about two inches high, they should be transplanted each into a separate small pot, and plunged again into the hot-bed of tanners bark, and shaded from the sun, until they have taken new root, after which they must have free air admitted to them, by raising the glasses in proportion to the warmth of the season. In this hot-bed they should remain till *Michaelmas*, provided the plants have room to grow, without touching of the glasses, at which time they must be removed into the bark-shove, and plunged in the warmest part thereof: during the winter season they must be sparingly watered, for as the plants have succulent stalks, abounding with a milky juice, so much moisture will rot them. In summer they must have a large share of fresh air in warm weather, but should not be removed into the open air, for they are too tender to live abroad in the warmest part of the year in this country.

As this plant has ample leaves, which are of a beautiful green colour, it makes an agreeable variety among other tender exotick plants in the stove; for where they are kept warm and duly refreshed with water, they retain their leaves all the year in verdure.

HYACINTHUS. *Tourn. Inst. R. H. 344. tab. 180.* Hyacinth.

The Characters are,

The flower has no empalement. It has one bell-shaped petal, whose rim is cut into six parts, and three nectariums on the point of the germen, with six short awl-shaped stamina. In the center is situated a roundish three-cornered germen, having three furrows, which afterward becomes a roundish three-cornered capsule, having three cells, which contain roundish seeds.

The Species are,

1. **HYACINTHUS** *corollis campanulatis sexpartitis apice revolutis.* *Hort. Cliff. 125.* Hyacinth with bell-shaped petals, divided into six parts, which are reflexed at their tops; *English* Hyacinth, or Hare Bells.

2. **HYACINTHUS** *corollarum exterioribus petalis distinctis, interioribus coadunatis.* *Lin. Sp. Plant. 317.* Hyacinth, whose exterior part of the flower hath distinct petals, but the interior are joined.

3. *HYACINTHUS corollis campanulatis sexpartitis, floribus utrinque dispositis.* Hyacinth with bell-shaped petals, which are divided into six parts, and flowers ranged on each side of the stalk.

4. *HYACINTHUS corollis campanulatis sexpartitis racemo cernuo.* *Lin Sp. Plant.* 317. Hyacinth with bell-shaped petals, which are divided into six parts, and a nodding branch of flowers.

5. *HYACINTHUS corollis campanulatis semiflexidis basi cylindricis.* *Hort. Upsal.* 85. Hyacinth with bell-shaped petals, cut half way into six parts, and a cylindrical base.

6. *HYACINTHUS corollis infundibuliformibus semiflexidis basi ventricosis.* *Hort. Upsal.* 85. Hyacinth with funnel-shaped petals cut half into six parts, and swelling at the base; or early, white, eastern Hyacinth.

The sorts here mentioned are all of them distinct species, of which there are great varieties, especially of the sixth, which have been cultivated with so much art, as to render some of them the most valuable flowers of the spring; in *Holland* the gardens abound with them, especially at *Haerlem*, where the florists have raised so many varieties as to amount to some hundreds; and some of their flowers are so large, double, and finely coloured, as that their roots are valued at twenty or thirty pounds sterling each root. To enumerate these varieties here, would swell this work to very little purpose, as every year produces new kinds.

The first sort grows naturally in woods, and near hedges, in lands which have lately been woods, in many parts of *England*, so is seldom admitted into gardens; but the poor people, who make it their business to gather the wild flowers of the fields and woods for nosegays, &c. bring great quantities of these in the spring to *London*, and sell them about the streets.

There is a variety of this with white flowers, which is kept in some gardens, and only differs in the colour of their flowers from the other.

The second sort is preserved in some gardens for the sake of variety; but as it hath as little beauty as the first, so is seldom allowed a place in the flower-garden. The flowers of this are narrower than those of the first sort, and seem as if their petals were divided to the bottom, three of the outer segments being separated from the other, standing at a small distance from the three interiors, but they are all joined at their base; the flowers are of a light blue colour, but they fade to a worn-out purple.

The third sort grows naturally in *Spain* and *Italy*. This hath blue flowers of the open spread bell-shape, which are divided into six segments almost to the bottom, and are disposed on every side the stalk.

The fourth sort seems to be a variety of the first, the flowers being ranged for the most part upon one side of the stalk, and the top of the bunch is always bent on one side. The flowers are of a blush Peach colour, and appear about the same time as the first.

The fifth sort grows naturally in *Spain*. This hath a smaller flower than either of the former sorts, and comes earlier in the season. The petal is cut into six parts half the length, and is reflexed at the brim; the lower part is cylindrical, a little swelling at the base, and is of a deeper blue than either of the former. This was formerly called by the gardeners the *Coventry* blue Hyacinth.

The sixth sort is the eastern Hyacinth, of which we formerly had very few varieties in the *English* gardens, but the single and double white and blue flowering; but from the seeds of these there has been many others raised in *England*; but the gardeners in *Holland* have, within the last fifty years, raised so many fine varieties, as to render the former sorts of no value.

Those who are desirous to preserve any of the old sorts,

need not be at much trouble about it, for their roots propagate in great plenty in any soil or situation, and will require no other care but to take up their roots every other year, soon after their leaves decay, and plant them again in autumn; for if they are permitted to remain longer in the ground, their roots will have multiplied to so great a degree, as to render their flowers very small and weak.

All the different sorts of Hyacinths are propagated by seeds or offsets from the old bulbs; the former method has been but little practised in *England* till very lately, but in *Holland* and *Flanders* it hath been followed for many years, whereby they have obtained so great a variety of most beautiful flowers. Few florists in *England* think it worth their trouble to wait four or five years for the flowers of a plant, which when produced perhaps might not deserve to be preserved; but they do not consider, that it is only the loss of the four or five first years after sowing; for if they continue sowing every year after they begin, there will be a succession of flowers annually, which will constantly produce some sorts different from what they are before possessed of; and new flowers being always the most valuable to skilful florists (provided they have good properties to recommend them), it will always be a sufficient recompence for the trouble and loss of time.

The method of raising these flowers from seeds is as follows: first, to be provided with some good seed (which should be saved from either semi-double, or such single flowers as are large, and have good properties): secondly, one or more shallow boxes or pots should be provided, which must be filled with fresh, light, sandy soil, laying the surface very level; then the seeds should be sown thereon as equally as possible, covering it about half an inch thick with the same light earth: the time for this work is about the middle of *August*. These boxes or pots should be placed where they may enjoy the morning sun only until the latter end of *September*, at which time they should be removed into a warmer situation, and towards the end of *October* they should be placed under a common hot-bed frame, where they may remain during the winter and spring months, to be protected from hard frosts; but they should be exposed to the open air when the weather is mild, by taking off the glasses. In *February* or *March* the young plants will begin to appear above ground, at which time they must be carefully screened from frosts, otherwise they will be destroyed when they are so young; but they must not be covered at that season except in the night, or in very bad weather; for when the plants are come up, if they are too close covered, they will draw up tall and slender, and thereby prevent the growth of their roots. At the end of *March*, if the weather proves good, they may be removed out of the frame, placing them in a warm situation; and if the season proves dry, they should now and then have a little water, and kept very clear from weeds, which would soon overspread the tender plants and destroy them.

Towards the latter end of *April*, or the beginning of *May*, these boxes should be removed into a cooler situation; for the heat of the sun at that season would be too great for these tender plants, causing their blades to decay much sooner than they would, if they were screened from its violence. In this shady situation they should remain during the heat of summer, observing to keep them constantly clear from weeds; but you must not place them under the dripping of trees, &c. nor should you give them any water after their blades are decayed, for that would infallibly rot the roots. About the latter end of *August* you should sift a little light rich earth over the surface of the boxes, and then remove them again into a warmer situation, and treat them, during the winter, spring, and summer months, as was before directed; and the second year, about the mid-

ble of *August*, should be prepared a bed of light, rich, sandy soil, in proportion to the quantity of seedling roots, the surface of which should be very even; then take out the earth from the boxes in which the plants were raised, into a sieve, in order to get out all the roots, which by this time (if they have grown well) will be about the size of small Pease: these roots should be placed upon the bed at about three inches asunder, observing to set the bottom part of their roots downwards; then they should be covered over two inches thick with the same light earth; but as it will be impossible to get all the small roots out of the earth in the boxes, the earth should be spread upon another bed equally, and covered over with light earth, by which method none will be lost, be they ever so small.

These beds must be arched over with hoops, and in very hard frosty weather must be covered with mats, &c. to protect them from frost; and in the spring, when the green leaves are above ground, if the weather should be very dry, they should have a little water sparingly, for nothing is more injurious to these bulbs than too great quantities of moisture. During the summer season the beds must be kept clear from weeds, but after the blades are decayed, should not have any water; in autumn the surface of the bed should be stirred with a very short hand-fork, being exceeding careful not to thrust it so deep as to touch the roots, which, if hurt, are very subject to perish soon after. Then a little fresh, light, rich earth should be sifted over the bed about an inch thick, or somewhat more; in winter the bed should be covered again (as before). In this bed the roots may continue two years; the third summer, when the leaves are decayed, the roots should be carefully taken up, and may be kept out of the ground till *August*, when they should be planted into new beds prepared as before, at the distance of six inches asunder; in these beds the roots may remain till they flower, during which time they should be treated as before, with this difference only, that instead of covering them with mats in the winter, the surface of the ground should be covered with tanners bark.

When their flowers begin to shew themselves, those which have good properties should be marked, by thrusting a small stick down by each root; which root, at the time for taking them up, should be selected from the rest, and planted by themselves, though I would by no means advise the rejecting any of the other roots, until they have blown two years, before which their worth cannot be ascertained. When their roots are taken up they should be laid into the earth again in a horizontal position, leaving the green leaves hanging downwards from the roots, whereby the great moisture contained in their very succulent leaves and flower-stalks will be exhaled, and prevented from entering the roots, which, when suffered to return into them, is very often the cause of their rotting. In this position the roots should remain until the leaves are quite dried off, when they must be taken up, and after being cleared from all manner of filth, which would be hurtful to them, they must be laid up in boxes, where they may be preserved dry until *September*, which is the proper season for planting them again.

I shall now proceed to the culture of such Hyacinths as have either been obtained from *Holland*, or have been produced from seeds in *England*. The want of skill in this particular, has occasioned the ill success most people have had with them here, which has occasioned their being so much neglected, supposing their roots to degenerate after they have flowered in *England*; which is a great mistake, for were the roots managed with the same art as is practised in *Holland*, I am fully convinced they would thrive full as well as there; for, from some hundreds of roots which I have received from *Holland* at different times, I have had a

very great increase of their roots, which were as large, and produced as many flowers upon their stems, as the same sorts do in most parts of *Holland*.

The soil in which these flowers succeed best, is a light, sandy, fresh, rich loamy, which may be composed after the following manner: Take half fresh earth from a common, or pasture-land, which is of a sandy loam; this should not be taken above eight or nine inches deep at most; and if taken with the turf, or green sward with it, it will still be better, provided it has time to rot; to this should be added a fourth part of sea-sand, and the other fourth part of rotten cow-dung; these should be well mixed together, and cast into a heap, where it may remain until it is wanted, but it should be turned over once every month. If this compost be made two years before it is used, it will be much the better, but if used sooner it should be oftener turned, that the parts may the better unite.

This soil should be laid two feet deep in the beds which are designed for Hyacinths, and a little rotten cow-dung, or tanners bark, may be layed at the bottom, which will be within reach of the fibres, but should by no means touch the bulb. If the soil be very wet where these beds are made, they should be raised ten or twelve inches above the surface, but if it be dry, they need not be raised above three or four.

The best season for planting these roots is towards the middle or latter end of *September*, according to the earliness or lateness of the season, or the weather which then happens; but I would advise never to plant them when the ground is extreme dry, unless there is a prospect of some rain soon after; for if the weather should continue dry for a considerable time after, the roots will receive a mouldiness, which will certainly destroy them.

These beds will require no farther care until the frost comes on, at which time they should have some rotten tan spread over the bed, about four inches thick; and if the alleys on each side of the bed are filled up, either with rotten tan, dung, or sand, it will prevent the frost from penetrating the ground to the roots, and secure them from being destroyed; but when the winters prove very severe, it will also be proper to have some Pease haulm, or such like covering laid over them, which will keep out the frost better than mats. But this covering should be taken off whenever the weather is mild, and only continued on in very hard frosts; for where the beds are covered with tan or sea-coal ashes, no common frost can penetrate through, so the other coverings are useless, except in very severe frost. In *February*, when the leaves begin to appear, the beds must be arched over with hoops, that they may be covered either with mats, canvas, or some other light covering, to prevent the frost from injuring the buds as they arise above ground; but these coverings must be constantly taken off every day when the weather is mild, otherwise the flower-stems will be drawn up weak, and the foot-stalks of the flowers will be slender, and so rendered incapable of supporting the bells, which is a great disadvantage to the flowers. When these hoops are fixed over the beds, the rotten tan should be taken off; in the doing of which, great care should be taken not to bruise or injure the leaves of the Hyacinths which are then coming up.

When the stems of the flowers are advanced to their height, before the flowers are expanded, short sticks should be placed by each root, to which, with a wire formed into a hoop, the stem of the flowers should be fastened, to support them from falling, otherwise, when the bells are fully expanded, their weight will incline them to the ground.

During their season of flowering they should be covered in the heat of the day from the sun, and also from all heavy rains; but they should be permitted to receive gentle showers,

as also the morning and evening sun; but if the nights are frosty, they must be constantly defended therefrom. With this management the flowers may be continued in beauty at least three weeks or a month, and sometimes more, according to their strength, or the favourableness of the season.

When their flowers are quite decayed, and the tops of their leaves begin to change their colour, the roots should be lifted with a narrow spade, or some other handy instrument: in the doing of this, the instrument must be carefully thrust down by the side of the root, so as not to bruise or injure it, as also to put it below the bottom of the root; then by the forcing of this instrument on one side, the fibres of the root are raised and separated from the ground. The design of this is to prevent their receiving any more nourishment from the ground, for by imbibing too much moisture at this season, the roots frequently rot after they are taken up; about a fortnight after this operation the roots should be entirely taken out of the ground, and then the earth of the beds should be raised into a sharp ridge, laying the roots into it in a horizontal position, with their leaves hanging out, by which means a great part of the moisture contained in their thick succulent stalks and leaves will evaporate, which, if permitted to return back to the roots, would cause them to rot and decay after they are taken up, which has been the general defect of most of the Hyacinths in England.

In this position the roots should remain until the green leaves are entirely decayed, which perhaps may be in three weeks time. This is what the Dutch gardeners term, the ripening of their roots, because by this method the roots become firm, and the outer cover is smooth, and of a bright purple colour; whereas those roots which are permitted to remain undisturbed, till the leaves and stalks are quite decayed, will be large, spongy, and their outer coats will be of a pale colour, for the stems of many of these flowers are very large, and contain a great quantity of moisture, which, if suffered to return into the roots, will infallibly cause many of them to perish. After they are so ripened, they may be taken out of the ground, and wiped clean with a soft woollen cloth, taking off all the decayed parts of the leaves and fibres, putting them into open boxes where they may lie singly, and be exposed to the air, but they must be preserved carefully from moisture, nor should they be suffered to remain where the sun may shine upon them; in this manner they may be preserved out of the ground until September, which is the season for planting them again, at which time you must separate all the strong flowering roots, planting them in beds by themselves, that they may make an equal appearance in their flowers; but the offsets and smaller roots should be planted in another separate bed for one year, in which time they will acquire strength, and by the succeeding year will be as strong as the older roots.

There are some persons who let their Hyacinth roots remain two or three years unremoved, by which they have a much greater increase of roots than when they are annually taken up; but the roots by this great increase are frequently degenerated, so as to produce single flowers; therefore I should advise the taking up of the roots every year, which is the most certain method to preserve them in their greatest perfection, though the increase may not be so great; those roots which are annually removed will be rounder and firmer, than such as stand two years unremoved.

For the other sorts of Hyacinth, see Muscari and Ornithogalum.

HYACINTHUS TUBEROSUS. See Crinum.

HYDRANGÆA. Gron. Flor. Virg. 50.

The Characters are,

The flower hath a small permanent empalement of one leaf, and five roundish petals which are equal. It hath ten stamina, which

are alternately longer than the petal. Under the flower is situated a roundish germen, which afterward turns to a roundish capsule, crowned by the two horned stigmas, divided transversely into two cells, filled with small angular seeds.

We know but one Species of this genus, viz.

HYDRANGÆA. Gron. Flor. Virg. 50.

This plant grows naturally in North America, from whence it has been brought within a few years past to Europe, and is preserved in gardens for the sake of variety more than its beauty. It hath a spreading fibrous root, from which is sent up many soft, pithy, ligneous stalks, which rise about three feet high, garnished at each joint with two oblong heart-shaped leaves placed opposite; the leaves are three inches long and two broad near their base, sawed on their edges, and have many veins running from the middle upward to their borders; the flowers are produced at the top of the stalks, in form of a corymbus; they are white, composed of five petals, with ten stamina surrounding the style.

This is easily propagated by parting of the roots; the best time for this is the latter end of October, which is also the best time to transplant them: the plants should have a moist soil, for they grow naturally in marshy places; they require no other culture but to keep them clear from weeds, and dig the ground between them every winter. The roots are perennial, and if in very severe frost the stalks are killed, they will put out new ones the following spring.

HYDROCOTYLE, Water Navelwort.

This plant grows in great plenty in moist places in most parts of England, and is never cultivated for use, so I shall pass it over with only naming it.

HYDROLAPATHUM. See Rumex.

HYDROPHYLLON. Lin. Gen. Plant. 187. Water Leaf.

The Characters are,

The flower has a permanent empalement of one leaf, cut into five segments. It hath one bell-shaped petal, divided into five parts; under each of these segments is fixed a nectarium, which is situated about the middle. It hath five stamina, which are longer than the petal, and an oval-pointed germen, which afterward becomes a globular capsule with one cell, inclosing one large round seed.

We know but one Species of this genus, viz.

HYDROPHYLLON Morini. Jonq. Hort. Water Leaf of Morinus.

This plant grows naturally in Canada, and many other parts of America, on moist spongy ground. The root is composed of many strong fleshy fibres, from which arise many leaves with foot-stalks five or six inches long, jagged into three, five, or seven lobes, almost to the midrib, indented on their edges, and have several veins running from the midrib to the sides. The flowers rise with foot-stalks from the roots, having one or two small leaves of the same shape with the lower; the flowers are produced in loose clusters hanging downward, they are of a dirty white and are bell-shaped, so make no great figure.

This plant is very hardy in respect to cold, but requires a moist rich soil; for if it is planted in dry ground it will not live, unless it is constantly watered in dry weather. It may be propagated by parting of the roots, which should be done in autumn, that the plants may be well rooted before spring, otherwise they will require a great deal of water.

HYMENÆA. Lin. Gen. Plant. 1100. Locust tree.

The Characters are,

The outer involucre of the flower is divided into two parts, the inner is of one leaf indented in five parts; the flower hath five equal petals. It hath ten short declining stamina. In the center is situated an oblong germen, which afterward becomes a large oblong pod, with a thick ligneous shell, divided into several

partitions

partitions transversely, in each of which is lodged one compressed large seed, surrounded with a farinaceous pulp.

We know but one Species of this genus, viz.

HYMENÆA. Hort. Cliff. 484. commonly called Locust tree in America.

This is a very large spreading tree in the West-Indies, where it grows in great plenty; the stem is covered with a russet bark, which divides into many spreading branches, garnished with smooth stiff leaves, which stand by pairs, their base joining at the foot-stalk, to which they stand oblique, the two outer sides being rounded, and their inside strait, so that they resemble a pair of sheep-shears. The flowers are produced in loose spikes at the end of the branches, some of the short ligneous foot-stalks supporting two, and others three flowers, which are composed of five yellow petals striped with purple; the stamina are much longer than the petals, of a purplish colour; the flowers are succeeded by thick, fleshy, brown pods, shaped like those of the garden Bean, but much larger, of a purplish brown colour, and of a ligneous consistence, with a large suture on both edges; these contain three or four roundish compressed seeds, divided by transverse partitions.

The wood of this tree is esteemed a good timber in the West-Indies, and it yields a fine clear resin which is called Gum Anime in the shops, which makes an excellent varnish.

It is easily raised from the seeds if they are fresh, which should be sown in pots, and plunged into a hot-bed of tanners bark: there should be but one seed put into each pot, or if there is more, when the plants appear, they should be all drawn out but one soon after they come up, before their roots entangle, when it will be hazardous doing it; for if great care is not taken, the plant intended to be left may be drawn out with the other. As the roots of this plant are but slender, so they are very difficult to transplant; for unless a ball of earth is preserved to them, they seldom survive their removal, therefore they must be seldom transplanted from one pot to another. The plants must constantly remain in the tan-bed in the stove, and should be treated in the same way with other tender plants of the same country, giving but little water to them, especially in the winter. When these plants first appear, they make considerable progress for two or three months, after which time they are at a stand perhaps a whole year without shooting, being in their growth very like the Anacardium, or Cashew Nut, so is very difficult to preserve long in this country.

HYOSCYAMUS. Tourn. Inst. R. H. 117. tab. 42. Henbane.

The Characters are,

The flower has a cylindrical empalement of one leaf, which is permanent. It hath one funnel-shaped petal, cut into five obtuse parts, with five inclined stamina. In the center is situated a roundish germen, which afterward becomes an obtuse capsule, divided into two cells by an intermediate partition, opening with a lid at the top, to let out the many small seeds which adhere to the partition.

The Species are,

1. HYOSCYAMUS foliis amplexicaulibus. Hort. Cliff. 56. Henbane with leaves embracing the stalks; or common black Henbane.

2. HYOSCYAMUS foliis petiolatis, floribus pedunculatis terminalibus. Henbane with leaves having foot-stalks, and flowers with foot-stalks terminating the branches.

3. HYOSCYAMUS foliis petiolatis, floribus sessilibus. Hort. Upsal. 56. Henbane with leaves having foot-stalks, and flowers sitting close to the branches.

4. HYOSCYAMUS foliis lanceolatis infernè pinnato-incisis summis integerrimis. Henbane with spear-shaped leaves, the lower being cut into regular segments, and the upper ones are entire.

5. HYOSCYAMUS foliis petiolatis acutè dentatis, pistillo corollâ longiore. Henbane with acute indented leaves standing on foot-stalks, and a pointal longer than the petal of the flower.

6. HYOSCYAMUS foliis lanceolatis subdentatis, calycibus spinosis. Hort. Upsal. 44. Henbane with spear-shaped leaves somewhat indented, and a prickly empalement.

The first of these sorts is the common black Henbane, which grows wild in England upon the sides of banks and old dunghills almost every where. It is a biennial plant, with long fleshy roots, which strike deep into the ground, sending out several large soft leaves, which are deeply slashed on their edges; the following spring the stalks come out, which rise about two feet high, garnished with leaves of the same shape, but smaller, which embrace the stalks with their base; the upper part of the stalk is garnished with flowers standing on one side in a double row, sitting close to the stalks alternately; they are of a dark purplish colour with a black bottom, and are succeeded by roundish capsules, sitting within the empalement; these open with a lid at the top, and have two cells filled with small irregular seeds. This is a very poisonous plant, and should be rooted out in all places where children are suffered to come; for in the year 1729, there were three children poisoned with eating the seeds of this plant, near Tottenham Court; two of which slept two days and two nights before they could be awakened, and were with difficulty recovered; but the third being older and stronger, escaped better.

The roots of this plant are used for anodyne necklaces to hang about children's necks, being cut to pieces and strung like beads, to prevent fits and cause an easy breeding of their teeth, but they are very dangerous to use inwardly. Some years past there was a mixture of these roots brought over with Gentian, and used as such, which was attended with very bad effects, as hath been mentioned under the article of Gentian, so I shall not repeat it here.

The second sort grows naturally in the islands of the Archipelago. This hath rounded leaves, which are obtusely sinuated on their borders, and stand upon long foot-stalks; the stalks branch more than those of the first, and the flowers grow in clusters at the end of the branches, standing upon short foot-stalks; they are of a pale yellow colour, with very dark purple bottoms.

The third sort is much like the second, but the flowers are in closer bunches, sitting very close on the ends of the branches; they are of a greenish yellow colour, with green bottoms. It grows naturally in the warm parts of Europe, and is the sort whose seeds should be used in medicine, as the white Henbane of the shops.

The fourth sort grows naturally in Syria; this rises with a branching stalk two feet high, garnished with long spear-shaped leaves sitting close to the stalk; the lower leaves are regularly cut on both sides into acute segments, but the upper leaves are entire; the flowers grow at the end of the stalks in close bunches; they are of a worn-out red colour, and shaped like those of the common sort.

All these are biennial plants, which perish soon after they have perfected their seeds. They flower in June and July, and their seeds ripen in the autumn, which, if permitted to scatter, will produce plenty of the plants the following spring; or if the seeds are sown at that season, they will succeed much better than in the spring; for when they are sown in spring, the plants seldom come up the same year. They are all hardy, and require no other culture but to keep them clean from weeds, and thin the plants where they are too close. The fourth sort should have a warm situation and a dry soil, in which it will stand much better through the winter than in rich ground.

The fifth sort grows naturally in *Candia*. This is a perennial plant, with weak hairy stalks, which require support; the leaves are roundish, hairy, and acutely indented on their edges, standing upon pretty long foot-stalks; the flowers come out at each joint of the stalk; they are large, of a bright yellow, with a dark purple bottom; the style of this sort is much longer than the petal. It flowers most part of summer, but seldom ripens seeds in *England*. This sort will continue several years, if they are kept in pots and sheltered in winter, for they will not live in the open air; it only requires to be protected from frost; therefore if these plants are placed under a common hot-bed frame in winter, where they may enjoy as much free air as possible in mild weather, they will thrive better than when they are more tenderly treated. It may be easily propagated by cuttings, which, if planted in a shady border, and covered with hand-glasses in any of the summer months, they will take root in a month or six weeks, and may be afterward planted in pots, and treated like the old plants.

HYPECOUM. *Tourn. Inst. R. H. 230. tab. 115.*

The Characters are,

The flower hath four petals, and a two-leaved empalement. It hath four stamina situated between the petals. In the center is placed an oblong cylindrical germen, which afterward becomes a long, compressed, jointed pod, which is incurved, with one roundish compressed seed in each joint.

The Species are,

1. HYPECOUM *siliquis arcuatis compressis articulatis. Hort. Upsal. 31.* Hypecoum with compressed jointed pods bent inward.

2. HYPECOUM *siliquis cernuis teretibus cylindricis. Hort. Upsal. 31.* Hypecoum with taper, cylindrical, nodding pods.

3. HYPECOUM *siliquis erectis teretibus torulosis. Hort. Upsal. 32.* Hypecoum with taper, erect, wreathed pods.

The first sort hath many wing-pointed leaves, of a grayish colour, which spread near the ground, and slender branching stalks, which lie prostrate on the ground; they are naked below, but at the top are garnished with two or three small leaves of the same shape and colour with those below; from between these leaves come out the foot-stalks of the flower, each sustaining one yellow flower with four petals, and a pointal stretched out beyond the petals, which afterward turns to a jointed compressed pod about three inches long, which bends inward like a bow, having one roundish compressed seed in each joint.

The second sort hath slender stalks which stand more erect; the segments of the leaves are longer, and much narrower than those of the first; the flowers are smaller, and come out at the division of the branches, which are succeeded by narrow taper pods hanging downward.

The third sort grows in the east. This hath much the appearance of the second sort in leaf and flower, but the pods grow erect and are wreathed and twisted about.

These plants are all of them annual, so their seeds should be sown in the autumn, on a bed of fresh earth where they are to remain, for they seldom succeed when they are transplanted. When the plants are come up, they should be carefully cleared from weeds, and where they are too close they must be thinned, leaving them about six or eight inches apart; after this they will require no other culture, but to keep them constantly clear from weeds.

The juice of this plant is of a yellow colour, resembling that of *Celandine*, and is affirmed by some eminent physicians to have the same effect as opium.

HYPERICUM. *Tourn. Inst. R. H. 254. tab. 131.* St. Johnswort.

The Characters are,

The flower has a permanent empalement, divided into five oval

concave segments; it hath five oblong oval petals, and a great number of hairy stamina, joined at their base in five distinct bodies. It hath in the center a roundish germen, supporting one, three, or five styles. The germen afterward becomes a roundish capsule, having the same number of cells as there are styles in the flower, which are filled with oblong seeds.

The Species are,

1. HYPERICUM *floribus trigynis, caule ancipiti, foliis obtusis pellucido-punctatis. Hort. Cliff. 380.* St. Johnswort with three styles to the flower, and obtuse leaves having pellucid punctures; or common St. Johnswort.

2. HYPERICUM *floribus trigynis, caule quadrato herbaceo. Hort. Cliff. 380.* St. Johnswort with three styles to the flowers, and a square herbaceous stalk; or St. Johnswort with a square stalk, commonly called St. Peterwort.

3. HYPERICUM *floribus trigynis, staminibus corollâ longioribus, caule fruticoso ancipiti. Hort. Cliff. 331.* St. Johnswort with three styles to the flower, stamina longer than the petals, and a shrubby stalk looking two ways; stinking shrubby St. Johnswort.

4. HYPERICUM *floribus trigynis, calycibus obtusis, staminibus corollâ longioribus caule fruticoso.* St. Johnswort with three styles to the flower, obtuse empalements, stamina longer than the petals, and a shrubby stalk; shrubby St. Johnswort from the *Canaries*.

5. HYPERICUM *floribus trigynis, calycibus acutis, staminibus corollâ brevioribus, caule fruticoso. Hort. Cliff. 380.* St. Johnswort with three styles to the flower, acute empalements, stamina shorter than the petals, and a shrubby stalk.

6. HYPERICUM *floribus trigynis, calycibus obtusis, staminibus corollâ longioribus, capsulis, coloratis, caule fruticoso.* St. Johnswort with three styles to the flower, obtuse empalements, stamina longer than the petals, coloured seed vessels, and a shrubby stalk.

7. HYPERICUM *floribus pentagynis, caule tetragono herbaceo simplici, foliis lævibus integerrimis. Hort. Upsal. 236.* St. Johnswort with five styles to the flower, a square, single, herbaceous stalk, and smooth entire leaves.

8. HYPERICUM *floribus pentagynis, caule fruticoso, foliis ramisque cicatrifatis. Lin. Sp. Plant. 783.* St. Johnswort with five styles to the flower, a shrubby stalk, and scarified leaves and branches.

9. HYPERICUM *floribus trigynis, fructu baccato, caule fruticoso ancipiti. Hort. Upsal. 237.* St. Johnswort with three styles to the flower, a fleshy seed vessel, and a shrubby stalk looking two ways; common Tutsan, or Park Leaves.

10. HYPERICUM *floribus pentagynis calycibus obtusis, staminibus corollâ æquantibus, caule erecto herbaceo.* St. Johnswort with five styles to the flower, obtuse empalements, stamina equalling the petals, and an erect herbaceous stalk.

11. HYPERICUM *floribus monogynis, staminibus corollâ longioribus, calycibus coloratis, caule fruticoso.* St. Johnswort with one style to the flowers, stamina longer than the petals, coloured empalements, and a shrubby stalk.

The first and second sorts are both very common plants, growing in the fields in most parts of *England*; the first is used in medicine: these are rarely admitted into gardens, but I mention them in order to introduce the other, which are more deserving.

The first sort hath a perennial root, from which arise several round stalks a foot and a half high, dividing into many small branches, garnished at each joint with two small oblong leaves, standing opposite without foot-stalks; the branches also come out opposite. The leaves have many pellucid spots in them, which appear like so many holes, when held up against the light. The flowers are numerous on the top of the branches, standing on slender foot-stalks; they are composed of five oval petals, of a yellow colour, with a great number of stamina, not quite so long

long as the petals, terminated by roundish summits. In the center is situated a roundish germen, supporting three styles, crowned by single stigmas. The germen afterward becomes an oblong angular capsule, with three cells, filled with small brown seeds. The leaves and flowers of this are used in medicine; it is esteemed an excellent vulnerary plant, and of great service in wounds, bruises, and contusions; there is a compound oil made from this plant, which is of great use in the foregoing accidents.

The second sort hath square stalks, which rise about the same height with the first, but do not branch so much. The leaves are shorter and broader, and have no pellucid spots. The flowers sit upon short foot-stalks at the end of the branches, which are shaped like those of the other.

The third sort grows naturally in *Sicily*, *Spain*, and *Portugal*. This rises with shrubby stalks about three feet high, sending out small branches at each joint opposite, garnished with oblong oval leaves, placed by pairs, sitting close to the stalks, which have a rank scent like a he-goat. The flowers are produced in clusters at the end of the branches, they are composed of five oval yellow petals, with a great number of stamina, which are longer than the petals, and three styles which are longer than the stamina. The germen which supports these, afterward becomes an oval capsule with three cells, filled with small seeds.

The fourth sort grows naturally in the *Canary Islands*, so was formerly preserved in green-houses during the winter season, but is found to be hardy enough to resist the greatest cold of this country, and is now cultivated in the nurseries as a flowering shrub; this rises with a shrubby stalk six or seven feet high, dividing into branches upward, garnished with oblong leaves set by pairs close to the branches, which have a rank scent like the former. The flowers are produced at the end of the stalks in clusters, are very like those of the former sort, having a great number of stamina, which are longer than the petals.

These two sorts are propagated by suckers, which are plentifully sent forth from the old plant. They should be planted in a light dry soil, in which they will endure the severest cold of our climate very well.

The fifth sort grows naturally on mount *Olympus*, where it was discovered by Sir *George Wheeler*, who sent the seeds to the *Oxford* garden. This rises with many upright ligneous stalks about a foot high, garnished with small spear-shaped leaves sitting close to the stalks opposite. The flowers are produced at the top of the stalks three or four together, composed of five oblong petals, of a bright yellow colour, with a great number of stamina, which are of unequal lengths, some being longer, and others shorter than the petals, terminated by small roundish summits. In the center is situated an oval germen, supporting three slender styles, which are longer than the stamina. The germen afterward becomes an oval capsule, with three cells filled with small seeds.

This plant is usually propagated by parting of the roots, because the seeds do not always ripen in this country; the best time for doing of this is in *September*, that the plants may have time to get root before winter: it will live in the open air, if it is planted in a warm situation and a dry soil, but a plant or two should be kept in pots, to be sheltered under a frame in winter, lest in very severe frost, those in the open air should be destroyed. If this is propagated by seeds, they should be sown soon after they are ripe, in pots filled with light earth, and placed under a frame in the winter, to shelter them from frost, and in the spring the plants will appear; when these are fit to remove, some of them may be planted in a warm border, and others into pots, and treated in the same way as the old plants.

The sixth sort rises with a shrubby stalk seven or eight

feet high, with a reddish bark, and divides into small branches, garnished with oval heart-shaped leaves, sitting close to the stalks opposite. The flowers are produced at the end of the stalks in clusters; they are smaller than those of the third sort, and have obtuse empalements. The stamina are longer than the petals, and of a deeper colour. The flowers are succeeded by conical capsules of a purplish red colour, having three cells, filled with small seeds. This is now propagated in the nurseries as a flowering shrub, and may be treated in the same way as the third and fourth sorts.

The seventh sort was first brought from *Constantinople*, but has long been very common in the *English* gardens, for the roots spread and increase very fast, where it is permitted to stand long unremoved. The stalks of this are slender, and incline downward; they are garnished with oval, spear-shaped, smooth leaves, placed by pairs. The flowers are produced at the end of the stalks; they are very large, and of a bright yellow colour, with a great number of stamina, which stand beyond the petals; there are five styles in each flower, which are of the same length with the stamina.

This plant is easily propagated by parting of the root in *October*, that the plants may be well established before the drought of spring. As this will grow under trees, so it is a very proper plant to place under shrubs and trees to cover the ground, where they will make a good appearance during their season of flowering.

The eighth sort grows naturally in the island of *Minorca*, from whence the seeds were sent to *England* by Mr. *Salvador*, an apothecary at *Barcelona*, in the year 1718. This rises with a slender shrubby stalk about two feet high, sending out several weak branches with a reddish coloured bark, marked where the leaves have fallen off with a cicatrice. The leaves are small, oval, and waved on their edges, having several small protuberances on their surface, and sit close to the stalks, half embracing them with their base. The flowers are produced at the top of the stalks; they are large, of a bright yellow colour, with a great number of stamina, which are a little shorter than the petals; the flowers have five styles, and are succeeded by pyramidal capsules with five cells, which have a strong smell of turpentine, and filled with small brown seeds. This plant has a succession of flowers great part of the year, which renders it valuable; it is too tender to live through the winter in the open air in *England*, but requires no artificial heat; if the plants are placed in a dry airy glass-case in winter, where they may be protected from frost, and enjoy a good share of fresh air in mild weather, they will thrive better than in a warmer situation, but in a damp air their shoots soon grow mouldy and decay; nor should the plants have much water during the winter, but in summer they should be exposed in the open air, and in warm weather they should be frequently watered. This is propagated by cuttings, which should be planted in *June*, in pots filled with light earth, and plunged into a gentle hot-bed, and covered with a hand-glass. These will put out roots in six or seven weeks, when they should be carefully taken up, and each planted into a separate small pot, placing them in the shade till they have taken new root, then they may be removed to a sheltered situation, where they may remain till the frost comes, when they should be removed into shelter.

If these are propagated by seeds, they should be sown in autumn, in the same way as is before directed for the fifth sort, and the plants treated in the same manner as those raised from cuttings.

The ninth sort is the common *Tutsan*, or *Park Leaves*, which is sometimes used in medicine. It grows naturally in woods in several parts of *England*, so is not often admitted into gardens. This hath a shrubby stalk, which rises two feet high; the stalks are garnished with oval heart-shaped

shaped leaves, sitting close to them with their base, which are placed opposite. The flowers are produced in small clusters at the end of the stalk, they are yellow, but smaller than either of the sorts before-mentioned, and have many long stamina, which stand out beyond the flower with three styles. The germen afterward turns to a roundish fruit, covered with a moist pulp, which, when ripe, is black. The capsule has three cells, containing small seeds. It hath a perennial root, and may be propagated by parting it in autumn; it loves shade, and a strong soil.

The tenth sort grows naturally in *North America*; this rises with an upright herbaceous stalk three feet high, garnished with oblong leaves, placed opposite, which half embrace the stalk with their base. At the end of each stalk is produced one pretty large yellow flower, with an obtuse empalement, having many stamina, which are equal in length with the petals, and five styles which are so closely joined as to appear but one. The stigmas are reflexed, which denote their number; it is propagated by parting of the roots; the best time for this is in autumn; it should have a light soil, and an open situation.

The eleventh sort grows naturally in *China*, from whence the seeds were brought to the Right Hon. the Earl of *Northumberland*, and the plants were raised in his lordship's curious garden at *Stanwick*, and by his lordship's generosity, the *Chelsea* garden was furnished with this plant.

The root of this is composed of many ligneous fibres, which strike deep in the ground, from which arise several shrubby stalks, near two feet high, covered with a purplish bark, garnished with stiff smooth leaves, about two inches long, and a quarter of an inch broad, placed opposite, sitting close to the stalk, of a lucid green on their upper side, and gray on their under, having many tranverse veins running from the midrib to the border. The flowers are produced at the top of the stalks, growing in small clusters, each standing upon a short distinct foot-stalk; they have an empalement of one leaf, divided into five obtuse segments, almost to the bottom, which is of a deep purple colour. The flower is composed of five large obtuse petals of a bright yellow colour, which are concave, and in the center is situated an oval germen supporting a single style, crowned by five slender stigmas, which bend on one side; the style is attended by a great number of stamina, which are longer than the petals, and terminated by roundish summits.

This plant continues in flower great part of the year, which renders it the more valuable, and if it is planted in a very warm situation, it will live in the open air; but those plants which stand abroad will not flower in winter, as those do which are removed into shelter in autumn.

It may be propagated by slips from the root, or by laying down of the branches; if by slips, they should be planted in the spring on a moderate hot-bed, which will forward their putting out new roots; the layers should also be laid down at the same time, which will have taken root by autumn, when they may be transplanted into pots, and sheltered under a frame in winter, and in the spring, part of these may be planted in a warm border, and the others planted in pots to be screened in winter, lest those in the open air should be killed.

HYPERICUM FRUTEX. See Spiræa.

HYSSOPUS. Tourn. R. H. 200. tab. 95. Hyssop.

The Characters are,

The empalement of the flower is cylindrical and permanent. The flower is of one petal, of the grinning kind, with a narrow cylindrical tube; the chaps are inclining; the upper lip is short, plain, roundish, erect, and indented at the top. It hath four stamina, which stand apart, two of them are longer than the petal, the other two are shorter, and four germen, which afterward becomes so many oval seeds sitting in the empalement.

The Species are,

1. HYSSOPUS spicis fecundis. Hort. Cliff. 304. Hyssop with fruitful spikes; or the common Hyssop.

2. HYSSOPUS spicis brevioribus, verticillis compactis. Hyssop with shorter spikes, and whorls more compact; Hyssop with a red flower.

3. HYSSOPUS caule acuto quadrangulo. Hort. Upsal. 163. Hyssop with an acute square stalk.

4. HYSSOPUS corollis transversefalibus, staminibus inferioribus corollâ brevioribus. Hort. Upsal. 162. Hyssop with transverse petals, and the lower stamina shorter than the petal.

The first sort, which is the only one cultivated for use, hath a perennial root; the stalks are first square, but afterward become round, garnished with small spear-shaped leaves, placed opposite, with seven or eight very narrow erect leaves (or bractæ) rising from the same joint. The upper part of the stalk is garnished with whorls of flowers in a spike. There are four stamina in each flower, which spread at a distance from each other, the two upper are the shortest, which are situated on each side the upper lip; the two longer stand close to the two side segments, they are terminated by twin summits. At the bottom of the tube are situated four naked germen, which afterward becomes four oblong black seeds, sitting in the empalement; it grows naturally in the *Levant*. There is a variety of this with white flowers, but doth not differ from the blue in any other particular.

The second sort doth not grow so tall as the first; the stalks branch more, and the spikes of flowers are much shorter than those of the first. The whorls are closer together, and have long narrow leaves situated under each; the flowers are of a fine red colour. This sort is not quite so hardy as the common, for in 1739, the plants were all destroyed by the cold; this is certainly a distinct species.

These sorts of Hyssop are propagated either by seeds or slips; if by the seeds, they must be sown in *March*, upon a bed of light sandy soil, and when the plants come up, they should be transplanted out to the places where they are to remain, placing them at least a foot asunder each way; but if they are designed to abide in those places for a long time, two feet distance will be small enough, for they grow pretty large, especially if they are not frequently cut, to keep them within compass; they thrive best upon a poor dry soil, in which situation they will endure the cold of our climate better than when they are planted on rich ground. If they are propagated by slips, they should be planted either in spring or autumn in a bed of light earth, where they will take root in about two months, after which, they may be transplanted where they are to continue, managing them as was before directed for the seedling plants.

The third sort grows naturally in *North America*; this hath a perennial root, and rises with an upright square stalk, four or five feet high, garnished with oblique heart-shaped leaves sawed on their edges, ending in acute points; they are placed by pairs on short foot-stalks. The flowers grow in close thick spikes, four or five inches long at the top of the stalks: there are two varieties of this, one with pale yellow, and the other has purple flowers; the seeds of both sorts never vary to each other.

The fourth sort grows naturally in *Siberia*; this is a perennial plant with a strong fibrous root, sending out many square stalks, garnished with oblong leaves placed opposite. The flowers are produced at each joint toward the upper part of the stalks in small clusters, arising from the base of the leaves. The tube of the petal is longer than the empalement; the lips of the flower are oblique to it, being situated horizontally. The two upper stamina, and the style, stand out beyond the petal, but the other are shorter. The flowers are blue.

Both these sorts are very hardy, and may be easily propagated by seeds, which should be sown in autumn, for those sown in the spring do often lie a year in the ground before they vegetate; when the plants come up, they must be kept

clean from weeds, and thinned where they are too close. The following autumn they should be transplanted where they are to remain, for the roots will abide some years.

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JACEA. See Centaurea.

JACOBÆA. See Senecio and Othonna.

JALAPA. See Mirabilis.

JASIONE. *Lin. Gen. Plant.* 896. Rampions with scabious heads. This plant grows naturally on sterile ground, in most parts of England, and is rarely admitted into gardens.

JASMINOIDES. See Cestrum and Lycium.

JASMINUM. *Tourn. Inst. R. H.* 597. *tab.* 368. *Lin. Gen. Plant.* 17. The Jasmine, or Jessamine tree.

The Characters are,

The flower hath a tubulous empalement, which is permanent, cut into five segments at the brim; the flower is of one petal, cut into five segments at the top, which spread open. It hath two short stamina, situated within the tube of the petal. In the center is situated a roundish germen, which afterward turns to an oval berry, with a soft skin inclosing two seeds, which are flat on those sides which join, and convex on the other.

The Species are,

1. **J**ASMINUM *foliis oppositis pinnatis, foliolis acuminatis.* Jasmine with winged leaves placed opposite, whose lobes end in acute points; or the common white Jasmine.

2. **J**ASMINUM *foliis alternis ternatis pinnatisque, ramis angulatis.* *Hort. Upsal.* 5. Jasmine with trifoliate and winged leaves placed alternate, and angular branches; or the Italian yellow Jasmine.

3. **J**ASMINUM *foliis alternis ternatis simplicibusque, ramis angulatis.* *Hort. Cliff.* 5. Jasmine with trifoliate and single leaves placed alternate, and angular branches; or the common yellow Jasmine.

4. **J**ASMINUM *foliis oppositis pinnatis, foliolis brevioribus obtusis.* Jasmine with winged leaves placed opposite, whose lobes are shorter and obtuse; or Catalanian Jasmine.

5. **J**ASMINUM *foliis alternis ternatis, foliolis ovatis, ramis teretibus.* Jasmine with trifoliate leaves placed alternate, whose lobes are oval, and taper branches; or the yellow Indian Jasmine.

6. **J**ASMINUM *foliis oppositis ternatis, foliolis cordato acuminatis.* Jasmine with trifoliate leaves placed opposite, whose lobes are heart-shaped and pointed; the Azorian Jasmine, commonly called, the Ivy-leaved Jasmine.

7. **J**ASMINUM *foliis lanceolatis oppositis integerrimis, calycibus acutioribus pedunculis unifloris.* Jasmine with spear-shaped leaves placed opposite, and entire acute empalements, and one flower upon each foot-stalk.

The first sort is the common white Jasmine, which is a plant so generally known, as to need no description. This grows naturally at Malabar, and in several parts of India, yet has been long inured to our climate, so as to thrive and flower extremely well; but never produces any fruit in England. It is easily propagated by laying down the branches,

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which will take root in one year, and may then be cut from the old plant, and planted where they are designed to remain: it may also be propagated by cuttings, which should be planted early in the autumn, and if the winter should prove severe, the surface of the ground between them should be covered with tan, sea-coal ashes, or saw-dust, which will prevent the frost from penetrating deep into the ground, and thereby preserve them.

When these plants are removed, they should be planted where they are designed to be continued, which should be either against some wall, pale, or other fence, where the flexible branches may be supported. These plants should be permitted to grow rude in the summer, otherwise there will be no flowers, but after they are past, the luxuriant shoots should be pruned off, and the others must be nailed to the support.

There are two varieties of this with variegated leaves, one with white, and the other yellow stripes, but the latter is the most common: these are propagated by budding them on the plain Jasmine, and it often happens, that when the buds do not take, yet they will communicate their gilded miasma to the plants; so that in a short time after, many of the branches both above and below the places where the buds have been inserted, have been thoroughly tintured.

The two striped sorts should be planted in a warm situation, especially the white striped, for they are much more tender than the plain, and are very subject to be destroyed by great frosts, if they are exposed thereto; therefore the white striped should be planted to a south or south-west aspect, and in very severe winters their branches should be covered with mats or straw, to prevent their being killed: the yellow striped is not so tender, so may be planted against walls to east or west aspects; but these plants with variegated leaves, are not so much in esteem as formerly.

The second sort is frequently called Italian Jasmine by the gardeners, the plants being annually brought from thence by those who come over with Orange trees; these are generally grafted upon the common yellow Jasmine stocks, so that if the graft decays, the plants are of no value. This sort is somewhat tenderer than the common, yet will endure the cold of our ordinary winters, if it is planted in a warm situation. The flowers of this kind are generally larger than those of the common yellow sort, but have very little scent, and are not produced so early in the season. It may be propagated by laying down the tender branches, as was directed for the common white sort; or by budding or inarching it upon the common yellow Jasmine; the latter of which is preferable, by making the plants hardier than those which are obtained from layers.

The third sort was formerly more cultivated in the gardens than at present, for as the flowers have no scent, so few persons regard them. This hath weak angular branches, which require support, and will rise to the height of eight or ten feet, if planted against a wall or pale; but the plants do often produce a great number of suckers from their roots, whereby they become troublesome in the borders of the pleasure-garden; it is easily propagated by suckers or layers.

The fourth sort grows naturally in *India*, and also in the island of *Tobago*, where the woods are full of it; this hath much stronger branches than the common white sort, the leaves are winged, and are composed of three pair of short obtuse lobes, terminated by an odd one, ending in obtuse points; these lobes are placed closer than those of the common *Jasmine*, and are of a lighter green; the flowers come out from the wings of the stalks, standing on long foot-stalks, each sustaining three or four flowers, which are of a blush red on their outside, but white within; the tube of the flower is longer, the segments are obtuse, twisted at the mouth of the tube, and are of a much thicker texture than those of the common sort, so that there is no doubt of its being a distinct species; and the reason for Dr. *Linnaeus's* supposing it to be so was a mistake; for as these plants are generally grafted upon stocks of the common *Jasmine*, so there are always shoots coming out from the stocks below, which, if permitted to stand will produce flowers; and these do often starve and kill the grafts, so that there will be only the common sort left; and this has been the case with some plants which he examined, therefore supposed the difference of the other sort was wholly owing to culture; whereas if he had only observed the difference of their leaves, he would have certainly made two distinct species of them.

This plant is propagated by budding or inarching it upon the common white *Jasmine*, on which it takes very well, and is rendered hardier than those which are upon their own stocks. But those of this kind being brought over from *Italy* every spring in so great plenty, they are seldom raised here: I shall therefore proceed to the management of such plants as are usually brought into *England*, which are generally tied up in small bunches, containing four plants; their roots are wrapped about with Moss to preserve them from drying, which, if it happen that the ship has a long passage, will often occasion them to push out strong shoots from their roots, which must always be taken off before they are planted, otherwise they will exhaust the whole nourishment of the plant, and destroy the graft.

In the making choice of these plants, you should carefully observe if their grafts are alive, and in good health: for if they are brown and shrunk they will not push out, so that there will be only the stock left, which is of the common sort.

When you receive these plants, you must clear the roots of the Moss, and all decayed branches should be taken off; then place their roots into a pot or tub of water, which should be set in the green-house, or some other room, where it may be screened from the cold; in this situation they may continue two days, after which you must prune off all the dry roots, and cut down the branches within four inches of the place where they are grafted, and plant them into pots filled with fresh light earth; then plunge the pots into a moderate hot-bed of tanners bark, observing to water and shade them, as the heat of the season may require. In about three weeks or a month's time they will begin to shoot, when you must carefully rub off all such as are produced from the stock below the graft; they must now have a great share of air to strengthen them, and by degrees they must be hardened to endure the open air, into which they should be removed in *June*, placing them in a warm situation the first summer; for if they are too much

exposed to the winds, they will make but indifferent progress, being rendered tender by the hot-bed. If the summer proves warm, and the trees have succeeded well, they will produce some flowers in the autumn following, though they will be few in number, and not near so strong as they will be the succeeding years, when the trees are stronger and have better roots.

These plants are preserved in green-houses, with Oranges, Myrtles, &c. in the winter season, and require the same treatment: but notwithstanding most people preserve these plants in green-houses, yet they will endure the cold of our ordinary winters in the open air, if planted against a warm wall, and covered with mats in frosty weather, in which situation they will produce ten times as many flowers in one season as those kept in pots, and the flowers will likewise be much larger; but they should not be planted abroad till they have some strength, so that it will be necessary to keep them in pots two or three years; and when they are planted against the wall, which should be in *May*, that they may take good root in the ground before the succeeding winter, you must turn them out of the pots, preserving the earth to their roots, and nail up their shoots to the wall, shortening such of them as are a very long, that they may push out new shoots below to furnish the wall, continuing to nail up all the shoots as they are produced. In the middle, or toward the latter end of *July*, they will begin to flower, and continue to produce new flowers until the frost prevents them.

Toward the middle of *November*, if the nights are frosty, you must begin to cover your trees with mats, which should be nailed over them pretty close; but this should be done when the trees are perfectly dry, otherwise the wet being lodged upon the branches, will often cause a mouldiness upon them, and the air being excluded therefrom, will rot them in a short time: it will also be very necessary to take off these mats when the weather will permit, to prevent this mouldiness, and only keep them close covered in frosty weather; if a little mulch is laid upon the surface of the ground about their roots, and some bands of hay fastened about their stems, to guard them from the frost in very severe weather, it will preserve them: in the spring, as the weather is warmer, so by degrees the covering should be taken off, but they should not be exposed too soon to the open air, for the morning frosts and dry easterly winds, which often reign in *March*, do frequently pinch these plants if they are too early exposed. When the covering is taken off, the trees should be pruned, and cut out all decayed branches, shortening the strong shoots to about two feet long, which will cause them to shoot strong, and produce many flowers.

The fifth sort grows naturally in *India*; this rises with an upright woody stalk eight or ten feet high, covered with a brown bark, sending out several strong branches which want no support, garnished with trifoliate leaves of a lucid green, which are placed alternate on the branches; they are oval and entire, continuing green all the year: the flowers are produced at the end of the shoots in bunches of a bright yellow, and have a most grateful odour. They come out in *July*, *August*, *September*, and *October*, and sometimes continue to the end of *November*; they are frequently succeeded by oblong oval berries, which turn black when ripe, and have each two seeds.

This sort of *Jasmine* is propagated by laying down the tender branches; the shoots should be laid down in *March*, and if they are slit at the joint, as is practised in laying of Carnations, it will promote their rooting: when the weather is dry these layers must be frequently watered, which, if carefully attended to, the plants will be rooted by the succeeding spring, fit to be transplanted, when they must be

planted in pots filled with light earth, and managed as was before directed for the seedling plants.

This sort is frequently propagated, by inarching the young shoots into stocks of the common yellow Jasmine, but the plants so raised do not grow so strong as those which are upon their own stock; besides, the common yellow Jasmine is very apt to send out a great number of suckers from the root, which renders the plants unsightly; and if these suckers are not constantly taken off, as they are produced, they will rob the plants of their nourishment. The cuttings of this plant will also take root, if they are planted in pots in the spring, and plunged into a moderate hot-bed, covering them close with hand-glasses; when these are well rooted, they may be transplanted into separate pots and treated as the layers.

The sixth sort grows naturally in the *Azores*; this hath long slender branches which require support, which may be trained twenty feet high, garnished with trifoliate leaves, whose lobes are large and heart-shaped, of a lucid green, placed opposite on the branches. The flowers are produced at the end of the branches, in loose bunches, which are cut into five segments spreading open; they are of a clear white, and have a very agreeable scent. This the gardeners call the Ivy-leaved Jasmine.

This Jasmine is also pretty hardy, and requires no more shelter than only from hard frosts; and I am apt to think, if this sort was planted against a warm wall, and managed, as hath been directed for the *Catalonian* Jasmine, it would succeed very well; for I remember to have seen some plants of this kind growing against a wall in the gardens in *Hampton-court*, where they had endured the winter, and were in a more flourishing state than ever I saw any of the kind in pots, and produced a greater quantity of flowers. These plants are propagated in the same manner as the yellow *Indian* Jasmine, and both require the same treatment as the *Catalonian*.

The seventh sort was brought from the *Cape of Good Hope* by Capt. *Hutchinson* of the *Godolphin*, who discovered it growing naturally, a few miles up the land from the sea, being drawn to it by the great fragraney of its flowers, which he smelt at some distance from the plant, which was then in full flower; and after having viewed the plant, and remarked the place of its growth, he returned thither the following day with proper help, and a tub to put it in, and caused it to be carefully taken up, and planted in the tub with some of the earth on the spot, and conveyed it on board his ship, where it continued flowering great part of the voyage to *England*, where it arrived in good health; and for some years continued flowering, in the curious garden of *Richard Warner*, Esq; at *Woodford* in *Essex*, who was so obliging as to favour me with branches of this curious plant in flower, to embellish one of the numbers of my figures of plants, where it is represented in the 180th plate.

This plant seems not to have been known to any of the botanists, for I have not met with any figure or description of it in any of the books; there is one sort which is figured in the *Malabar* garden, and also in *Burman's* plants of *Ceylon*, which approaches near this; it is titled, *Nandi ervatum major*. *Hort. Mal.* But it differs from this in having longer and narrower leaves, the tube of the flower is larger, and the segments do not spread so open as this; but it is surprising that this plant should be unknown to the people at the *Cape of Good Hope*, for there was not one plant of it in their curious garden, nor could the captain see any other plant of it but that which he brought away.

The stem of this plant is large and woody, sending out many branches, which are first green, but afterward the bark becomes gray, and is smooth; the branches come out

by pairs, and have short joints; the leaves, which are of a thick consistence, are also set by pairs close to the branches; they are five inches long, and two inches and a half broad in the middle, lessening to both ends, terminating in a point, of a lucid green, having several tranverse veins from the midrib to the borders, which are entire. The flowers are produced at the end of the branches, sitting close to the leaves, one upon each foot-stalk; they have a tubulous empalement, with five corners or angles, cut deep at the brim, into five long narrow segments, ending in very acute points: the flower hath but one petal, for although it is cut into many deep segments at the top, yet these are all joined in one tube below; some of these flowers are much more double than others, having three or four orders of petals. In those flowers which I have examined, where they have been the most double, there has not been more than one stamen; but in some that were less double I have found two and in others three stamina, so that it is impossible to determine the class to which this plant belongs by them, nor indeed can any class of plants be distinguished by double flowers, whose parts of generation vary according as the flowers are more or less full of petals; nor can the genus be determined (as some have ignorantly pretended) by the imperfect germen below the flower, which, when first formed, viewed with glasses which magnify greatly, seemed as if composed of a capsule containing many seeds (which may be the case of many berries with one seed when examined in the like manner by persons who are fond of their own imaginations:). but as I have since received seeds of the single plants of this sort of Jasmine from *Ceylon*, which are berries divided into two seeds like the *Coffee* and *Azorian* Jasmine, which have grown in the *Chelsea* garden; so till these plants have produced flowers, it cannot be determined whether this should be placed in the genus of *Coffee*, or that of *Jasmine*; but to one of them it certainly belongs; and therefore the supposing it to be a new genus, is doing great injury to the science of botany. This plant is easily propagated by cuttings, which, if taken from the young branches, and planted in pots filled with a loamy soil, and plunged into a moderate hot-bed, covering them close down with hand-glasses, will soon put out roots: then they may be transplanted each into a separate small pot, filled with the like loamy earth, and plunged again into the hot-bed, to forward their putting out new roots. When these young plants have obtained strength, they may be treated hardily; for some plants I have kept under a common frame, where the pots have been plunged into an old bed of tanners bark which had no heat, others I have kept through the winter in a glass-case without any artificial heat, both which have succeeded, and the plants have flowered very well, and they have been more vigorous than those which were treated tenderly. This flower, when fully blown, is as large as a middling *Rose*, and some of them are as double as the *Damask Rose*, having a very agreeable odour; on the first approach it is something like that of the *Orange-flower*, but when more closely smelt to, has the odour of the common double white *Narcissus*. The season of this plant flowering in *England*, is in *July* and *August*, but in its native country it is supposed to flower great part of the year; for Capt. *Hutchinson*, who brought the plant over, said there was a succession of flowers on it, till the ship arrived in a cold climate, which put a stop to its growth.

JASMINUM ARABICUM. See *Coffee* and *Nyctanthes*.

JASMINUM ILICIS FOLIO. See *Lautana*.

JASMINE, the *Persian*. See *Syringa*.

JATROPHA. *Lin. Gen. Plant.* 961. *Cassada*, or *Cassava*.

The Characters are,

It hath male and female flowers in the same plant; the male flowers are salver-shaped of one petal, whose brim is cut into five roundish

roundish segments which spread open; they have ten awl-shaped stamina, five being alternately shorter than the other. The female flowers, which are situated in the same umbel, have five petals spread open like a Rose. In the center is a roundish germen with three deep furrows, which afterward becomes a roundish capsule with three cells, each containing one seed.

The Species are,

1. *JATROPHA foliis palmatis, lobis lanceolatis integerrimis lævibus.* Lin. Sp. Plant. 1007. Jatropha with hand-shaped leaves, whose lobes are spear-shaped, entire, and smooth; or Cassava of John Bauhin.

2. *JATROPHA foliis quinquelobatis, lobis acuminatis, acutè dentatis lævibus, caule fruticoso.* Jatropha with leaves composed of five smooth lobes ending in points, which are sharply indented on their edges, and a shrubby stalk.

3. *JATROPHA aculeata, foliis quinquelobatis acutè incis, caule herbaceo.* Prickly Jatropha with leaves having five lobes which are sharply cut on their edges, and an herbaceous stalk.

4. *JATROPHA aculeata, foliis trilobis, caule herbaceo.* Lin. Sp. Plant. 1007. Prickly Jatropha with leaves having three lobes, and an herbaceous stalk.

5. *JATROPHA foliis palmatis dentatis aculeatis.* Hort. Cliff. 445. Jatropha with hand-shaped, indented, prickly leaves.

6. *JATROPHA foliis multipartitis lævibus, stipulis setaceis multifidis.* Hort. Cliff. 445. Jatropha with leaves divided into many parts, and bristly stipulæ with many points; commonly called French Physick Nut in America.

7. *JATROPHA foliis cordatis angulatis.* Hort. Cliff. 445. Jatropha with angular heart-shaped leaves; commonly called Physick Nut in America.

8. *JATROPHA foliis quinquepartitis, lobis ovatis integris, setis glandulosis ramosis.* Flor. Leyd. Prod. 202. Jatropha with leaves divided into five parts, the lobes whereof are oval and entire, and branching bristles arising from the glands; commonly called Belly-ach Weed in America.

The first sort here mentioned, is the common Cassava or Cassava, which is cultivated for food in the warm parts of America, where, after the juice is expressed out of the root (which has a poisonous quality) it is ground into a kind of flour, and made up in cakes or puddings, and is esteemed a wholesome food.

This rises with a shrubby stalk six or seven feet high, garnished with smooth leaves, composed of seven lobes, which are joined at their base in one center, where they are narrow, but increase in their breadth till within an inch and a half of the top, where they diminish to an acute point. The flowers are produced in umbels at the top of the stalks, these are some male and others female, composed of five roundish petals which spread open; the male flowers have ten stamina joined together in a column, and the female flowers have a roundish germen with three furrows in the center, supporting three styles, crowned by single stigmas. The germen afterward turns to a roundish capsule with three lobes, each having a distinct cell, containing one seed.

The second sort was discovered by the late Dr. Housoun, at the Havana: this rises with an upright stalk ten or twelve feet high, which is first green and herbaceous, but afterward becomes ligneous, sending out a few branches at top, which are garnished with smooth leaves composed of five oval lobes, which end in acute points; the edges are indented in several irregular acute points. The flowers are produced in an umbel at the extremity of the stalks, of an herbaceous white colour, and are male and female in the same umbel, as the other sort; the capsule is smooth and has three cells, each including a single seed.

The third sort was discovered by the late Dr. Housoun, growing naturally about the town of La Vera Cruz: this hath a very thick fleshy root, in shape like the white Spanish Ra-

dish; the stalk rises from one to two feet high, it is taper, herbaceous, and branching, closely armed on every side with long white spines, which are pungent and stinging; the leaves are divided into five lobes, which are deeply jagged and waved on their edges; all the veins of the leaves are closely armed with stinging spines, so that it is dangerous handling them. At the end of the branches, the flowers are produced in umbels; they are white, and have empalements closely armed with the same spines as the stalks and leaves: there are male and female flowers in the same umbel, the female flowers are succeeded by tricapsular vessels, containing three seeds.

The fourth sort rises with an herbaceous stalk about a foot high, dividing into two or three branches, garnished with leaves standing alternate upon long foot-stalks, composed of three oblong lobes which are slightly sinuated on their edges, ending in acute points; the whole plant is closely armed with stinging spines. The flowers are small and grow in an umbel at the end of the branches, of a dirty white colour, male and female in the same umbel: the female flowers are succeeded by oval capsules with three lobes; which are covered with the same spines as the plant, and have three cells, each containing a single seed. This plant is annual.

The fifth sort grows naturally at Carthagena in New Spain; this hath a thick, swelling, fleshy root, from which arises an herbaceous stalk as big as a man's thumb; which is four or five feet high, divided into several branches, closely armed with long brown spines; the leaves are deeply cut into five lobes, which are jagged deeply on their sides, and the nerves are armed with stinging spines; the flowers are produced in umbels at the top of the branches, standing upon long naked foot-stalks, of a pure white colour, and are male and female in the same umbel: the male flowers appear first, which are composed of five petals, forming a short tube at bottom, and the stamina arise the length of the tube, joined in a column: the petals spread open flat above, and the stamina fill the mouth of the tube, shutting it up: the female flowers are smaller, but of the same shape, having no stamina, but an oval three-cornered germen, which afterward becomes a capsule with three lobes, each having a distinct cell, with one seed inclosed.

The sixth sort is now very common in most of the islands in the West-Indies, but was introduced from the continent, first into the French islands, and from thence it was brought into the British islands, where it is titled French Physick Nut, to distinguish it from the following sort, which is called Physick Nut from its purging quality.

This rises with a soft thick stem eight or ten feet high, dividing into several branches covered with a grayish bark. The leaves come out on strong foot-stalks, they are divided into nine or ten lobes in form of a hand, which are joined at their base, with many jagged points on their borders standing opposite. The upper side of the leaves are of a lucid green, but their under-side gray, and a little cottony. The flowers come out upon long foot-stalks from the end of the branches, formed into an umbel, in which there are male and female flowers, as in the other species; these umbels are large, and the flowers being of a bright scarlet, make a fine appearance; the leaves being also very remarkable for their beauty, has occasioned the plant being cultivated for ornament in most of the islands of the West-Indies.

The seventh sort grows naturally in all the islands of the West-Indies; this rises with a strong stalk twelve or fourteen feet high, divided into several branches; garnished with angular heart-shaped leaves, which end in acute points. The flowers come out in umbels at the end of the branches; they are male and female, of an herbaceous colour, so make but little appearance; the female flowers are succeeded by ob-

long oval capsules with three cells, each containing one oblong black seed.

The seeds of the two last sorts have been used as a purgative by the inhabitants of the *West-Indies*, but they operate so violently, that now they are seldom used; three or four of these nuts have worked upward and downward near forty times, on a person who was ignorant of their effects; but it is affirmed that this purgative quality is contained in a thin film, situated in the center of the nut, which, if taken out, the nuts are harmless, and may be eaten with safety.

The eighth sort grows naturally in all the islands of the *West-Indies*, where it is sometimes called wild Cassava, or Cassava, and at others Belly-ach Weed, the leaves of this plant being accounted a good remedy for the dry belly-ach. This plant rises with a soft herbaceous stalk to the height of three or four feet, covered with a purple bark, the joints having branching bristly hairs, rising in small bunches, not only upon the principal stalk, but also on the branches, and the foot-stalks of the leaves. The stalk divides upward into two or three branches, garnished with leaves standing on very long foot-stalks, which are divided into five oval entire lobes, ending in acute points. The flowers are produced at the end of the branches, upon slender naked foot-stalks, in small umbels; they are of a dark purple colour, having male and female flowers in the same umbel; the female flowers are succeeded by oblong, smooth, tricapsular vessels, in each of the cells is lodged one seed.

All these plants are natives of the warm parts of *America*, so are too tender to thrive in the open air in *England*. The first sort is cultivated in the *West-Indies* for food, where it is propagated by cutting the stalks into lengths of seven or eight inches, which, when planted, put out roots; the method of doing this having been mentioned in various books, I shall not repeat it here.

The other sorts are easily propagated by seeds, which should be sown on a good hot-bed in the spring, and when the plants are fit to remove, they should be each transplanted into a small pot, and plunged into a fresh hot-bed of tanners bark, carefully shading them till they have taken fresh root, after which they must be treated in the same manner as other tender plants from hot countries, admitting fresh air to them daily, in proportion to the warmth of the season; but as many of the sorts have succulent stalks, some of which have a milky juice, they should have but little water given them, for they are soon destroyed by wet.

The fourth sort is an annual plant, so if the seeds are sown early in the spring, and the plants are brought forward, they will perfect their seeds the same year; but the other sorts are perennial, so do not flower till the second or third year, therefore the plants should be plunged into the tan-bed in the stove, where they should constantly remain, giving them a large share of air in warm weather, but in winter they must be tenderly treated, and then must have very little water. With this management the plants will continue several years, and produce their flowers, and frequently perfect their seeds in *England*.

IBERIS. *Dillen. Nov. Gen.* 6. Sciatica Crefs.

The Characters are,

The flower hath an empalement of four oval leaves, which fall away. It hath four unequal petals. It hath six awl-shaped erect stamina, the two on the sides being shorter than the rest. In the center of the tube is situated a round compressed germen, which afterward becomes a roundish compressed vessel, having two cells, each containing one oval seed.

The Species are,

1. *IBERIS frutescens, foliis cuneiformibus obtusis integerrimis.* *Lin. Hort. Cliff.* 330. Shrubby Sciatica Crefs with entire, wedge-shaped, blunt leaves; commonly called Tree Candy Tuft.

2. *IBERIS frutescens foliis linearibus acutis integerrimis.* *Lin. Hort. Cliff.* 330. Shrubby Sciatica Crefs, with narrow, pointed, whole leaves; commonly called perennial Candy Tuft.

3. *IBERIS foliis lanceolatis acuminatis, inferioribus serratis, superioribus integerrimis.* *Lin. Hort. Cliff.* 330. Sciatica Crefs with spear-shaped pointed leaves, the under ones being sawed, but the upper entire; commonly called Candy Tuft.

4. *IBERIS foliis linearibus supernè dilatatis serratis.* *Flor. Leyd.* 330. Sciatica Crefs with narrow leaves dilated at their top, and sawed.

5. *IBERIS foliis sinuatis, caule nudo simplici.* *Lin. Hort. Cliff.* 328. Sciatica Crefs with sinuated leaves, and a single naked stalk; or Rock Crefs.

6. *IBERIS foliis lanceolatis acutis subdentatis, floribus racemosis.* *Lin. Hort. Upsal.* 184. Sciatica Crefs with acute, spear-shaped, indented leaves, and flowers growing in bunches.

7. *IBERIS foliis subrotundis crenatis.* *Royen. Lin. Sp. Plant.* 649. Iberis with roundish crenated leaves.

8. *IBERIS frutescens, foliis linearibus acutis, corymbis hemisphæricis.* Shrubby Sciatica Crefs with narrow acute leaves, and hemispherical bunches of flowers.

The first sort here mentioned is a low shrubby plant, which seldom rises above a foot and a half high, having many slender diffused branches, which fall to the ground if they are not supported. These are well furnished with wedge-shaped leaves toward their extremity, which continue green all the year; in autumn the flowers are produced at the end of the shoots, which are white, and grow in an umbel. These continue long in beauty, and are succeeded by others, so that the plants are rarely destitute of flowers for near eight months, from the end of *October* to the beginning of *June*.

This plant is somewhat tender, therefore is generally preserved in green-houses in winter. But although it is commonly so treated, yet in moderate winters this plant will live in the open air, if it is planted in a warm situation, and on a dry soil; and if, in very hard frost, they are covered either with mats, reeds straw, or Pease haulm, they may be preserved very well, and the plants which grow in the full ground, will thrive better, and produce a greater number of flowers, than those which are kept in pots; but the soil in which these are planted, should not be over rich, nor too wet, for in either of these they will grow too vigorous in summer, so will be in greater danger of suffering by the frost in winter; but when they grow on a gravelly soil, or among lime rubbish, their shoots will be short, strong, and not so replete with moisture, so will better resist the cold.

This plant is propagated by cuttings, which, if planted during any of the summer months, and shaded from the sun, will be rooted in two months, and may afterward be either planted in pots, or into the borders where they are designed to stand.

There is a variety of this with variegated leaves, which is preserved in some of the gardens where persons delight in these striped leaved plants. This is not so hardy as the plain sort, therefore must be treated more tenderly in winter.

The second sort is a plant of humbler growth than the first; this seldom rises more than six inches high, nor do the branches grow woody, but are rather herbaceous; the leaves of this plant continue green through the year, and the flowers are of as long duration as those of the first sort, which renders it valuable. This rarely produces seeds in *England*, but is propagated by slips, which, in summer, easily take root, and the plants may be treated in the same manner as hath been directed for the first sort, but is hardier.

The third sort is a low annual plant, the seeds of which were formerly sown to make edgings for borders in the pleasure-garden, for which purpose all the low annual flowers are very improper, because they do not answer the intent: which is, to prevent the earth of the borders falling into the walks, which these plants never can do; and although they make a pretty appearance during their continuance in flower, which is seldom more than a fortnight or three weeks, yet after their flowers are past, they become very unsightly; therefore all these sorts of flowers should be sown in small patches in the borders of the flower-garden, where, if they are properly mixed with other flowers, they will have a very good effect, and by sowing of them at three or four different seasons, there may be a succession of them continued in flower till autumn.

There are two different varieties of this third sort, one with red, and the other hath white flowers, but the white is not common in the gardens, but the seeds of the sixth sort is generally sold for it, and is seldom distinguished but by those who are skilled in botany; the seeds should be sown thin in patches, and when the plants are grown pretty strong, they should be thinned, leaving but six or eight in each patch to flower; and by thus treating them, they will put out side branches, and flower much stronger, and continue longer in beauty than when they are left closer together; they will require no other culture but to keep them clean from weeds.

The fourth sort seldom grows so large as the third, and the flowers are much smaller, but have an agreeable odour. It grows naturally in *Helvetia*, and is preserved in botanick gardens for variety. It is annual, and requires the same treatment as the third.

The fifth sort grows on sandy and rocky places in several parts of *England*, so is rarely admitted into gardens. The leaves of this are small, and cut to the midrib into many jags; these spread on the ground, and between them arise a naked foot-stalk, two or three inches long, sustaining small umbels of white flowers. This is an annual plant, whose seeds should be sown in autumn, where the plants are designed to remain, and require no other care but to keep them clean from weeds.

The sixth sort is very like the third, but differs in the shape of the leaves. The flowers of this are white, so may be sown to make a variety with the red. It requires the same treatment.

The seventh sort grows naturally on the *Alps*; this is a perennial plant. The lower leaves which rise from the root, are round, fleshy, and crenated on their edges. The stalk rises four or five inches high, garnished with small oblong leaves, which half embrace the stalks with their base. The flowers terminate the stalk in a round compact umbel; they are of a purple colour.

It is propagated by seeds, which should be sown on a shady border in autumn, and when the plants are strong enough to remove, they should be transplanted on a shady border where they are designed to remain, and will require no other care but to keep them clean from weeds.

The eighth sort grows naturally in *Spain* and *Portugal*; this hath a great resemblance of the second, but the stalks do not spread so much; they grow erect, about seven or eight inches high, are ligneous and perennial. The leaves are very narrow, and seldom more than an inch long, standing thinly upon the stalks, having no foot-stalks. The flowers grow in hemispherical umbels on the top of the stalks, and are of a purple colour.

This sort may be propagated by cuttings, which should be treated in the same way as is before directed for the first sort, and some of the plants may be planted on a warm border in a dry soil, where they will endure the cold of our

ordinary winters very well; but it will be proper to have two or three plants in pots, which may be sheltered under a frame in winter, to preserve the kind, if, by severe frost, those in the open air should be destroyed.

IBISCUS. See Hibiscus.

ICACO. See Chrysobalanus.

ILEX. *Lin. Gen. Plant.* 158. The Holly tree.

The Characters are,

They have male, female, and hermaphrodite flowers on different plants, and often on the same tree. The male flowers have a small permanent empalement of one leaf, indented in four parts; they have but one petal, cut into four segments; they have four awl-shaped stamina. The female flowers have their empalements and petals the same as the male, but have no stamina; in their center is placed the roundish germen, which afterward becomes a roundish berry with four cells, each containing a single hard seed.

The Species are,

1. ILEX *foliis oblongo-ovatis, undulatis, spinis acutis.* Holly tree with oblong oval leaves which are waved, and have acute spines; the common Holly.

2. ILEX *foliis ovatis, undulatis, marginibus aculeatis, paginis supernè spinosis.* Holly with oval waved leaves, whose borders are armed with strong thorns, and their upper surface prickly; commonly called Hedge hog Holly.

3. ILEX *foliis ovato-lanceolatis serratis.* *Hort. Cliff.* 40. Holly with oval, spear-shaped, sawed leaves; commonly called Daboon Holly.

There are several varieties of the common Holly with variegated leaves, which are propagated by the nursery-gardeners for sale, and some years past were in very great esteem, but at present are but little regarded; the old taste of filling gardens with thorn ever-greens being pretty well abolished; however, in the disposition of clumps, or other plantations of ever-green trees and shrubs, a few of the most lively colours may be admitted, which will have a good effect in the winter season, if they are properly disposed. As the different variegations of the leaves of Hollies, are by the nursery-gardeners distinguished by different titles, so I shall here mention the most beautiful of them, by the names they are generally known:

Painted-Lady Holly, *British* Holly, *Bradley's* best Holly, *Phyllis*, or Cream Holly, Milkmaid Holly, *Pritchett's* best Holly, Gold-edged Hedge-hog Holly, *Cheyney's* Holly, Glory of the West Holly, *Broaderick's* Holly, *Partridge's* Holly, *Herefordshire* white Holly, *Blind's* Cream Holly, *Longstaff's* Holly, *Eales's* Holly, Silver-edged Hedge-hog Holly.

All these varieties are propagated, by budding or grafting them upon stocks of the common green Holly: there is also a variety of the common Holly with smooth leaves, but this is frequently found intermixed with the prickly-leaved on the same tree, and often on the same branches: there are both sorts of leaves.

The common Holly grows naturally in woods and forests in many parts of *England*, where it rises from twenty to thirty feet high, and sometimes more, but their ordinary height is not above twenty-five feet: the stem by age becomes large, and is covered with a grayish smooth bark; and those trees which are not lopped or browsed by cattle, are commonly furnished with branches the greatest part of their length, so form a sort of cone; the branches are garnished with oblong oval leaves, of a lucid green on their upper surface, but are pale on their under, having a strong midrib: the edges are indented and waved, with sharp thorns terminating each of the points, so that some of the thorns are raised upward, and others are bent downward, and being very stiff renders them troublesome to handle.

The leaves are placed alternate on every side of the branches, and from the base of their foot-stalks come out the flowers in clusters, standing on very short foot-stalks; each of these sustain five, six, or more flowers. In some plants I have observed the flowers were wholly male, and produced no berries; in others I have observed female and hermaphrodite flowers, but upon some large old trees growing on *Windsor* forest, I have observed all three upon the same trees. The flowers are of a dirty white, and appear in *May*; these are succeeded by roundish berries, which turn to a beautiful red about *Michaelmas*, but continue on the trees, if they are not destroyed, till after *Christmas*, before they fall away.

The second sort grows naturally in *Canada*. The leaves of this sort are not so long as those of the common Holly, and their edges are armed with stronger thorns standing closer together; the upper surface of the leaves is set very close with short prickles, from whence the gardeners have given it the title of Hedge hog Holly. This sort is usually propagated in the nurseries, by budding or grafting it upon the common Holly, but I have raised it from the berries, and found the plants to be the same as those from whence the seeds were taken, so make no doubt of its being a distinct species.

There are two varieties of this with variegated leaves, one of which is yellow, and the other white. There is also a variety of the common Holly with yellow berries, which is also accidental, and is generally found on those plants which have variegated leaves, and but seldom on plain Hollies.

The common Holly is a very beautiful tree in winter, therefore deserves a place in all plantations of ever-green trees and shrubs, where its shining leaves and red berries make a fine variety; and if a few of the best variegated kinds are properly intermixed, they will enliven the scene. The Holly was also formerly planted for hedges, and is a very proper plant for that purpose.

The Holly is propagated by seeds, which never come up the first year, but lie in the ground as the Haws do; therefore the berries should be buried in the ground one year, and then taken up and sown at *Michaelmas* upon a bed exposed only to the morning sun; the following spring the plants will appear, which must be kept clean from weeds; and if the spring should prove dry, it will be of great service to the plants, if they are watered once a week; but they must not have it oftener, nor in too great quantity, for too much moisture is very injurious to these plants when young.

In this seed-bed the plants may remain two years, and then should be transplanted in the autumn, into beds at about six inches asunder, where they may stand two years longer; during which time they must be constantly kept clean from weeds, and if the plants have thriven well, they will be strong enough to transplant where they are designed to remain; for when they are transplanted at that age, there will be less danger of their failing, and they will grow to a larger size, than those which are removed when they are much larger; but if the ground is not ready to receive them at that time, they should be transplanted into a nursery in rows at two feet distance, and one foot asunder in the rows, in which place the plants may remain two years longer; and if they are designed to be grafted or budded with any of the variegated kinds, that should be performed after the plants have grown one year in this nursery; but the plants so budded or grafted, should continue two years after in the nursery, that they may make good shoots before they are removed; though the plain ones should not stand longer than two years in the nursery, because when

they are older they do not transplant so well. The best time for removing Hollies is in the autumn, especially in dry land, but where the soil is cold or moist, they may be transplanted with great safety in the spring; if the plants are not too old, or have not stood long unremoved, for if they have, it is great odds of their growing when removed.

The *Daboon* Holly grows naturally in *Carolina*, of which there are two sorts, one with spear-shaped, the other with linear leaves. This rises with an upright branching stem to the height of eighteen or twenty feet; the bark of the old stems is of a brown colour, but that of the branches or younger stalks is green and smooth, garnished with spear-shaped leaves, which are more than four inches long, and one and a quarter broad in the broadest part, of a light green and thick consistence; the upper part of the leaves are sawed on their edges, each serrature ending in a small sharp spine. The flowers come out in thick clusters from the side of the stalks, they are white, and shaped like those of the common Holly, but are smaller; these are succeeded by small, roundish, red berries in its native country, which make a fine appearance in winter, but they have not as yet perfected fruit in *England*, so far as I can learn.

Dr. *Linnæus* supposes this plant and the ever-green Cassine to be the same, but they are undoubtedly distinct plants; he may probably have been led into this mistake, by receiving seeds of both sorts mixed together from *America*, which I have more than once done; but whoever sees the two plants growing, cannot doubt of their being different.

This sort is tender while young, so requires protection in the winter till the plants are grown strong and woody, when they may be planted in the full ground in a warm situation, where they will endure the cold of our ordinary winters pretty well; but in severe frost they should be protected, otherwise the cold will destroy them.

This is propagated from seeds, in like manner as the common sort; the seeds of it will lie as long in the ground, so the berries should be buried in the ground a year, and then taken up and sown in pots filled with light earth, and placed under a frame in winter; in the spring the pots should be plunged into a hot-bed, which will bring up the plants; these should be preserved in pots while young, and sheltered in winter under a common frame till they have obtained strength, when they may be turned out of the pots and planted in the full ground, in a warm situation.

IMPATIENS. Rivin. Ord. 4. Lin. Gen. Plant. 899. Female Balsamine.

The Characters are,

The flower has a two-leaved small empalement. It hath five petals which are unequal, and shaped like a lip flower. It hath a nectarium in the bottom of the flower, shaped like a hood or cowl, which is oblique to the mouth rising on the outside, whose base ends in a tail or spur, and five short stamina, which are incurved. In the bottom is situated an oval sharp pointed germen, which after-ward becomes a capsule with one cell, opening with an elasticity in five valves which twist spirally, and contain several roundish seeds fixed to a column.

The Species are,

1. IMPATIENS *pedunculis multifloris solitariis, foliis ovatis, geniculis caulinis tumentibus*. Flor. Suec. 722. Impatiens with foot-stalks sustaining many single flowers, oval leaves, and stalks having swelling joints; Yellow Balsamine, or Touch me not.

2. IMPATIENS *pedunculis unifloris aggregatis, foliis lanceolatis, nectariis floris brevioribus*. Hort. Upsal. 276. Impatiens with

with foot-stalks sustaining single flowers, which arise in clusters, spear-shaped leaves, and nectariums which are shorter than the flower; the female Balsamine.

3. *IMPATIENS pedunculis trifloris solitariis, foliis angustolanceolatis*. Flor. Zeyl. 315. Impatiens with three flowers on a foot-stalk, and narrow spear-shaped leaves; upright or female Balsamine of *Ceylon*, with a narrow Peach leaf.

The first sort grows naturally in several parts of *Westmoreland* and *Yorkshire*, but is frequently introduced into gardens by way of curiosity. It is an annual plant, which rises about two or three feet high, with an upright succulent stalk, whose joints are swollen, garnished with oval smooth leaves, which stand alternate on every side the stalk. The flowers come out from the wings of the stalks, upon long slender foot-stalks, which branch into several other smaller, each sustaining one yellow flower, composed of five petals, which in front are shaped like the lip or grinning flowers, but at their base have a long tail like the flowers of *Indian Cress*; these are succeeded by taper pods, which, when ripe, burst open upon being touched, and twist spirally like a screw, casting out the seeds with great elasticity. If the seeds of this plant are permitted to scatter, they generally succeed better than when they are sown; for unless they are sown in the autumn soon after they are ripe, they very rarely grow. The plants require no care but to keep them clean from weeds, and thin them where they are too close. This delights in a shady situation and a moist soil. There is a variety of this with red flowers, which came from *North America*, which only differs in the colour of the flowers, and is equally hardy.

The second sort is the female Balsamine, of which there are several varieties; the common sort has been long an inhabitant in the *English* gardens; of this there is the white, the red, and striped flowered, and likewise the single and double flowering. The common single sort is so hardy as to rise in the full ground, and where the seeds scatter the plants will come up the following spring, but these do not come to flower so early as those which are raised upon a hot bed; however, they generally are stronger plants, and continue much longer in the autumn in flower than the others, so are an ornament to the garden, at such times when there is a greater scarcity of flowers.

There are two varieties, if not distinct species, with double variegated flowers; one of them grows naturally in the *East*, and the other in the *West-Indies*; that which comes from the *East-Indies*, by the title of *Immortal Eagle Flower*, is a most beautiful plant; the flowers are twice the size of those of the common sort, and are very double; they are in some scarlet and white variegated, and purple and white in others; and the plants producing plenty of the flowers, render them very valuable: if the seeds of these are carefully saved, the kinds may always be preserved. I have raised some plants from foreign seeds, whose flowers were so very double as to lose their male parts, so did not produce any seeds.

The seeds of these plants should be sown on a moderate hot-bed in the spring, and when the plants are come up about an inch high, they should be transplanted on another moderate hot-bed at about four inches distance, observing to shade them from the sun till they have taken new root; after which they should have a large share of free air, to prevent their drawing up tall and weak: they will require to be often refreshed with water, but it should not be given to them in too great plenty; for as their stems are very succulent, so they are apt to rot with much moisture. When the plants are grown so large as to touch each other, they should be carefully taken up with balls of earth to their roots, and each planted into a separate pot filled with light rich earth, and plunged into a very moderate hot-bed,

covered with a deep frame, to admit the plants to grow, shading them from the sun until they have taken fresh root; then they should have a large share of air admitted to them, and by degrees hardened, so as to bear the open air, into which part of the plants may be removed in *July*, placing them in a warm sheltered situation, where, if the season proves favourable, they will flower and make a fine appearance; but it will be proper to keep part of the plants either in a glass-case or a deep frame, in order to get good seeds, because those in the open air will not ripen their seeds unless the summer proves very warm; and the plants in shelter must have a good share of free air every day, otherwise they will grow pale and sickly; nor should they have too much of the sun in the middle of the day, in very hot weather, for that occasions their leaves hanging, and their requiring water, which is often very hurtful; therefore if the glasses are shaded in the middle of the day for three or four hours, the plants will thrive better, and continue longer in beauty than when they are exposed to the great heat. Those who are curious to preserve these plants in perfection, pull off all the single and plain coloured flowers from the plants which they preserve for seeds, leaving only those flowers which are double and of good colours; where this is carefully done, they may be continued without the least degeneracy.

The sort which grows in the *West-Indies*, is there called *Cockspur*. This hath single or semi-double flowers, which are as large as the last mentioned sort, but I never saw any of them more than half double, and only with white and red stripes: the plants are apt to grow to a very large size before they produce any flowers, so that it is late in the autumn before they begin to flower, and sometimes in bad seasons they will scarce have any flowers, and but rarely ripen their seeds here, so that few persons care to cultivate this sort, especially if they can have the other.

The third sort here mentioned grows naturally in *Ceylon*, and in many parts of *India*. This hath very narrow spear-shaped leaves, which are sawed on their edges; the foot-stalks sustain each three flowers, which are smaller than those of the common sort, so are not worthy of a place in gardens, except for the sake of variety. This is a tender plant, and requires the same treatment as the *Immortal Eagle Flower*.

IMPERATORIA. *Lin. Gen. Plant.* 321. *Masterwort*.

The *Characters* are,

It hath an umbellated flower; the principal umbel is plain, and has no involucre, but the small ones have. The principal umbel is uniform; the flowers have five heart-shaped inflexed petals. They have five hairy stamina. The germen is situated under the petals, which after-ward becomes a roundish compressed fruit divided in two parts, containing two oval bordered seeds.

We have but one *Species* of this genus, *viz.*

IMPERATORIA. *Hort. Cliff.* 103. *Masterwort*.

This plant grows naturally on the *Austrian* and *Styrian Alps*, and other mountainous places in *Italy*; the root is as thick as a man's thumb, running obliquely in the ground; it is fleshy, aromack, and has a strong acrid taste, biting the tongue and mouth like *Pellitory of Spain*; the leaves arise immediately from the root; they have long foot-stalks, dividing into three very short ones at the top, each sustaining a trilobate leaf, indented on the border; the foot-stalks are deeply channelled, and when broken emit a rank odour. The flower-stalks rise about two feet high, divided into two or three branches, each being terminated by a pretty large umbel of white flowers, whose petals are split; these are succeeded by oval compressed seeds, somewhat like those of *Dill*, but larger.

This plant is cultivated in gardens to supply the markets. It may be propagated either by seeds, or by parting the

roots; if it is propagated by seeds, they should be sown in autumn soon after they are ripe, on a bed or border, in a shady situation. In the spring the plants will appear, when they should be carefully weeded. Toward the beginning of May, if the plants come up too close together, they should be thinned, leaving them about six inches asunder, planting those which are drawn up into another bed about the same distance apart every way, being careful to water them duly, if the season should prove dry, until they have taken root; after which time these plants (as also those remaining in the seed-beds) will require no other culture but to keep them clear from weeds till the following autumn, when the plants should be transplanted where they are designed to remain, which should be in a rich moist soil, and a shady situation, for they delight in shade and moisture; so that where these are wanting, the plants will require a constant supply of water in dry weather. The distance which these plants should be placed, must not be less than two feet every way, for where they like their situation they will spread and increase much. When these plants are rooted, they will require no other culture, but to keep them clear from weeds; and in the spring before they shoot, the ground should be every year gently dug between the plants; in doing of which, great care should be had not to cut or bruise their roots. These plants, with this management, will continue several years, and will produce seeds in plenty.

If these plants are propagated by offsets, their roots should be parted at *Michaelmas*, and planted in a shady situation, at the same distance as has been directed for the seedling plants.

The roots of this plant are used in medicine, and are greatly recommended for their virtue in contagious distempers or the bites of venomous creatures; they are alexipharmick and sudrifick; by some they are recommended for cholicks and asthmas, for the cramp, and all cold diseases of the nerves.

INARCHING is a method of grafting, which is commonly called *grafting by approach*. This method of grafting is used, when the stock intended to graft on, and the tree from which the graft is to be taken, stand so near (or can be brought so near) that they may be joined together. The method of performing it is as follows: Take the branch you would inarch, and having fitted it to that part of the stock where you intend to join it, pare away the rind and wood on one side about three inches in length. After the same manner cut the stock or branch in the place where the graft is to be united, so that the rind of both may join equally together, that the sap may meet; then cut a little tongue upwards in the graft, and make a slit in the stock downward to admit it; so that when they are joined, the tongue will prevent their slipping, and the graft will more closely unite with the stock. Having thus placed them exactly together, they must be tied with some bafs, or other soft bandage; then cover the place with grafting clay, to prevent the air from entering to dry the wound, or the wet from getting in to rot the stock: you should also fix a stake into the ground to which that part of the stock, as also the graft, should be fastened, to prevent the wind from breaking them asunder, which is often the case when this precaution is not observed.

In this manner they are to remain about four months, in which time they will be sufficiently united, and the graft may then be cut from the mother tree, observing to slope it off close to the stock; and if at this time you cover the joined parts with fresh grafting clay, it will be of great service to the graft.

INDIGO. See Anil.

INGA. Plum. Nov. Gen. 13. tab. 19.

The Characters are,

The flower has a permanent empalement, divided into five parts.

at the top. It hath one funnel-shaped petal, cut into five fringed segments at the brim, out of which arise a great number of stamina, which are three times the length of the tube. At the bottom of the tube is situated an oblong germen, which afterward becomes a fleshy pod, including several irregular seeds.

The Species are,

1. *INGA foliis pinnatis, petiolo articulato marginato, leguminibus latis carnosis & undulatis.* Inga with winged leaves, whose foot-stalk is bordered and jointed, and broad, fleshy, waved pods.

2. *INGA foliis pinnatis, petiolo articulato marginato leguminibus tenuissimis lanuginosis.* Inga with winged leaves, whose foot-stalk is jointed and bordered, and very narrow woolly pods.

The first sort grows naturally on the north side of the island of *Jamaica*, and on the *Spanish main*. This rises with a woody stalk fifteen or sixteen feet high, covered with a white bark, sending out many crooked irregular branches, which hang to the ground, garnished with winged leaves, composed of three or four pair of oblong oval lobes, placed opposite on a midrib, which has a border or wing on each side between the lobes, of a lucid green on their upper side. The flowers come out in spikes toward the end of the branches, each standing in a distinct empalement, divided into five segments at the top, having a great number of very long purple stamina; the flowers are succeeded by long fleshy pods three quarters of an inch broad, filled with a sweet pulp, in which the seeds are lodged; this pulp is frequently eaten by the negroes.

The second sort grows plentifully at *La Vera Cruz*. This seldom rises more than eight or ten feet high, the branches are covered with a brown down, as are the under side of the leaves; the lobes are not so obtuse as those of the other sort. The flowers come out from the wings of the branches in small spikes; they are of a purplish colour within, but of an herbaceous colour without, with long purple stamina, and are succeeded by long, narrow, downy pods, containing several irregular seeds.

These plants are propagated by seeds, which should be sown early in the spring in pots, and plunged into a hot-bed of tanners bark. When the plants are come up two inches high, they should be carefully transplanted into separate pots, and plunged into the hot-bed again, being careful to shade them from the sun until they have taken new root; after which time they must be treated in the same way as other tender exotick plants during the summer. At *Michaelmas* they must be removed into the stove, and plunged into the tan in the warmest part of the bed. During the winter season they must be kept very warm, and have but little water in cold weather; in the summer they will require to be oftener watered, and in hot weather they should have a large share of fresh air; but they must not be removed out of the stove, for they are too tender to endure the open air of this country, in the warmest part of the year.

INOCULATING, or Budding. This is commonly practised upon all sorts of stone fruit in particular, such as Peaches, Nectarines, Cherries, Plums, &c. as also upon Oranges and Jasmines, and is preferable to any sort of grafting for most sorts of tender fruit. The method of performing it is as follows: You must be provided with a sharp penknife, having a flat haft (the use of which is to raise the bark of the stock to admit the bud) and some sound bafs mat, which should be soaked in water to increase its strength, and make it more pliable; then having taken off the cuttings from the trees you would propagate, you should choose a smooth part of the stock about five or six inches above the surface of the ground, if designed for dwarfs, but if for standards they should be budded six feet above ground; then with your knife make an horizontal cut cross the rind

of the stock, and from the middle of that cut make a slit downwards about two inches in length, so that it may be in the form of a T; but you must be careful not to cut too deep, lest you wound the stock: then having cut off the leaf from the bud, leaving the foot-stalk remaining, you should make a cross cut about half an inch below the eye, and with your knife slit off the bud, with part of the wood to it, in form of an escutcheon: this done, you must with your knife pull off that part of the wood which was taken with the bud, observing whether the eye of the bud be left to it, or not (for all those buds which lose their eyes in stripping, should be thrown away, being good for nothing :) then having gently raised the bark of the stock where the cross incision was made, with the flat haft of your penknife cleave the bark to the wood, and thrust the bud therein, observing to place it smooth between the rind and the wood of the stock, cutting off any part of the rind belonging to the bud, which may be too long for the slit made in the stock; and so having exactly fitted the bud to the stock, you must tie them closely round with bass mat, beginning at the under part of the slit, and so proceed to the top, taking care that you do not bind round the eye of the bud, which should be left open.

When your buds have been inoculated three weeks or a month, you will see which of them have taken; those of them which appear shrivelled and black being dead, but those which remain fresh and plump, you may depend are joined; at this time you should loosen the bandage, which, if not done in time, will pinch the stock, and greatly injure, if not destroy, the bud.

The *March* following you must cut off the stock about three inches above the bud, sloping it that the wet may pass off, and not enter the stock; to this part of the stock left above the bud, it is very proper to fasten the shoot which the bud makes in summer, to secure it from being blown out; but this part of the stock must continue on no longer than one year, after which it must be cut off close above the bud, that the stock may be covered thereby.

The time for inoculating is, from the middle of *June* until the middle of *August*, according to the forwardness of the season, and the particular sorts of trees to be increased; which may be easily known, by trying the buds whether they will come off well from the wood. But the most general rule is, when you observe the buds formed at the extremity of the same year's shoots, which is a sign of their having finished their spring growth.

INTYBUS. See Cichorium.

INULA. *Lin. Gen. Plant.* 860. Elecampane.

The Characters are,

It hath a radiated compound flower, with an imbricated empalement. The disk, or middle of the flower, is composed of hermaphrodite florets; the border, or ray of female half florets, stretched out like a tongue. The hermaphrodite florets are funnel-shaped, and cut into five parts at the top; these have five short slender stamina, which coalesce at the top; they have one long germen, crowned with down. The female half florets have narrow, entire, tongue-shaped petals, no stamina, but a long crowned germen with a hairy style. The germen in both flowers become a single, narrow, four-cornered seed, crowned with a down, sitting on a naked receptacle.

The Species are,

1. INULA foliis ovatis, rugosis, subtus tomentosus, calycum squamis ovatis. *Aman. Acad.* 1. p. 410. Elecampane with oval rough leaves, woolly on their under side, and the scales of the empalement oval; called Elecampane.

2. INULA foliis dentatis hirsutis, radicalibus ovatis, caulinis lanceolatis amplexicaulibus, caule paucifloro. *Lin. Sp. Plant.* 881. Inula with hairy indented leaves, those at the bottom oval, but the upper are spear-shaped, embracing the stalks, with few flowers.

3. INULA foliis lanceolatis recurvis serrato ciliatis, floribus solitariis, ramis angulatis. *Aman. Acad.* 1. p. 410. Inula with spear-shaped recurved leaves, which are sawed, hairy flowers growing singly, and angular branches.

4. INULA foliis lanceolatis recurvis, subdentatis, scabris, floribus subfasciculatis. *Lin. Sp. Plant.* 883. Inula with spear-shaped recurved leaves, which are rough and indented, and flowers growing in clusters.

5. INULA foliis linearibus carnosus tricuspidatis. *Lin. Sp. Plant.* 883. Inula with narrow fleshy leaves ending in three points; called Golden Samphire.

6. INULA foliis lanceolatis pubescentibus integerrimis, caule unifloro. *Lin. Sp. Plant.* 884. Inula with soft, hairy, spear-shaped, entire leaves, and one flower on a stalk.

7. INULA foliis oblongis, integris, hirsutis, caule piloso, corymbofo, floribus confertis. *Lin. Sp. Plant.* 881. Inula with oblong, entire, rough leaves, a hairy stalk divided by a corymbus, and flowers growing in clusters.

8. INULA foliis lanceolatis, serratis, subamplexicaulibus, subtus villosis, caule ramosa erecto. *Lin. Sp. Plant.* 882. Inula with spear-shaped sawed leaves embracing the stalk, hairy on their under side, and an erect branching stalk.

9. INULA foliis lanceolatis semiamplexicaulibus hispida, caulibus subunifloris teretibus. *Lin. Sp. Plant.* 883. Inula with spear-shaped prickly leaves half embracing the stalk, which is taper, and has but one flower.

10. INULA foliis ovatis, hirsutis, semiamplexicaulibus, caule ramoso piloso, squamis calycinis lanceolatis. Inula with oval hairy leaves half embracing the stalk, which is branching and hairy, and spear-shaped scales to the empalement.

11. INULA foliis ovato-lanceolatis denticulatis sessilibus, caule piloso erecto corymbofo. Inula with oval, spear-shaped, indented leaves, fitting close to the stalk, and an upright hairy stalk, terminating in a corymbus.

12. INULA foliis linearibus carnosus tricuspidatis, caule fruticoso. Inula with narrow, fleshy, three-pointed leaves, and a shrubby stalk.

13. INULA caule erecto hispido, foliis lanceolatis asperis, floribus alaribus solitariis sessilibus, terminalibus umbellatis. Inula with an erect prickly stalk, spear-shaped rough leaves, flowers proceeding singly from the sides of the stalks, fitting close, and terminating in an umbel.

The first sort grows naturally in several parts of England, but it is cultivated in gardens for the roots, which are used in medicine, and are accounted carminative, sudorifick, and alexipharmick, of great service in shortness of breath, coughs, stuffing of the lungs, and infectious distempers.

It hath a perennial root, which is thick, branching, and of a strong odour. The lower leaves are eight or nine inches long, and four broad in the middle, rough on their upper side, but downy on their under. The stalks rise about four feet high, and divide toward the top into several smaller branches, garnished with oblong oval leaves, indented on their edges, ending in acute points. The flowers terminate the stalks, each branch ending with one large, yellow, radiated flower, sitting in a scaly empalement, whose scales are oval, and placed like scales on fishes over each other. The flowers are succeeded by narrow four-cornered seeds crowned with down.

This sort may be propagated by seeds, which should be sown in autumn, soon after they are ripe, for if they are kept till the spring they seldom grow; but where they are permitted to scatter, the plants will come up the following spring without any care, and may be either transplanted the following autumn, or if they are designed to remain they should be hoed out to the distance of ten inches, or a foot each way, and constantly kept clean from weeds; these roots will be fit for use the second year.

But most people propagate this by offsets, which, if taken from the old roots, with a bud or eye to each, will take root very easily; the best time for this is the autumn, as soon as the leaves begin to decay; these should be planted in rows about a foot asunder, and nine or ten inches distance in the rows; the spring following the ground must be kept clean from weeds, and if in autumn it is slightly dug, it will promote the growth of the roots, which will be fit for use after two years growth; the young roots are preferable to those which are old and stringy. It loves a gentle loamy soil, not too dry.

The second sort hath a perennial root, from which arise several stalks about two feet high. The leaves at bottom are oval, indented, and hairy; those above embrace the stalks with their base. The stalks are divided into several branches, garnished with a few scattering yellow flowers. The root has a very sweet odour when broken.

The third sort hath a perennial root, from which arises many spear-shaped, smooth, recurved leaves. The stalks are angular and rise near two feet high, branching at the top into several foot-stalks, each sustaining one yellow radiated flower.

The fourth sort rises with an upright stalk, between three and four feet high, with spear-shaped leaves, which turn backward, indented on their edges, and rough on their upper side. The flowers are collected in close bunches on the upper part of the stalks; they are small and yellow. It grows on the *Alps*, and other mountainous parts of *Europe*.

The fifth sort grows naturally on the sea coasts in many parts of *England*. This rises with an upright stalk a foot and a half high, garnished with fleshy succulent leaves, which come out in clusters. The flowers are yellow, and come out at the top of the stalks in small umbels. The young branches of this plant are frequently sold in the *London* markets for *Samphire*, but this is a great abuse, because this plant has none of the warm aromack taste of the true *Samphire*.

The sixth sort grows naturally in *Germany*. This rises with upright stalks a foot and a half high, garnished with spear-shaped leaves, covered with soft hairs. The stalks do each support one large yellow flower.

The seventh sort has a perennial root. This grows naturally in *Hungary*. The leaves are oblong and hairy. The stalks branch at the top in form of a corymbus. The flowers are small, yellow, and in close clusters.

The eighth sort grows naturally in *Austria*, *Bohemia*, and other parts of *Germany*. This hath a perennial root; the stalk rises two feet high, garnished with spear-shaped woolly leaves, which closely embrace the stalks with their base. The upper part of the stalk divides into two or three erect branches, or foot-stalks, each sustaining one pretty large, deep yellow flower.

The ninth sort grows naturally in the south of *France*, *Spain*, and *Italy*. This hath a perennial root, from whence arise several stalks about one foot high; the lower leaves are spear-shaped and prickly, the upper embrace the stalks, which divide into several branches, each being terminated by one yellow flower.

The tenth sort hath a perennial root; the stalk rises about a foot high, dividing into many branches, garnished by oval hairy leaves, which half embrace the stalks with their base; each of the branches is terminated by one large yellow flower, whose empalement is composed of oval scales.

The eleventh sort grows naturally in *Hungary*. This rises with single upright stalks two feet high, garnished with oval spear-shaped leaves, slightly indented on the edges, which sit close to the stalks, and divide in form of a corymbus at the top. The flowers are pretty large, and of a pale yellow colour.

The twelfth sort grows naturally in the *Canary Islands*. This hath several shrubby stalks near four feet high, which divide into smaller branches, garnished with clusters of narrow fleshy leaves, divided into three parts at their points. The flowers come out on the top of the stalks; they are small, and of a pale yellow colour.

The second, third, fourth, sixth, seventh, eighth, ninth, tenth, and eleventh sorts, are abiding plants, which will thrive and flower in the open air in *England*; they may be all propagated by parting of their roots. The best time for doing of this is in autumn, when the plants should be removed; these may be intermixed with other flowering plants in the borders of large gardens, where they will make an agreeable variety during their continuance in flower. As these roots multiply pretty fast, they should be allowed room to spread, therefore should not be planted nearer than two feet from other plants; and if they are removed every third year, it will be often enough, provided the ground between them be dug every winter, and in summer, if they are kept clean from weeds, they will require no other care.

The twelfth sort will not live abroad in the open air in *England*, during the winter season, so must be removed into shelter in autumn, but should have as much free air as possible at all times, when the weather is mild, otherwise it is apt to draw up weak. This is easily propagated by cuttings any time in summer, which, if planted in a shady border, will take root in a short time.

The thirteenth sort was sent me from *Maryland*, where it grows naturally. This rises with a strong stalk about a foot and a half high, closely set with prickly hairs, and garnished with rough spear-shaped leaves; toward the upper part of the stalk there are single flowers coming from the wings at each joint, and the stalk is terminated by a cluster of small yellow flowers, disposed in form of an umbel.

JOHNSONIA. Dale.

The Characters are,

The flower hath an empalement of one leaf, cut at the brim into short segments. It hath one tubulous petal, divided into four parts at the brim, and four slender stamina, which are longer than the petal. In the center is situated a roundish germen, which afterward becomes a smooth globular berry, inclosing four hard oblong seeds.

We have but one Species of this genus, viz:

JOHNSONIA floribus verticillatis sessilibus, foliis ovato-lanceolatis oppositis, caule fruticoso. Dale. Shrubby Johnsonia with oval spear-shaped leaves sitting close to the stalks, placed opposite, and flowers growing in whorls.

This shrub grows plentifully in the woods near *Charleston* in *South Carolina*. It rises from four to six feet high, sending out many branches from the side, which are woolly when young, like those of the *Wayfaring tree*, garnished with oval spear-shaped leaves, placed opposite, standing on pretty long foot-stalks. The flowers come out in whorls round the stalks, sitting very close to the branches; they are small, tubulous, cut into four obtuse segments at the top, which expand, and are of a deep purple colour; these are succeeded by soft succulent berries, which turn first to a bright red colour, but afterward change to a deep purple when ripe, and inclose four hard oblong seeds.

The seeds of this plant were sent by Mr. *Catesby*, from *Carolina*, in 1724, and many of the plants were then raised in several curious gardens in *England*; most, if not all, of them were afterward planted in the open air, where they flourished very well for several years, and several of the plants produced flowers for some years, but were killed in the severe frost 1740; but the young plants which were raised from Dr. Dale's seeds the year before, which were only sheltered under a frame, were saved.

This plant rises easily from seeds, if they are sown in a moderate hot-bed; the best way is to sow the seeds in pots, and plunge them into a tan-bed, and when the plants come up, and have obtained some strength, they should be gradually inured to the open air, into which they should be removed in *June*, and placed in a sheltered situation, where they may remain till autumn. These young plants should be placed under a frame before the early frost comes on, for a small frost in autumn will kill the tender part of their shoots, which often causes their stalks to decay most part of their length before the spring. During the winter season they should be screened from frost, but in mild weather they must enjoy the free air. The following spring, just before the plants shoot, they should be carefully turned out of the pots, so as not to break their roots; and part of them may be planted in small pots, and the others into a nursery-bed in a warm situation, at about four or five inches asunder; those in the pots should be plunged into a moderate hot-bed, which will forward their taking fresh root, but afterward must be hardened to bear the open air as before; these plants in pots should be sheltered under a frame in winter three or four years, till they have obtained strength, then they may be turned out of the pots, and planted in a warm situation, where they will live in the open air in common winters, but in severe frost they are in danger of being killed, if they are not sheltered.

Those plants in the beds should also be covered with mats, or straw, in frosty weather, and after they have obtained strength, they may be transplanted into a warm situation, as the other.

JONQUIL. See Narcissus.

IPOMOEA. *Lin. Gen. Plant.* 199. Quamoclit, or Scarlet Convolvulus.

The Characters are,

The flower hath a small permanent empalment, cut into five parts at the top. The petal is funnel-shaped, having a long cylindrical tube, whose brim is five-pointed, spreading open flat. It hath five awl-shaped stamina. In the bottom of the tube is situated a round germen, which afterward becomes a roundish capsule with three cells, inclosing three oblong seeds.

The Species are,

1. IPOMOEA foliis pinnatifidis linearibus, floribus solitariis. *Hort. Cliff.* 60. Ipomoea with very narrow many-pointed leaves, and solitary flowers.

2. IPOMOEA foliis cordatis acuminatis, basi angulatis, pedunculis multifloris. *Hort. Upsal.* 39. Ipomoea with heart-shaped pointed leaves, angular at the base, and many flowers on a stalk; commonly called Scarlet Convolvulus.

3. IPOMOEA foliis cordatis acutis integerrimis, floribus solitariis. *Prod. Leyd.* 430. Ipomoea with acute, heart-shaped, entire leaves, and solitary flowers.

4. IPOMOEA foliis cordatis integerrimis, floribus confertis, corollis indivisis. *Sauv. Monsp.* 114. Ipomoea with heart-shaped entire leaves; flowers growing in clusters, and undivided petals.

5. IPOMOEA foliis palmatis, lobis septenis lanceolatis integerrimis. *Hort. Upsal.* 39. Ipomoea with hand-shaped leaves, composed of seven spear-shaped entire lobes; called Spanish Harbour Vine.

6. IPOMOEA foliis trilobis cordatis, pedunculis trifloris. *Lin. Sp. Plant.* 161. Ipomoea with heart-shaped leaves having three lobes; and three flowers on a foot-stalk.

7. IPOMOEA foliis palmatis, floribus aggregatis. *Flor. Zeyl.* 79. Ipomoea with hand-shaped leaves, and flowers growing in clusters; called Tyger's Foot.

8. IPOMOEA foliis digitatis glabris, foliolis sessilibus, caule lævi. *Lin. Sp. Plant.* 162. Ipomoea with smooth hand-shaped leaves, whose lobes sit close, and a smooth stalk.

The first sort grows naturally in both *Indies*; in the *West-*

Indies it is called Sweet *William*, and by some *Indian Pink*. It rises with a twining stalk seven or eight feet high, sending out many slender twining branches, which twist about any neighbouring plants for support; the leaves are winged, being composed of several pair of very fine narrow lobes, not thicker than fine sewing thread; they are about an inch long, of a deep green, and sometimes are by pairs opposite, and at others they are alternate; the flowers come out singly from the side of the stalks, standing upon slender foot-stalks about one inch long; they are funnel-shaped, having a tube an inch long, which is narrow at bottom, but gradually widens to the top, and spreads open flat, with five corners or angles; they are of a most beautiful scarlet colour, so make a fine appearance. This is an annual plant in *England*, but whether it is so in its native place I cannot tell; for as the seeds fall to the ground, so there may be a succession of young plants come up among the old ones, which, if not carefully observed, may occasion the plants to be thought perennial.

This is a tender plant, so will not thrive in the open air in *England*. It is propagated by seeds, which should be sown on a hot-bed in the spring, and as the plants will soon appear, they should be each transplanted into a small pot, before they twine about each other, for then it will be difficult to disengage them without breaking their tops. When they are potted they should be plunged into a new hot-bed, and sticks placed down by each plant for their stalks to twine about; after they have taken new root, they should have a good share of air in warm weather, to prevent their drawing up weak; and when they are advanced too high to remain under the frame, they should be removed into the tan-bed in the stove, where they should have support, for their branches will extend to a considerable distance. In this place they will begin to flower in *June*, and there will be a succession of flowers till the end of *September*, and seeds will ripen very well in autumn.

The second sort grows naturally in *Carolina*, and the *Bahama Islands*. This is also an annual plant in *England*, but not so tender as the former. It hath a twining stalk, which rises five or six feet high, garnished with heart-shaped leaves, ending in acute points, divided into angles at their base; the flowers come out from the side of the branches, upon slender foot-stalks, which support three or four flowers of the same form and size as the former, but not so deep coloured. There is a variety of this with Orange-coloured flowers, but they do not differ in any other respect. If the seeds of this sort are sown on a warm border of light earth in the spring, the plants will come up, and in favourable seasons will flower and produce good seeds; but most people raise the plants on a very gentle hot-bed, and transplant them afterwards into the borders, by which method they are brought forward, so will perfect their seeds earlier.

The third sort is like the second, but the leaves have no angles, and the flowers are of a Rose colour, each foot-stalk sustaining one flower. This may be treated in the same manner as the second sort.

The fourth sort grows naturally in the *West-Indies*, where it twines about any neighbouring support, and rises ten or twelve feet high, garnished with large, heart-shaped, entire leaves; the flowers are blue, and come out from the side of the branches, upon slender foot-stalks in clusters; their brims are not angular as in the former species, but entire. This sort is propagated by seeds, which should be sown on a hot-bed in the spring, and the plants afterward treated in the same way as is before directed for the first sort, for it is too tender to thrive in the open air here.

The fifth sort is cultivated in most of the islands in the *West-Indies*, but is supposed to have been introduced there from the *Spanish* main. The plants rise to a very great height,

height, and send out many branches, so are planted to cover arbours for shade in the islands, from whence it had the appellation of *Spanish Arbour Vine*. The stalks of this plant are covered with a purple bark, they twine about any neighbouring support, sending out many side branches, so that one plant will cover an arbour of fifty feet long. The leaves are divided into seven lobes almost to the bottom; the flowers come out from the side of the stalks, they are large, funnel-shaped, of a bright yellow colour, and smell very sweet; these are succeeded by large roundish capsules with three cells, containing one large seed in each, which is of a dark colour.

This is a perennial plant, but too tender to thrive in the open air in *England*; the seeds of this must be sown upon a hot-bed in the spring, and when the plants come up they must be transplanted into separate pots, and plunged into a fresh hot-bed; but as they will soon grow too tall to stand under a frame, they should be removed into the bark-stove, where they should constantly remain. As these plants extend their shoots to a very great length, they require a tall stove, where they may have room to grow, without which they will never produce any flowers. I have had these plants several years, but have only seen one flower produced from them; for they grow so very large before they begin to have flowers, as that few of the stoves in *England* have height enough for their growth.

The sixth sort grows naturally in most of the islands in the *West-Indies*; this hath a twining stalk, which rises ten or twelve feet high, garnished with leaves divided into three lobes, which are heart-shaped; the foot-stalks arise from the side of the stalks, each sustaining three purple flowers. This is also tender, so the plants must be raised on a hot-bed in the spring, and afterwards planted in separate pots, plunging them into another hot-bed, where they may remain till they reach the glasses; then they should be removed into a glass-case where they may have room, and be screened from the cold, but should have a large share of free air admitted to them in warm weather; with this treatment the plants will flower and produce ripe seeds.

The seventh sort grow naturally in *India*; this rises with a twining hairy stalk four or five feet high, garnished with hairy hand-shaped leaves, divided to the bottom into several lobes; the flowers come out in clusters, inclosed in a five-cornered involucre; they are of a purplish colour but small, and open only in the evening, so make no figure. This is propagated by seeds, and requires the same treatment as the sixth sort.

The eighth sort grows naturally in the *West-Indies*; this hath a smooth twining stalk, which rises four or five feet high, garnished with hand-shaped leaves having five lobes, which sit close to the stalks; the flowers come out from the side of the stalks upon short foot-stalks, which sustain two or three purple flowers, which are succeeded by round tri-capsular seed-vessels, in each cell there is one brown seed.

This sort requires the same treatment as the two former, with which it will produce flowers and perfect its seeds in *England*.

IRIS. *Tourn. Inst. R. H.* 358. tab. 186, 187, 188. Flower-de-luce.

The Characters are,

The flowers are inclosed in *spathæ* (or sheaths) which are permanent; the flowers are divided into six parts, the three outer are oblong, obtuse, and reflexed, the three inner are erect, and end in acute points; they have three awl-shaped stamens, which lie upon the reflexed petals. Under the flower is situated an oblong germen, which afterward becomes an oblong angular capsule with three cells, filled with large seeds.

The Species are,

1. IRIS corollis imberbibus, petalis interioribus stigmate mino-

ribus, foliis ensiformibus. *Hort. Cliff.* 19. Iris with an unbearded flower, the inner petals smaller than the stigma, and sword-shaped leaves; or yellow Marsh Flower-de-luce.

2. IRIS corollis barbatis, caule foliis longiore multifloro. *Hort. Cliff.* 18. Iris with bearded flowers, the stalks longer than the leaves, with many flowers; or common German Flower-de-luce.

3. IRIS corollis barbatis, scapo nudo longitudine foliorum multifloro. *Prod. Leyd.* 17. Iris with a bearded flower, and a naked stalk the length of the leaves, with many flowers.

4. IRIS corollis barbatis, caule subfolioso longitudine foliorum multifloro. *Prod. Leyd.* 17. Iris with a bearded flower, and a leafy stalk the length of the leaves, with many flowers.

5. IRIS corollis barbatis, caule foliis longiore unifloro. *Hort. Cliff.* 18. Iris with a bearded flower, and a stalk longer than the leaves, having one flower; commonly called *Caledonian Iris*.

6. IRIS corollis herbatis, caule foliis brevior multifloro. *Hort. Upsal.* 17. Iris with a bearded flower, and a stalk shorter than the leaves, with many flowers.

7. IRIS corollis barbatis, caule foliis brevior unifloro. *Lin. Sp. Plant.* 38. Iris with a bearded flower, and a stalk shorter than the leaves, with one flower.

8. IRIS corollis barbatis, caule foliis longiore multifloro. Iris with a bearded flower, a stalk longer than the leaves with many flowers; called greater *Dalmatian Iris*.

9. IRIS corollis barbatis, germinibus trigonis, foliis ensiformibus longissimis caule foliis longiore bifloro. *Pluk.* 154. Iris with a bearded flower, a three-cornered germen, very long sword-shaped leaves, and a stalk longer than the leaves, with two flowers.

10. IRIS corollis imberbibus, germinibus sexangularibus, caule ancipiti, foliis linearibus. *Hort. Cliff.* 19. Iris with flowers having no beards, a six-cornered germen, a stalk alike on both sides, and narrow leaves.

11. IRIS corollis imberbibus, caule foliis brevior trifloro, foliis lineari-ensiformibus. Iris whose flowers are not bearded, the stalk shorter than the leaves, with three flowers, and narrow sword-shaped leaves.

12. IRIS corollis imberbibus, caule foliis æqualibus multifloro. Iris whose flowers have no beards, the stalks equal in length with the leaves, with many flowers.

13. IRIS corollis imberbibus, caule foliis longiore multifloro, germinibus sexangularibus, foliis linearibus. Iris whose flowers have no beards, the stalks longer than the leaves, with many flowers, a six-cornered germen, and very narrow leaves.

14. IRIS corollis imberbibus, germinibus sexangularibus, caule tereti, foliis sublinearibus. *Hort. Cliff.* 19. Iris whose flowers have no beards, with a six-cornered germen, a taper stalk, and very narrow leaves.

15. IRIS corollis imberbibus, caule unifloro foliis brevioribus radice fibrosâ. *Flor. Virg.* 10. Iris with an unbearded flower, a stalk shorter than the leaves, with one flower, and a fibrous root.

16. IRIS corollis imberbibus, germinibus subtrigonis, caule tereti, foliis ensiformibus. *Lin. Sp. Plant.* 39. Iris with an unbearded flower, a three-cornered germen, a taper stalk, and sword-shaped leaves.

17. IRIS corollis imberbibus petalis internis longitudine stigmati, foliis ensiformibus. *Hort. Cliff.* 19. Iris with an unbearded flower, the inner petals as long as the stigma, and sword-shaped leaves; called *Stinking Gladwyn*.

18. IRIS corollis imberbibus, germinibus trigonis, caule tereti, foliis linearibus. *Lin. Hort. Cliff.* 19. Iris with an unbearded flower, a three-cornered germen, a taper stalk, and narrow leaves.

19. IRIS corollis imberbibus, foliis tetragonis. *Vir. Cliff.* 6. Iris with an unbearded flower and four-cornered leaves; called *Hermodactyle*.

The first sort grows naturally in ditches and standing waters in most parts of *England*; this is titled in the *Pharmacopœia*, *Acorus adulterinus*, or *Pseudo acorus*, i. e. Bastard *Acorus*. The roots of this are pretty thick, fleshy, and spread near the surface of the ground; the leaves are sword-shaped, very long, of a deep green colour, and not so stiff as those of the garden *Iris*; the stalks rise three feet high, toward the top of which grow three or four flowers, one above another, shaped like the ordinary *Flower-de-luce*, but the three inner petals are shorter than the stigma.

This sort is not cultivated in gardens, but grows wild in standing waters; but being an officinal plant, it is here mentioned to introduce the other.

The second sort grows naturally in *Germany*; the roots of this are very thick, fleshy, and divided into joints, spreading just under the surface of the ground; the leaves arise in clusters embracing each other at their base, but spread afunder upward; they are a foot and a half long, and two inches broad, having sharp edges ending in points like swords; the stalks between these, which are a little longer than the leaves, divide into three branches, each of which produce two or three flowers one above another at distances, inclosed in sheaths; they have three large Violet-coloured petals which turn backward, called falls; these have beards near an inch long on their midrib toward their base, and have a short arched petal which cover the beard, with three broad erect petals of the same colour, called standards; the stamina lie upon the reflexed petals. Under each flower is situated an oblong germen, which turns to a large three-cornered capsule with three cells, filled with large compressed seeds.

There is a variety of this with blue standards and purple falls, which is titled, *Iris hortensis latifolia*, by *Caspar Bauhin*; and one with pale purple standards, another with white, and a third with a smaller flower, but these are accidental varieties which have come from seeds.

The third sort has broader leaves than the second, the flower-stalks have no leaves, but are equal in length with the leaves; they have three or four large, bright, purple flowers, which stand above each other, with purplish sheaths or hoods; the three bending petals or falls, are striped with white from the base to the end of the beard; the flowers are succeeded by large, blunt, triangular capsules with three cells, filled with compressed seeds.

The fourth sort grows naturally in *Hungary*; the leaves of this are like those of the second sort, but are of a darker green; the stalks rise as tall as the leaves, and toward the bottom are garnished with one leaf at each joint, whose base embrace the stalks; the upper part is naked, and branches into three, each having two or three flowers above each other; the three upright petals or standards are yellow, and the bending petals or falls are variegated with purple stripes.

The fifth sort grows naturally near *Constantinople*, and in other parts of the east. The leaves of this sort are not so broad as those of the second, and are of a grayish colour; the stalks rise two feet and a half high, supporting one very large flower; the three upright petals are almost as broad as a hand, but very thin, striped black and white; the three bending petals or falls are of a darker colour, from whence some gardeners have called it the Mourning *Iris*.

The sixth sort hath broad leaves like those of the second sort, but shorter; the stalks rise nine or ten inches high, branching into two or three at the top, each sustaining two deep purple flowers.

The seventh sort hath narrower and shorter leaves than the former; the stalks are shorter than the leaves, and support one flower on the top of a light purple colour. There are two or three varieties of this, which differ in the colour of their flowers.

The eighth sort hath the largest leaves of any of this genus, of a grayish colour and spread wide, embracing each other at the base, where they are purplish. The stalks rise four feet high, and divide into several branches, each supporting three or four flowers above each other at distances, covered with a thin sheath; the three bending petals or falls, of a faint purple inclining to blue, with purple veins running lengthways; the beard is yellow, and the three erect petals or standards are of a bright blue with some faint purple stripes, the flowers have an agreeable scent.

The seeds of the ninth sort were brought from *Carniola*, by the Right Rev. Dr. *Pococke*, Bishop of *Ossory*, who found the plants growing there naturally.

This plant hath a thick fleshy root, divided into many knots or tubers, which spread and multiply in the ground, putting out many strong, thick, fleshy fibres. From these roots arise clusters of flat sword-shaped leaves of a deep green colour, which are more than three feet long, and little more than one inch broad in the broadest part, ending in points; between these arise the flower-stalks, which grow four feet high, having very long spathæ or sheaths at each of the upper joints, which include the flowers. These stalks generally sustain two flowers, which are divided into nine leaves; three of these stand erect, which are white, and six turn down, and are joined together at their base, the lower spreading out into a broad, obtuse, reflexed fall, having a beard, which is of a bright yellow colour; the upper segment is arched over the lower, so as to form a sort of lip, which is reflexed backward; under these is situated an oblong three-cornered germen, which afterward becomes an oblong, swollen, three-cornered seed-vessel, ending in a long point, which opens into three longitudinal cells, in which the seeds are ranged; it is very hardy, and thrives well in the open air without any protection. The roots propagate very fast, when they are in a light moist soil, so that it will soon be common in *England* without waiting for plants from seeds.

The tenth sort grows naturally in *Austria*; this hath narrow, flat, Grass-like leaves about a foot long, of a light green colour; between these arise the stalks about six inches high, having two narrow green leaves, which are much longer than the stalks; these stalks sustain two or three flowers, which are smaller than any of the former species; the petals have no beards, but have a broad yellow line adorned with purple stripes; the three falls are of a light purple colour striped with blue, and have a convex ridge running longitudinally, the other are of a reddish purple variegated with violet; the flowers have a scent like fresh Plums.

The eleventh sort grows naturally near the sea, in the south of *France*, and in *Italy*. This hath narrow sword-shaped leaves more than a foot long, of a deep green colour; the stalks do not rise so tall as the leaves; they sustain at the top two or three flowers which stand near together, of a bright purple colour with very deep falls, the three standards are blue; the bending petals have no beards, but instead of that white broad stripes through the middle.

The twelfth sort hath narrower leaves than the former, but of the same deep green colour; the stalks do not rise higher than the leaves, and support two or three flowers, which have long permanent empalements standing erect, which cover the seed-vessel till the seeds are ripe; the flowers are smaller, and of a paler colour than those of the eleventh sort.

The thirteenth sort has very narrow, long, Grass-like leaves, of a light green; the stalks rise two feet and a half high, sustaining three or four flowers above each other, which have blue falls, and purple standards striped with pale blue lines.

The fourteenth sort grows naturally in *Germany*; the leaves are like those of the eleventh sort, which, when broken, have a disagreeable scent; but this is accidental, and not common to all the plants; the stalks of this are taper, and rise a little above the leaves, sustaining three or four flowers one above another, which have light blue standards, and purple variegated falls without beards; instead of which, they have a broad white line in the middle; these are succeeded by short thick capsules, which have scarce any angles, opening in three cells, which are filled with angular seeds.

The fifteenth sort grows naturally in *North America*; this hath tufted fibrous roots, from which arise many narrow sword-shaped leaves; from between these come out the stalks, which are shorter than the leaves, supporting one purple flower with blue standards.

The sixteenth sort grows also in *North America*; this hath broader sword-shaped leaves than the former, of a light green colour; the stalks rise a little above the leaves, and support two or three flowers one above another; the standards are of a light blue, the falls are purple variegated, with a broad white line instead of a beard through the middle.

The seventeenth sort grows naturally in moist places in many parts of *England*, so is seldom admitted into gardens. This hath thick, tufted, fibrous roots, the leaves are of a Grass green colour, sword-shaped, and when broken emit a strong odour, not much unlike that of hot roast beef at the first scent, but if smelt too close, becomes disagreeable. It is generally called Stinking Gladwyn in *England*; the stalks rise about the same height with the leaves, supporting two small flowers of a purple colour, variegated.

The eighteenth sort grows naturally in *Austria* and *Bohemia*; this hath narrow sword-shaped leaves near a foot and a half long, of a dark green colour; the flower-stalks rise above the leaves, and support two or three flowers with light blue standards, and deep blue falls, with a broad stripe of white, instead of the beard.

All these sorts are generally propagated by parting of their roots, which do most of them multiply fast enough. The best time to remove and part the roots is in autumn, that they may get good root before the spring, otherwise they will not flower strong the following summer. All those sorts which spread much at their roots, should be transplanted every other year, to keep them within bounds, otherwise they will spread so much as to become troublesome, especially if they are planted near other flowers; indeed the large growing kinds are most of them too spreading for the flower-garden, so are only fit to fill up the spaces between trees and shrubs in large plantations, where they will have a good effect during the time of their flowering.

The fifth, sixth, seventh, tenth, eleventh, and thirteenth sorts, grow in less compass, so may be admitted into large borders, or in clumps of flowers in the pleasure-garden, where they will add to the variety. The fifth sort should have a warmer situation, being a little tender, but all the other sorts will grow in almost any soil or situation, and may be propagated by seeds, which should be sown soon after they are ripe, then the plants will come up the following spring; but if the seeds are sown in the spring, they will lie a year in the ground before they vegetate; but as most of the sorts are so easily propagated by their roots, few people care to wait for seeding plants, unless of those sorts which are scarce.

The nineteenth sort grows naturally in the islands of the *Archipelago*; this hath a tuberous knobbed root, from which arise five or six long, narrow, four-cornered leaves, between which arise the stalk, which supports one flower, shaped like those of the Iris, but small, and of a dark purple colour. This is propagated by the roots, which send out off-

sets, which may be taken up, and transplanted when their leaves decay, but should not be kept too long out of the ground. If these are planted in a deep loose soil, the roots will run down, and be lost in a few years where they are not disturbed, so they should be annually transplanted, and have a shallow soil; they are hardy in respect to cold, and require no farther care but to keep them clean from weeds.

IRIS Bulbosa. } See Xiphium.
IRIS Persica. }

ISATIS. *Tourn. Inst. R. H. 211. tab. 100.* Woad.

The Characters are,

The empalement of the flower falls away; the flower hath four oblong petals, placed in form of a cross. It hath six stamens, four of which are as long as the petals, the other two are shorter, with an oblong compressed germen, which becomes an oblong compressed pod, with one cell, opening with two valves, inclosing one oval compressed seed in the center.

The Species are,

1. ISATIS foliis radicalibus oblongo-ovatis obtusis integerrimis, caulinis sagittatis filiculis oblongis. Woad with oblong, oval, blunt, entire leaves at bottom, but those on the stalks arrow-pointed, and oblong pods; or cultivated Woad.

2. ISATIS foliis radicalibus lanceolatis integerrimis, caulinis sagittatis, filiculis angustioribus. Woad with spear-shaped entire lower leaves, those on the stalks arrow-shaped, and narrower pods; wild narrow-leaved Woad.

3. ISATIS foliis radicalibus crenatis, caulinis sagittatis, filiculis angustioribus villosis. Woad with crenated lower leaves, those on the stalks arrow-pointed, and narrow hairy pods; smaller *Portugal* Woad.

The first sort is cultivated in several parts of *England*, for the purposes of dying, being used as a foundation for many of the dark colours.

This is a commodity well worth propagating in all places where the land is suitable for it, which must be a pretty strong soil, but not too moist.

The plant is biennial, in which it differs from most of the others sorts, which are annual. The lower leaves of this are of an oblong oval figure, and pretty thick consistence, and end in obtuse roundish points; they are entire on their edges, and of a lucid green. The stalks rise four feet high, dividing into several branches, garnished with arrow-shaped leaves, sitting close to the stalks; the branches are terminated by small yellow flowers, in very close clusters, which are composed of four small petals, placed in form of a cross, which are succeeded by pods shaped like a bird's tongue, which, when ripe, turn black, and open with two valves, having one cell, in which is situated a single seed.

The second sort has been supposed to be the same species as the first, and only differing by culture; but I have propagated both sorts more than thirty years, and have not found either of them alter.

The third sort grows naturally in *Portugal*; it is an annual plant, whose lower leaves are narrow and crenated, but those on the stalks are arrow-pointed; they are of a pale green, and much thinner than those of the other sorts. The flowers are small, of a sulphur colour, and the seed-vessels are narrow and hairy.

The two last sorts are not cultivated for use, so are only preserved in botanick gardens for the sake of variety; they are propagated by seeds as the first sort.

The first sort which is propagated for use, is sown upon fresh land which is in good heart, for which the cultivators of Woad pay a large rent; they generally chuse to have their land situated near great towns, where there is plenty of dressing, but they never stay long on the same spot, for the best ground will not admit of being sown with Woad more than twice, and if it is oftener repeated, the crop seldom pays the charges of culture, &c.

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Those who cultivate this commodity have gangs of people who have been bred to this employment, so that whole families travel about from place to place, where-ever their principal fixes on land for the purpose; but these people go on in one track, just as their predecessors taught them, nor have their principals deviated much from the practice of their ancestors, so that there is a large field for improvement, if any of the cultivators of Woad were persons of genius, and could be prevailed on to introduce the garden culture so far as it may be adapted to this plant; this I know from experience, having made numbers of trials on the culture of this plant, therefore I shall insert them here, for the benefit of those who may have ingenuity enough to strike out of the old beaten track.

As the goodness of Woad consists in the size and fatness of the leaves, the only method to obtain this, is by sowing the seed upon ground at a proper season, and allow the plants proper room to grow, as also to keep them clean from weeds, which, if permitted to grow, will rob the plants of their nourishment. The method practised by some of the most skilful kitchen-gardeners in the culture of Spinach, would be a great improvement to this plant, for some of them have improved the round-leaved Spinach so much by culture, as to have the leaves more than six times the size they were formerly, and their fatness has been in the same proportion, though sown upon the same land as formerly; which has been effected by thinning of the plants when young, and keeping the ground constantly clean from weeds; but to return to the culture of Woad.

After having made choice of a proper spot of land, which should not be too light and sandy, nor over stiff and moist, but rather a gentle hazel loam, whose parts will easily separate, the next is to plough this up just before winter, laying it in narrow high ridges, that the frost may penetrate through the ridges, to mellow and soften the clods; then in the spring plough it again crossway, laying it again in narrow ridges; after it has lain some time in this manner, and the weeds begin to grow, it should be well harrowed to destroy them; this should be twice repeated while the weeds are young, and if there are any roots of large perennial weeds, they must be harrowed out, and carried off the ground. In *June* the ground should be a third time ploughed, when the furrows should be narrow, and the ground stirred as deep as the plough will go, that the parts may be as well separated as possible, and when the weeds appear again, the ground should be well harrowed to destroy them. Toward the end of *July*, or the beginning of *August*, it should be ploughed the last time, when the land should be laid smooth, and when there is a prospect of showers, the ground must be harrowed to receive the seeds, which should be sown either in rows with the drill plough, or in broad-cast after the common method; but it will be proper to steep the seeds one night in water before they are sown, which will prepare them for vegetation; if the seeds are sown in drills, they will be covered by an instrument fixed to the plough for that purpose, but those which are sown broad-cast in the common way, must be well harrowed in. If the seeds are good, and the season favourable, the plants will appear in a fortnight, and in a month or five weeks after will be fit to hoe; for the sooner this is performed when the plants are distinguishable, the better they will thrive, and the weeds being then young, will be soon destroyed. The method of hoeing these plants, is the same as for Turneps, with this difference only, that these plants need not be thinned so much, for at the first hoeing, if they are separated to the distance of four inches, and at the last to six inches, it will be space enough for the growth of the plants; if this is carefully performed, and in dry weather, most of the weeds will be destroyed, but as some of them may escape in this

operation, and young weeds will arise, so the ground should be a second time hoed in *October*, always choosing a dry time for this work; at this second operation, the plants should be singled out to the distance they are to remain. After this the ground will be clean from weeds till the spring, when young weeds will come up, therefore about the end of *March* will be a good time to hoe the ground again, for while the weeds are young, it may be performed in less than half the time it would require if the weeds were permitted to grow large, and the sun and wind will much sooner kill them; this hoeing will also stir the surface of the ground, and greatly promote the growth of the plants; if this is performed in dry weather, the ground will be clean till the first crop of Woad is gathered, after which it must be again well cleaned; if this is carefully repeated, after the gathering each crop, the land will always lie clean, and the plants will thrive the better. The expence of the first hoeing will be about six shillings per acre, and for the after hoeings half that price will be sufficient, provided they are performed when the weeds are young, for if they are suffered to grow large, it will require more labour, nor can it be so well performed; therefore it is not only the best husbandry to do this work soon, but it will be found the cheapest method; for the same number of men will hoe a field of ten acres three times when it is done in time, as is required to hoe it twice only, because the weeds will have longer time to grow between the operations.

If the land, in which this seed is sown, should have been in culture before for other crops, so not in good heart, it will require dressing before it is sown, in which case rotten stable-dung is preferable to any other, but this should not be laid on till the last ploughing before the seeds are sown, and not spread till the land is ploughed, that the sun may not exhale the goodness of it, which in summer is soon lost when spread on the ground. The quantity should not be less than twenty loads to each acre, which will keep the ground in heart till the crop of Woad is spent.

The time for gathering of the crop is according to the season, but it should be performed as soon as the leaves are fully grown, while they are perfectly green, for when they begin to change pale, great part of their goodness is over, for the quantity will be less, and the quality greatly diminished.

If the land is good, and the crop well husbanded, it will produce three or four gatherings, but the two first are the best; these are commonly mixed together in the manufacturing of it, but the after crops are always kept separate, for if these are mixed with the other the whole will be of little value. The two first crops will sell from twenty-five to thirty pounds a ton, but the latter will not bring more than seven or eight pounds, and sometimes not so much. An acre of land will produce a ton of Woad, and in good seasons near a ton and a half.

When the planters intend to save the seeds, they cut three crops of the leaves, and then let the plants stand till the next year for seed; but if only one crop is cut, and that only of the outer leaves, letting all the middle leaves stand to nourish the stalks, the plants will grow stronger, and produce a much greater quantity of seeds.

These seeds are often kept two years, but it is always best to sow new seeds when they can be obtained. The seeds ripen in *August*, when the pods turn to a dark colour the seeds should be gathered; it is best done by reaping the stalks in the same manner as Wheat, spreading the stalks in rows upon the ground, and in four or five days the seeds will be fit to thresh out, provided the weather is dry; for if it lies long, the pods will open and let out the seeds.

There are some of the Woad planters, who feed down the leaves in winter with sheep, which is a very bad method,

thod, for all plants which are to remain for a future crop, should never be eaten by cattle, for that greatly weakens the plants, therefore those who eat down their Wheat in winter with sheep, are equally blameable.

ISOPYRUM. *Lin. Gen. Plant.* 621.

The Characters are,

The flower has no empalement. It hath five oval petals, and five short tubulous nectariums, situated within the petals. It hath a great number of short hairy stamina, and several oval germen, which afterward become so many recurved capsules with one cell, filled with small seeds.

The Species are,

1. ISOPYRUM *stipulis subulatis, petalis acutis.* Hort. Upsal. 157. Isopyrum with awl-shaped stipulæ, and acute petals.
2. ISOPYRUM *stipulis ovatis, petalis obtusis.* Lin. Sp. Plant. 557. Isopyrum with oval stipulæ, and obtuse petals.
3. ISOPYRUM *stipulis obsoleteis.* Lin. Sp. Plant. 557. Isopyrum with obsolete stipulæ.

The first sort grows naturally in Siberia; this is an annual plant, which seldom rises more than three or four inches high. The leaves are shaped like those of Fumitory. The stalk is naked to the top, where there is a circle of leaves just under the flowers. The flowers are small, of an herbaceous colour on their outside, but yellow within, having five acute petals, and as many honey glands, with a great number of stamina which are shorter than the petals, and several reflexed moon-shaped germen. The flowers are succeeded by many recurved seed-vessels with one cell, filled with small shining black seeds.

The seeds of this plant should be sown in a shady border soon after they are ripe, for when they are kept long out of the ground, they seldom grow the first year; therefore, when the seeds are permitted to scatter, they succeed very well, and require no other care but to keep them clean from weeds: as there is no great beauty in this plant, so a small patch or two of them in any shady part of the garden, by way of variety, will be sufficient.

The second and third sorts grow naturally about Verona. The second sort hath leaves very like those of the smallest meadow Rue. The stalks rise four or five inches, supporting a few small white flowers, with obtuse petals; these are succeeded by several recurved seed-vessels, containing many small seeds.

The third sort hath leaves like the second, but a little larger, and of a greener colour. The stalks rise about six inches high, supporting two or three small white flowers, shaped like those of the second sort, which are succeeded by recurved seed-vessels, filled with small seeds.

Both these plants delight in a moist shady situation; they are propagated by seeds in the same way as the first sort, but these will live two or three years.

ISORA. See Helicteres.

ITEA. *Lin. Gen. Plant.* 243.

The Characters are,

The empalement of the flower is small and permanent, ending in five acute points. The flower has five petals, which are inserted in the empalement. It hath five awl-shaped stamina inserted in the empalement, and an oval germen, which afterward becomes a long oval capsule, with the style at the top, having one cell filled with small seeds.

We have but one Species of this genus, viz.

ITEA. *Flor. Virg.* 143.

This shrub grows in several parts of North America, by the sides of rivers, and in other moist land, where it rises to the height of eight or ten feet, sending out many branches from the ground upward, garnished with spear-shaped leaves, placed alternately, and slightly sawed on their edges, of a light green. At the extremity of the same year's shoots, are produced fine spikes of white flowers, three or

four inches long, standing erect; when these shrubs are in vigour, they will be entirely covered with these spikes of flowers, so that they make a fine appearance at their season of flowering, which is in July.

This shrub thrives well in the open air in England, the cold never injuring it; but upon dry gravelly ground, it is very apt to die in the summer, in a dry season. It is propagated by layers, but these should be made of young shoots of the same year, for the old branches do not put out roots very kindly. The shoots should be laid down in the autumn, and will be rooted in one year.

JUDAICA ARBOR. See Cercis.

JUGLANS. *Lin. Gen. Plant.* 950. Walnut.

The Characters are,

It hath male and female flowers at distances on the same tree. The male flowers are disposed in an oblong cylindrical katkin; each scale has one flower, with one petal, divided into six equal parts; in the center is situated many short stamina. The female flowers grow in small clusters, sitting close to the branches; these have short, erect, four-pointed empalements, sitting on the germen, and an acute erect petal, divided into four parts. Under the empalement sits a large oval germen, which afterward becomes a large oval dry berry, with one cell, inclosing a large oval nut with netted furrows.

The Species are,

1. JUGLANS *foliolis ovalibus glabris subserratis subæqualibus.* Hort. Cliff. 449. Walnut with oval lobes, which are smooth, sawed, and equal.

2. JUGLANS *foliolis lanceolatis acutè serratis, intermediis majoribus.* Black Virginia Walnut.

3. JUGLANS *foliolis cordato-lanceolatis infernè nervosis, pediculis foliorum pubescentibus.* Black Virginia Walnut, with an oblong fruit very deeply furrowed.

4. JUGLANS *foliolis lanceolatis serratis, exterioribus latioribus.* Lin. Sp. Plant. 997: White Virginia Walnut; or Hickery nut.

5. JUGLANS *foliolis cuneiformibus serratis, exterioribus majoribus.* White Walnut with a smaller fruit, and a smooth bark.

6. JUGLANS *foliolis lanceolatis serratis glabris subæqualibus.* White Walnut with an oval compressed fruit, a sweet kernel, and a scaly bark; commonly called Shagbark in America.

There are several varieties of the common Walnut, which are distinguished by the following titles: the large Walnut, the thin-shelled Walnut, the French Walnut, the late-ripe Walnut, and the double Walnut, but these do all of them vary when raised by seeds, so that the nuts from the same tree will produce plants, whose fruit will differ, therefore there can be no dependence upon the trees which are raised from nuts, till they have produced fruit; so that those persons who plant the trees for their fruit, should make choice of them in the nurseries when they have their fruit upon them, otherwise they may be deceived by having such as they would not choose.

The second sort is commonly called Black Virginia Walnut; this grows to a large size in North America. The leaves of this sort are composed of five or six pair of spear-shaped lobes, which end in acute points, and are sawed on their edges; the lower pair of lobes are the least, the other gradually increase in their size to the top, where the pair at the top, and the single lobe which terminates the leaf, are smaller; these leaves, when bruised, emit a strong aromatic flavour, as do also the outer cover of the nuts, which are rough, and rounder than those of the common Walnut. The shell of the nut is very hard, thick, and the kernel small, but very sweet.

The third sort grows naturally in North America, where the trees grow to a large size. The leaves of this sort are composed

composed of seven or eight pair of long heart-shaped lobes, broad at their base, where they are divided into two round ears, but terminate in acute points; they are rougher, and of a deeper green than those of the second sort, and have nothing of the aromattick scent which they have. The fruit is very long. The shell is deeply furrowed, and hard. The kernel is small, but well flavoured.

The fourth sort is very common in most parts of *North America*, where it is called Hickery nut. The leaves of this sort are composed of two or three pair of oblong lobes, terminated by an odd one; these are of a light green, sawed on their edges; the lower pair of lobes are the smallest, and the upper the largest. The fruit is shaped like the common Walnut, but the shell is not furrowed, and is of a light colour.

The fifth sort is not so large as the fourth. The leaves are composed of two pair of lobes, terminated by an odd one; these are narrow at their base, but broad and rounded at their ends; they are sawed on their edges, and of a light green. The nuts are small, and have a very hard smooth shell.

The sixth sort grows naturally in *North America*, where it rises to a middling stature. The leaves of this sort are composed of three pair of smooth spear-shaped lobes, of a dark green colour, sawed on their edges, ending in acute points. The fruit is oval, the shell white, hard, and smooth; the kernel small, but very sweet. The young shoots of the tree are covered with a very smooth brownish bark, but the stems and older branches have a rough scaly bark, from whence it had the appellation of Shagbark, in *America*.

The common Walnut is propagated in many parts of *England* for the fruit, and formerly the trees were propagated for their wood, which was in very great esteem, till the quantity of Mahogany, and other useful woods which have been of late years imported into *England*, have almost banished the use of Walnut.

The trees are propagated by planting of their nuts, which, as was before observed, seldom produce the same sort of fruit as was sown; so that the only way to have the desired sort, is to sow the nuts of the best kinds; and if this is done in a nursery, the trees should be transplanted out when they have had three or four years growth, to the place where they are designed to remain, for these trees do not bear transplanting when they are of a large size; therefore there may be a good number of the trees planted, which need not be put at more than six feet apart, which will be distance enough for them to grow till they produce fruit, when those whose fruit are of the desired kind may remain, and the others cut up, to allow them room to grow; by this method a sufficient number of the trees may be generally found among them to remain, which will thrive and flourish greatly when they have room; but as many people do not care to wait so long for the fruit, so the next best method is to make choice of some young trees in the nurseries when they have their fruit upon them; but though these trees will grow and bear fruit, yet they will never be so large or so long lived, as those which are planted young.

All the sorts of Walnuts which are propagated for timber, should be sown in the places where they are to remain; for the roots of these trees always incline downward, which being stopped or broken, prevent their aspiring upward, so that they afterwards divaricate into branches, and become low spreading trees; but such as are propagated for fruit, are greatly mended by transplanting; for hereby they are rendered more fruitful, and their fruit are generally larger and fairer; it being a common observation, that downright roots greatly encourage the luxuriant growth of

timber in all sorts of trees, but such trees as have their roots spreading near the surface of the ground, are always the most fruitful.

The nuts should be preserved in their outer covers in dry sand until *February*, when they should be planted in lines, at the distance you intend them to remain; but in the rows they may be placed pretty close, for fear the nuts should miscarry; and the young trees, where they are too thick, may be removed, after they have grown two or three years, leaving the remainder at the distance they are to stand.

In transplanting these trees, you should always observe never to prune either their roots or large branches, both which are very injurious to them; nor should you be too busy in lopping or pruning the branches of these trees while growing, for it often causes them to decay; but when there is a necessity of cutting any of their branches off, it should be done early in *September*, that the wound may heal over before the cold increases; and the branches should always be cut off quite close to the trunk, otherwise the stump which is left will decay, and rot the body of the tree.

The best season for transplanting these trees is as soon as the leaves begin to decay, at which time if they are carefully taken up, and their branches preserved entire, there will be little danger of their succeeding, although they are eight or ten years old; though, as was before observed, these trees will not grow so large, or continue so long, as those which are removed young.

This tree delights in a firm, rich, loamy soil, or such as is inclinable to chalk or marl; and will thrive very well in stony ground, and on chalky hills, as may be seen by those large plantations near *Leatherhead*, *Godstone*, and *Carshalton* in *Surry*, where are great numbers of these trees planted upon the downs, which annually produce large quantities of fruit, to the great advantage of their owners; one of which I have been told, farms the fruit of his trees, to those who supply the markets for 30*l.* per annum.

The distance these trees should be placed, ought not to be less than forty feet, especially if regard be had to their fruit; though when they are only designed for timber, if they stand near, it promotes their upright growth. The black *Virginia* Walnut is much more inclinable to grow upright than the common sort, and the wood being generally of a more beautiful grain, renders it preferable to that, and better worth cultivating. I have seen some of this wood which hath been beautifully veined with black and white, which, when polished, has appeared at a distance like veined marble. This wood was some years past greatly esteemed by the cabinet-makers for inlaying, for tables, and cabinets, and is a durable wood for those purposes, being less infected with insects of any kind, than most others of *English* growth (which may proceed from its extraordinary bitterness;) but it is not proper for buildings of strength, it being of a brittle nature, and exceeding subject to break very short, though it commonly gives notice thereof, by its cracking some time before it breaks.

The general opinion, that the beating down this fruit improves the trees, I do not believe, since in the doing of this, the younger branches are generally broken and destroyed; but as it would be exceeding troublesome to gather it by hand, so in beating it off, great care should be taken that it be not done with violence, for the reason before assigned. In order to preserve the fruit, it should remain upon the trees till it is thoroughly ripe, and drops from the trees, then laid in heaps for two or three days, when their husks will easily part from the shells: then dried well in the sun, and laid up in a dry place, where mice or other vermin cannot come to them, where they will remain

good four or five months; but there are some persons who put their Walnuts into an oven gently heated, where they let them remain four or five hours to dry, and then put them up in oil jars, or any other close vessel, mixing them with dry sand, by which method they will keep good six months. The putting of them in the oven is to dry the germ, and prevent their sprouting; but if the oven be too hot it will cause them to shrink, therefore great care must be had to that.

All the other sorts are propagated in the same way as the common Walnut, but as few of the sorts produce fruit in *England*, so their nuts must be procured from *North America*; which should be gathered when fully ripe, and put up in dry sand, to preserve them in their passage to *England*: when they arrive here, the sooner they are planted, the greater chance there will be of their succeeding; when the plants come up, they should be kept clean from weeds; and if they shoot late in the autumn, and their tops are full of sap, they should be covered with mats, to prevent the early frost from pinching their tender shoots, which often causes them to die down a considerable length before spring; but if they are screened from these early frosts, the shoots will become firmer and better able to resist the cold. Some of these sorts are tender while young, so require a little care the two first winters, but afterward will be hardy enough to resist the greatest cold of this country.

The black *Virginia* Walnut is full as hardy as the common sort; there are some large trees of this kind in the *Chelsea* garden, which have produced great quantities of fruit upward of forty years; the nuts have generally ripened so well there as to grow, but their kernels are small, so are of little value.

These trees all require the same culture as the common Walnut, but they grow best in a soft loamy soil not too dry, and where there is a depth of soil for their roots to run down. The Hickery when young, is very tough and pliable, so the sticks of it are much esteemed; but the wood when grown large, is very brittle, so not of any great use. The black *Virginia* Walnut is the most valuable wood of all the sorts; some of the trees are beautifully veined, and will take a good polish, but others have very little beauty, which is the case of many other sorts of wood.

JUJUBE. See *Ziziphus*.

JULIANS, or ROCKETS. See *Hesperis*.

JULY FLOWER. See *Dianthus*.

JUNCUS. *Tourn. Inst. R. H.* 246. *tab.* 127. *Rusii*.

The Characters are,

It hath a chaff opening with two valves, an empalement with six oblong pointed leaves; the flower hath no petals, but the coloured empalement is by some taken for petals. It hath six short hairy stamina, and a three-cornered germen, which afterward becomes a three-cornered capsule with one cell, opening with three valves, inclosing roundish seeds.

The Species are,

1. *JUNCUS culmo subnudo tereti mucronato, panicula terminali, involucro diphylo spinoso. Lin. Sp. Plant.* 325. Prickly large Sea Rush.

2. *JUNCUS culmo nudo, apice membranaceo incurvo, panicula laterali. Lin. Sp. Plant.* 326. Common hard Rush.

3. *JUNCUS culmo nudo striato, panicula laterali. Flor. Leyd.* 44. Larger common soft Rush, with a spreading panicle.

4. *JUNCUS culmo nudo striato, capitulo laterali. Prod. Leyd.* 44. Soft Rush, with a more compact panicle.

There are many other species of this genus which grow naturally in *England*, and are very troublesome weeds in many pastures, so are not worthy of being enumerated here; for those here mentioned, is only to point out a method of destroying them.

The first and second sorts grow on the sea-shores, where-

they are frequently watered by the salt water. These two sorts are planted with great care on the banks of the sea in *Holland*, in order to prevent the water from washing away the earth; which being very loose, would be in danger of removing every tide, if it were not for the roots of these Rushes, which fasten themselves very deep in the ground, and mat themselves near the surface, so as to hold the earth closely together. Therefore, whenever the roots of these Rushes are destroyed, the inhabitants immediately repair them to prevent farther damage. In the summer time, when the Rushes are fully grown, the inhabitants cut them, and tie them up into bundles, which are dried, and afterward carried into the larger towns and cities, where they are wrought into baskets, and several other useful things, which are frequently sent into *England*. These sorts do not grow so strong in *England*, as they do on the *Marse*, and some other places in *Holland*, where I have seen them upward of four feet high.

The third and fourth sorts grow on moist, strong, uncultivated lands in most parts of *England*, and consume the herbage where they are suffered to remain. The best method of destroying these Rushes is, to fork them up clean by the roots in *July*, and after having let them lie a fortnight or three weeks to dry, lay them in heaps, and burn them gently; and the ashes which these afford, will be tolerable manure for the land; but in order to prevent their growing again, and to make the pasture good, the land should be drained, otherwise there will be no destroying these Rushes entirely; but after it is well drained, if the roots are annually drawn up, and the ground kept duly rolled, they may be subdued.

JUNIPERUS. *Tourn. Inst. R. H.* 588. *tab.* 361. Juniper.

The Characters are,

It hath male and female flowers in different plants, and sometimes at separate distances on the same plant. The male flowers have a conical katkin; the flowers are placed by threes opposite, and terminated by a single one; the scales are broad, lying on each other, and fixed to the column by a very short foot-stalk. The flower has no petal, but three stamina, joined in one body below. The female flowers have a small three-pointed empalement, sitting upon the germen; they have three stiff, acute, permanent petals; the germen sitting below the empalement, afterward becomes a roundish berry, inclosing three stony seeds which are oblong, angular on one side, but convex on the other.

The Species are,

1. *JUNIPERUS foliis ternis patentibus mucronatis. Lin. Sp. Plant.* 1040. The common *English* Juniper.

2. *JUNIPERUS foliis ternis patentibus, longioribus acutioribusque, ramis erectioribus.* The tree, or *Swedish* Juniper.

3. *JUNIPERUS foliis ternis omnibus patentibus.* Cedar of *Virginia*, or red Cedar.

4. *JUNIPERUS foliis ternis basi aduatis, junioribus imbricatis, senioribus patulis. Hort. Cliff.* 464. Commonly called *Carolina* Cedar.

5. *JUNIPERUS foliis inferioribus ternis patentibus, superioribus quadrifariam imbricatis.* Commonly called Cedar of *Bermudas*.

6. *JUNIPERUS foliis ternis patentibus, subulatis acutis.* Great Juniper with blue berries.

7. *JUNIPERUS foliis inferioribus ternis brevioribus patentibus, superioribus imbricatis acutis.* Greater Juniper, or Cedar with a Cypress leaf and yellowish fruit.

8. *JUNIPERUS foliis undique imbricatis ovatis obtusis. Flor. Leyd.* 90. Middle Juniper, or Cedar with a Cypress leaf and larger berries.

9. *JUNIPERUS foliis omnibus quadrifariam imbricatis.* Greatest Juniper, with a Cypress leaf; commonly called *Jamaica* berry-bearing Cedar.

10. JUNIPERUS foliis oppositis erectis decurrentibus, ramis patulis. Common Savin.

11. JUNIPERUS foliis oppositis patulis, decurrentibus, ramis erectioribus. Upright berry-bearing Savin.

12. JUNIPERUS foliis undique imbricatis obtusis, ramis teretibus. Greater Juniper with a brownish berry.

13. JUNIPERUS foliis quadrisariam imbricatis acutis. Prod. Leyd. 90. Taller Spanish Cedar, with a very large black fruit.

The first sort grows naturally upon chalky lands, in many parts of *England*. This is a low shrub, seldom rising more than three feet high, sending out many spreading branches, covered with a brown bark, garnished with narrow awl-shaped leaves, ending in acute points, placed by threes round the branches, which are of a grayish colour, and continue through the year; the male flowers sometimes are situated at distances on the same plant with the female, at other times they are upon distinct plants: the female flowers are succeeded by roundish berries which are first green, but when ripe, are of a dark purple colour. The berries ripen in the autumn.

The wood, the berries, and the gum are used in medicine; the gum is titled sandaracha.

The second sort is known in the gardens by the title of *Swedish* Juniper; this is by many supposed to be only a variety of the first, but is undoubtedly a distinct species, for I have many years raised both sorts from the seeds, and have never found them alter. This rises to the height of ten or twelve feet, the branches grow more erect, the leaves are narrower, and end in more acute points; they are placed farther asunder on the branches, and the berries are larger. It grows naturally in *Sweden*, *Denmark*, and *Norway*.

The third sort grows naturally in most parts of *North America*, where it is called red Cedar, to distinguish it from a sort of Cypress, which is there called white Cedar. Of this there are two, if not three varieties, besides the species here enumerated; one of which has leaves in every part like those of the Savin, and upon being rubbed, emit a very strong ungrateful odour, and is commonly distinguished in *America*, by the title of Savin tree. There is another with leaves very like those of Cypress, but as these generally arise from the same seeds when they are sent from *America*, so they are only feminal variations.

The lower leaves of the fourth sort are like those of the *Swedish* Juniper, but the upper leaves are like those of the Cypress; and this difference is constant, when the seeds are carefully gathered from the same tree; but as most of those people who send over these seeds, are not very careful to distinguish the difference, so it often happens that the seeds of two or three sorts are mixed together, which has given occasion to people to imagine them but one; but all the leaves of the third are like those of the Juniper, so the gardeners call that the red *Virginia* Cedar, and this *Carolina* Cedar, though they grow naturally in *Virginia*.

The fifth sort is the *Bermudas* Cedar, whose wood has a very strong odour; it was formerly in great esteem for wainscoting of rooms, and also for furniture, but the odour being too powerful for many persons, has rendered it less valuable, so at present there is not much of it imported into *England*. These plants, while young, have acute-pointed leaves, which spread open, and are placed by threes round the branches; but as the trees advance, so their leaves alter, and the branches are four-cornered; the leaves are very short, and placed by fours round the branches, lying over each other like the scales of fish; the berries are produced toward the end of the branches, these are of a dark red colour, inclining to purple. As there are few of these trees of any great size in *England*, so I have not had an oppor-

tunity of examining their flowers, therefore do not know if they are on different plants; for although I have received very fine specimens from *Bermudas*, yet they were all with fruit on them almost fully grown, and not one with flowers: as these trees are commonly destroyed in *England* whenever there happens a severe winter, we have little hopes of seeing them in flower here.

The sixth sort grows naturally in *Isria*. This hath spreading branches growing thinly, garnished with awl-shaped acute pointed leaves, placed by threes, of a dark green, and not very close to each other; they grow horizontally, pointing outward; the berries are much larger than those of the common Juniper, and are blue when ripe.

The seventh sort grows naturally in *Portugal*. This sort grows with its branches in a pyramidal form, the lower ones are garnished with short, acute-pointed, grayish leaves, placed by threes, pointing outward; but those on the upper branches are of a dark green, lying over each other like the scales of fish, ending in acute points. The male flowers are produced at the extremity of the branches, they are situated in a loose, scaly, conical katkin, standing upon a short foot-stalk erect; the fruit is produced sometimes upon the same tree, at distances from the flowers, and at other times they are upon separate trees; the berries of this are of a pale yellow when ripe, and about the size of those of the common Juniper.

The eighth sort grows naturally in *Spain* and *Italy*. The branches of this sort grow erect, and are covered with a brown bark; the leaves are small, obtuse, and lie over each other like the scales of fish; the male flowers grow at the extremity of the branches in a conical katkin, and the fruit grows single from the side of the branches below the katkins on the same branch; the berries are large, oval, and, when ripe, are brown.

The ninth sort grows naturally in *Jamaica*, and also in the other islands of the *West-Indies*, where it rises to be one of the largest timber trees in those countries; the wood is frequently fetched from thence by the inhabitants of *North America*, for building of ships. This is generally confounded with the *Bermudas* Cedar, and taken from the same, but the specimens of it which were sent by the late Dr. *Houssoun*, prove them to be different trees; for the branches of this spread wide, the leaves are extremely small, and are every where lying imbricatum over each other; the bark is rugged, and splits off in strings, and is of a very dark colour; the berries are smaller than those of the *Bermudas* Cedar, and are of a light brown colour when ripe.

The tenth sort is the common Savin; this grows naturally in *Italy*, *Spain*, and the *Levant*, upon the mountains where it is cold. It sends out its branches horizontally, so seldom rises more than three or four feet high; the branches are garnished with very short acute-pointed leaves placed opposite, and their ends point upward. This sort very rarely produces either flower or seed, when it is transplanted into gardens; the berries are smaller than those of the common Juniper, but of the same colour, and a little compressed; the whole plant has a very rank strong odour when touched. The leaves of this are much used by the farriers for horses when they have worms, and Mr. *Roy* commends the juice of it mixed with milk, and sweetened with sugar, as an excellent medicine for children who are troubled with worms.

The eleventh sort has, by many, been supposed to be only an accidental variety of the former, but there is a manifest difference between them; for the branches of this grow more erect, the leaves are shorter, and end in acute points which spread outward. This will rise to the height of eight or ten feet, and produces great quantities of berries. I have propagated this sort from seeds, but have ne-

ver found it vary. It has been distinguished by most of the old botanists, by the title of berry-bearing Savin. It grows naturally on the *Alps*.

The twelfth sort grows naturally in *Spain*, *Portugal*, and the south of *France*, where it rises ten or twelve feet high, sending out small taper branches without angles, the whole length of the stem, garnished with small obtuse leaves, lying over each other like the scales of fish; the male flowers are situated at the end of the branches in conical scaly katkins, and the berries grow below from the side of the same branches. These are larger than those of the common Juniper, and when ripe are brown.

The thirteenth sort grows naturally in *Spain* and *Portugal*, where it rises from twenty-five to thirty feet high, sending out many branches which form a pyramid, garnished with acute-pointed leaves which lie over each other four ways, so as to make the branches four-cornered; the berries of this sort are very large, and black when ripe.

These plants are all propagated by seeds, which should be sown as soon as they are ripe, if they can be procured; for when they are kept out of the ground till spring, they will not come up until the second year. The hardy sorts may be sown on a border exposed to the east, sifting some earth over them about half an inch thick; toward the middle or latter end of *April*, some of the plants will appear above ground, though perhaps part of them may lie till the spring following before they come up, therefore should not be disturbed till after that time; for as these plants which come up the first season, will not make great progress while they are young, so they will not require moving till after two summers growth. The second autumn after sowing some beds must be prepared to transplant them into, which should be of fresh undunged soil, well dug and cleansed from all noxious weeds and roots; then in the beginning of *October*, which is the proper season for removing these plants, they should be raised up with a trowel, preserving as much earth as possible to their roots, and planted into the beds about five or six inches asunder each way, giving them some water to settle the earth to their roots; and if it should prove very dry weather, this should be repeated two or three times. As some of the seeds may yet remain in the ground, so the beds should not be disturbed too much in taking up the plants; for I have known a bed sown with these berries, which has supplied plants for three years drawing, some of the berries having lain two years in the ground before they sprouted; therefore the surface of the beds should be kept level, and constantly clean from weeds.

The plants may remain two years in the beds after planting, observing to keep them clear from weeds; in the spring the ground should be gently stirred between them, that their roots may with greater ease strike into it; after which time they should be transplanted, either into a nursery, at the distance of three feet row from row, and eighteen inches asunder in the rows, or into the places where they are to remain for good. The best season to transplant them (as I before observed) is in the beginning of *October*.

In order to have these trees aspire in height, their under branches should be taken off, especially where they are inclined to grow out strong; but they must not be kept too closely pruned, which would retard their growth; for all these ever-green trees do more or less abound with a resinous juice, which in hot weather is very apt to flow out from such places as are wounded; so that it will not be advisable to take off too many branches at once, which would make so many wounds, from which their sap in hot weather would flow in such plenty, as to render the trees weak and unhealthy.

The other sorts are also propagated by seeds, which must be procured from the countries where they grow naturally,

and sown as was directed for the other Junipers. When the plants come up they must be carefully weeded, and in dry weather should be refreshed with water, which will greatly forward their growth; the autumn following they should have a little rotten tan laid between them, to keep out the frost. In this bed the plants may remain till they have had two years growth, then they should be transplanted into other beds, and managed as was directed before for the other sorts.

In these beds they may remain two years, observing to keep them clear from weeds; and in winter lay a little fresh mulch upon the surface of the ground round their roots, which will prevent the frost from penetrating to them, and effectually preserve them; for while the plants are young, they are liable to be injured by very hard frosts; but when they have attained a greater strength, they will resist the severest of our cold.

After two years, they should either be removed into a nursery (as was directed for the common Juniper) or transplanted where they are designed to remain; observing always to take them up carefully, otherwise they are subject to fail upon transplanting; as also to mulch the ground, and water them as was before directed, until they have taken root; after which they will require no farther care, than only to keep the ground clear about their roots, and to prune up their side branches to make them aspire in height.

The timber of these trees is of excellent use in *America*, for building of vessels, wainscoting houses, and for making many sorts of utensils, it abounding with a bitter resin, which prevents its being destroyed by vermin, but it is very brittle, and so not proper for stubborn uses; but however, by increasing the number of our timber trees, we shall find many advantages, besides the pleasure their variety affords; for we may hereby have trees of very different kinds, which are adapted to grow in various soils and situations, whereby we shall never want proper trees for all the different soils in *England*, if proper care be taken in their choice; which would be a great improvement to many parts of this kingdom, which now lie unplanted, because the owner, perhaps, finds that neither Oaks or Elms will thrive there, so concludes, that no other sort will, which is a great mistake.

The *Bermudas* Cedar being a native of that island, and also of the *Bahama Islands*, is much tenderer than either of the former sorts, so is not likely to thrive well in this country; for although many of these plants have lived several years in the open air in *England*, yet whenever a severe winter happens, it either kills them, or so much defaces them, as that they do not recover their verdure in a year or two after.

The timber of this tree is of a brown colour, and very sweet; it is commonly known in *England* by the name of Cedar wood, though there are divers sorts of wood called by that name, which come from very different trees, especially in the *West-Indies*, where there are several trees of vastly different appearance and genera, which have that appellation; it is this wood which is used for pencils, as also to wainscot rooms, and make stair cases. In *America* they build ships with this wood, for they say, the worms do not eat the bottoms of the vessels built with this wood, as they do those built with Oak; so that the vessels built with Cedar are much preferable, especially for the use of the *West-India* seas, but they are not fit for ships of war, the wood being so brittle as to split to pieces with a cannon ball.

The *Jamaica* Juniper is more impatient of cold than the *Bermudas*, so will not live through the winter in the open air in *England*, so the plants must be preserved in pots, and housed in the winter; this is propagated by seeds, in the same way as the *Bermudas* Cedar, but if the pots are plunged into a moderate hot-bed the second spring after the

the seeds are sown, it will bring up the plants sooner, and they will have more time to get strength before winter.

The common Savin should not be neglected, because it is so very hardy as never to be injured by the severest frost; and as this spreads its branches near the ground, so if the plants are placed on the borders of woods, they will have a good effect in winter, by screening the nakedness of the ground from sight.

Most of these plants may be propagated by cuttings, if they are planted in the autumn, and the tender sorts screened in winter with a common frame; but the plants so raised, will not be so good as those which come from seeds.

JUSSIÆA. *Lin. Gen. Plant.* 478.

The Characters are,

It hath a small permanent empalement, divided into five parts, sitting upon the germen. The flower has five roundish petals, and ten short slender stamina. The oblong germen afterward becomes a thick oblong capsule, crowned by the empalement, which opens lengthways, and is filled with small seeds.

The Species are,

1. JUSSIÆA *erecta villosa, floribus tetrapetalis, octandriis, pedunculatis. Lin. Sp. Plant.* 388. Upright hairy Jussiaea, with flowers standing upon foot-stalks, having four petals and eight stamina.

2. JUSSIÆA *villosa, caule erecto ramoso, floribus, pentapetalis, decandriis sessilibus.* Hairy Jussiaea with an erect branching stalk, flowers having five petals, and ten stamina, which sit close to the stalk.

3. JUSSIÆA *erecta glabra, floribus tetrapetalis octandriis sessilibus. Flor. Zeyl.* 170. Smooth upright Jussiaea, with four petals, and eight stamina to the flowers, which sit close to the stalk.

4. JUSSIÆA *caule erecta ramoso glabro, floribus tetrapetalis octandriis sessilibus, foliis lanceolatis.* Jussiaea with an upright, branching, smooth stalk, flowers having four petals, and eight stamina sitting close to the stalk, and spear-shaped leaves.

5. JUSSIÆA *caule erecto simplici hirsuto, foliis lanceolatis, floribus pentapetalis aecandriis sessilibus.* Jussiaea with a single, upright, hairy stalk, spear-shaped leaves, flowers which have five petals, and ten stamina sitting close to the stalk.

The first sort grows naturally at *Campeachy*. This rises with a shrubby stalk three feet high, sending out several side branches, garnished with oblong hairy leaves, placed alternate. The flowers come out from the side of the stalks singly, upon short foot-stalks, having four small yellow petals, with eight stamina, sitting upon the germen, which afterward becomes an oblong seed-vessel, crowned by the four-leaved empalement, including many small seeds.

The second sort grows naturally in *Jamaica*. This rises with a hairy branching stalk two feet high, garnished with narrow spear-shaped leaves, placed alternate. The flowers come out toward the end of the branches singly from the wings of the leaves, sitting close to the stalk; they are composed of five pretty large yellow petals, and ten stamina, which sit upon a long germen, which afterward becomes the seed-vessel, crowned by the empalement, filled with small seeds.

The third sort grows naturally in *Jamaica*. This rises with a smooth erect stalk three feet high, garnished with long, narrow, smooth, spear-shaped leaves. The flowers are large and yellow, sitting close to the stalk, and are succeeded by long seed-vessels, shaped like those of the other sorts.

The fourth sort grows near *Carthage*. This hath a branching smooth stalk three feet high, garnished with spear-shaped leaves, standing upon short foot-stalks. The flowers are small, yellow, and are composed of four petals, and eight stamina; these sit very close to the stalk, and are succeeded by seed-vessels, shaped like those of the former sorts.

The fifth sort was sent me from *La Vera Cruz*. This rises with single, upright, red, hairy, channelled stalks three feet high. The leaves are spear-shaped, and placed alternate, standing nearer together than in any of the other sorts. The flowers come out from the wings of the leaves on the upper part of the stalk; they are composed of five large yellow petals, and ten stamina, sitting close to the stalks, and are succeeded by seed-vessels, which are one inch long, and shaped like those of the former sorts.

The first, second, and fourth sorts are annual plants, at least they are so in *England*; for if the plants are raised early in the spring, they will flower in *July*, and ripen their seed the beginning of *October*, and the plants soon after decay.

The third and fifth sorts will continue through the winter in the bark-stove; but these must be such plants as do not flower and seed the first year, for after they have perfected seeds, the following summer the plants decay.

All these sorts are propagated by seeds, which should be sown early in the spring, on a moderate hot-bed. When the plants come up, and are fit to remove, they should be each planted into a small separate pot, and plunged into a hot-bed of tanners bark, where they should be shaded from the sun till they have taken new root, after which they should have free air admitted to them every day, in proportion to the warmth of the season. When the roots of the plants have filled these small pots, the plants should be removed into others, a size larger; and if the plants are too tall to stand under the frames of the hot-bed, they should be removed into the bark-stove, where they may remain to flower and perfect their seeds; for when the plants rise early in the spring, and are brought forward in hot-beds, all the sorts will flower and perfect their seeds the same year.

JUSTICIA. *Houft. Nov. Gen. Lin. Gen. Plant.* 26.

The Characters are,

The flower hath one petal, which is divided into two lips, almost to the bottom, which are entire. The upper lip is raised archways, and the under is reflexed. It hath two awl-shaped stamina, situated under the upper lip, with an oblong germen, which afterward becomes an oblong capsule with two cells, which open with an elasticity, and cast out the roundish seeds.

The Species are,

1. JUSTICIA *foliis oblongo-ovatis hirsutis, sessilibus, floribus spicatis alaribus, caule fruticoso.* Justicia with oblong, oval, hairy leaves, sitting close to the stalks, and flowers growing in spikes proceeding from the side of the stalks, which are shrubby.

2. JUSTICIA *caule erecto ramoso hexangulati, foliis ovatis oppositis, bracteis cuneiformibus confertis.* Justicia with an erect branching stalk, having six angles, oval leaves placed opposite, and wedge-shaped small leaves (or bractæ) growing in clusters.

3. JUSTICIA *foliis ovato-lanceolatis, pediculatis, hirsutis, bracteis cordatis acuminatis, caule fruticoso.* Justicia with oval spear-shaped leaves growing on foot-stalks, heart-shaped acute-pointed bractæ, and a shrubby stalk.

4. JUSTICIA *arborea, foliis lanceolato-ovatis, bracteis ovatis persistentibus, corollarum galeâ concavâ. Flor. Zeyl.* 16. Tree Justicia with oval spear-shaped leaves, oval permanent bractæ, and a concave helmet to the flower; commonly called *Malabar Nut*.

5. JUSTICIA *fruticosa, foliis lanceolatis integerrimis, pedunculis trifloris ancipitibus, bracteis calyce brevioribus. Lin. Sp. Plant.* 15. Shrubby Justicia with entire spear-shaped leaves, foot-stalks having three flowers looking different ways, and a bractæ shorter than the empalement; commonly called *Snap Tree*.

6. JUSTICIA *spinosa, foliis oblongo ovatis emarginatis, caule fruticoso ramoso.* Prickly Justicia with oblong oval leaves, indented at their edges, and a shrubby branching stalk.

7. JUSTICIA

7. *JUSTICIA arborea, foliis lanceolato-ovatis sessilibus, subtus tomentosis, floribus spicatis congestis terminalibus.* Tree *Justicia* with spear-shaped oval leaves, woolly on their under side, sitting close to the stalks, and spikes of flowers growing in clusters at the ends of the branches.

8. *JUSTICIA arborea, foliis lanceolato-ovatis, bracteis ovatis deciduis mucronatis, corollarum galeâ reflexâ.* Flor. Zeyl. 17. Tree *Justicia* with spear-shaped oval leaves, oval-pointed bractæ, which fall off, and a reflexed helmet to the flowers.

The first sort grows naturally at *La Vera Cruz*. This rises with a shrubby brittle stalk five or six feet high, sending out many branches, garnished with oblong, oval, hairy leaves, placed opposite; from the wings of the leaves come out the spikes of flowers, which are reflexed like a scorpion's tail. The flowers are large, of a carmine colour, ranged on one side of the spikes; these are succeeded by short pods about half an inch long.

The second sort is a native of the same country. This is an annual plant, with an upright stalk with six angles, which rises from two to three feet high, dividing into many branches, garnished with oval leaves placed opposite. At each joint come out clusters of small wedge shaped leaves, which are termed bractæ. The flowers are produced in small spikes at the end of the branches, sitting very close among the leaves; they are of a beautiful carmine colour, of one petal, which has two lips. The upper lip is arched, bending over the lower, which is also a little reflexed, but both are entire. The flowers are succeeded by short wedge-shaped capsules, opening lengthways, inclosing two small oval seeds.

The third sort grows naturally at *Campeachy*. This rises with a hairy shrubby stalk four or five feet high, dividing into several branches, garnished with oval, spear-shaped, hairy leaves, standing upon foot-stalks, placed opposite. The flowers come out in loose clusters from the wings of the stalks, toward the end of the branches; they are of a pale red colour, shaped like those of the former sort.

These plants are propagated by seeds, which should be sown early in the spring in small pots, and plunged into a moderate hot-bed of tanners bark. The seeds of these plants frequently lie a year in the ground, so that the pots must not be disturbed, if the plants do not come up the same year; but in the winter should be kept in the stove, and the spring following plunged into a fresh hot-bed, which will bring up the plants if the seeds were good.

When the plants are about two inches high, they should be carefully taken up, and each transplanted into a separate small pot, and plunged into the hot-bed again, being careful to water and shade them until they have taken new root; after which time they should have air admitted to them every day, in proportion to the warmth of the season, and duly watered in hot weather.

As the plants advance in their growth, they should be shifted into larger pots; and as they are too tender to endure the open air in this country, so they should always remain in the hot-bed, being careful to let them have a due proportion of air in hot weather; and the annual sort should be brought forward as fast as possible in the spring, that the plants may flower early, otherwise they will not produce good seeds in *England*.

The first and third sorts should remain in the hot-bed during the summer season (provided there be room under the glasses, without being scorched;) but at *Michaelmas* they should be removed into the stove, and plunged into the bark-bed, where they must remain during the winter season. The following summer these plants will flower, and abide several years, but they rarely produce good seeds in *Europe*.

The fourth sort grows naturally in the island of *Ceylon*, but has been long in the *English* gardens, where it is commonly known by the title of *Malabar Nut*. This, though a native of so warm a country, is hardy enough to live in a good green house in *England*, without any artificial heat. It rises here with a strong woody stalk, to the height of twelve or fourteen feet, sending out many spreading branches, garnished with spear-shaped oval leaves six inches long and three inches broad, placed opposite. The flowers are produced on short spikes at the end of the branches, which are white, with some dark spots, but are not succeeded by any seeds in *England*.

This sort may be propagated by cuttings, which, if planted in pots in *June* or *July*, and plunged into a very moderate hot-bed, will take root, but they must be screened from the sun; and if the external air is excluded from them, they will succeed better than when it is admitted to them. It may also be propagated by laying down the young branches, which will take root in one year, and then should be put each into a separate pot, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation during the summer, and in the autumn they must be housed, and treated in the same way as *Orange trees*, with only this difference, that these require more water.

The fifth sort grows naturally in *India*. This rises with a shrubby stalk from three to four feet high, sending out branches on every side from the bottom, so as to form a kind of pyramid, garnished with spear-shaped entire leaves, near two inches long, and one third of an inch broad; they are smooth, stiff, and of a deep green, standing opposite. At the base of the foot-stalks come out clusters of smaller leaves, of the same shape and texture. The flowers come out upon short foot-stalks from the side of the branches, each foot-stalk supporting one, two, or three white flowers, with long empalements, which are succeeded by oblong seed-vessels, which when ripe cast out their seeds with an elasticity, from whence it had the title of *Snap tree*.

This is propagated by cuttings during any of the summer months, which should be planted in pots, and plunged into a hot bed which has lost its great heat, and shaded from the sun. In about two months the cuttings will have taken root, then they must be gradually inured to bear the open air, into which they should be removed, placing them in a sheltered situation, where they may stay till autumn; but if they get root pretty early in the summer, it will be proper to separate them each into a single small pot, setting them in the shade till they have taken new root, after which they may be placed as before directed; but when it is late in the season before they take root, it will be better to let them remain in the same pots till the following spring. In winter these plants must be placed in a warm green-house, or in a moderate warm stove, for they are impatient of cold and damp, nor will they thrive in too much warmth; they will often require water in winter, but during that season it must be given them moderately; in summer they must be removed into the open air, but should have a warm sheltered situation, and in warm weather they must have plenty of water. This plant flowers at different seasons, but never produces fruit here.

The sixth sort grows naturally in *Jamaica*. This rises with many shrubby slender stalks, about five feet high, sending out branches on every side, which are covered with a whitish bark, garnished with small, oblong, oval leaves, coming out two on each side the stalk opposite, and under the leaves are placed at every joint two sharp thorns like those of the *Berberry*; the flowers come out singly from the wings of the leaves; they are small, and of a pale red colour, and shaped like those of the other sorts.

The seventh sort grows naturally at *Campeachy*. This rises with a strong woody stem twenty feet high, dividing into many crooked irregular branches, covered with a light brown bark, garnished with spear-shaped oval leaves, near four inches long and two broad, which are covered with a soft down on their under side. The flowers grow in spikes from the end of the branches, three, four, or five of these spikes arising from the same point, the middle spike being near three inches long, and the others about half that length. The flowers are small, white, and shaped like those of the other species.

The eighth sort grows naturally at *Malabar* and in *Ceylon*. This rises with a strong woody stem ten or twelve feet high, dividing into many branches, garnished with spear-shaped oval leaves five inches long, and two and a half broad, of a lucid green, placed opposite. The flowers grow in very long spikes from the end of the branches; they are of a greenish colour, with a shade of blue; the helmet of the flower is reflexed.

These three sorts are propagated by seeds, in the same manner as the three first, and the plants must be treated in the same way, especially while they are young; but afterward the eighth sort may be more hardily treated. This sort may also be propagated by cuttings, in the same manner as the fifth sort; and when the plants are two or three years old, they will thrive in a moderate degree of warmth in winter, and in the summer they may be placed abroad for two months in the warmest season of the year, but they should have a warm sheltered situation, and when the nights begin to grow cold, they must be removed into the stove, but they must have free air admitted to them at all times when the weather is warm. The other two sorts should constantly remain in the bark-stove, and require the same treatment as other tender plants from the warmest countries.

IXIA. *Lin. Gen. Plant.* 54.

The Characters are,

It hath oblong permanent spathæ (or sheaths) which inclose the germen; the flower has six petals which are equal, and three awl-shaped stamina. It hath an oval three-cornered germen, situated below the flower, with a single style; the germen afterward becomes an oval capsule with three cells, filled with roundish seeds.

The Species are,

1. IXIA *foliis ensiformibus, floribus remotis. Hort. Upsal.* 16. Ixia with sword-shaped leaves, and flowers standing distant.
2. IXIA *floribus capitatis, spathis laceris. Lin. Sp. Plant.* 36. Ixia with flowers growing in heads, and ragged sheaths.
3. IXIA *foliis gladiolatis, nervosis, hirsutis, floribus, spicatis terminalibus. Icon. tab.* 155. *fig.* 1. Ixia with sword-shaped, hairy, veined leaves, and flowers growing in spikes at the ends of the stalks.
4. IXIA *foliis lineari-gladiolatis, floribus alaribus & terminalibus. Icon. tab.* 155. *fig.* 2. Ixia with narrow sword-shaped leaves, and flowers proceeding from the sides and tops of the stalk.
5. IXIA *foliis gladiolatis glabris, floribus corymbosus terminalibus. Icon. tab.* 156. Ixia with smooth spear-shaped leaves, and flowers growing in a corymbus terminating the stalk.
6. IXIA *foliis lineari-ensiformibus axillis bulbiferis, floribus alternis staminibus lateralibus. Lin. Syst.* Ixia with narrow sword-shaped leaves, flowers placed alternate, and stalks bearing bulbs at the joints.
7. IXIA *foliis gladiolatis, floribus distantibus.* Ixia with sword shaped leaves, and flowers growing distant.
8. IXIA *foliis lineari gladiolatis, floribus spicatis sessilibus terminalibus.* Ixia with narrow sword-shaped leaves, and sessile flowers growing in spikes at the top of the stalk.
9. IXIA *foliis gladiolatis glabris, floribus remotis alternim sitis, petalis patentibus acuminatis.* Ixia with smooth sword-shaped

leaves, flowers placed distant alternately, and pointed petals which spread open.

The first sort grows naturally in *India*, and also at the *Cape of Good Hope*; the stalks rise to the height of three or four feet. It hath a pretty thick fleshy root, divided in knots or joints of a yellowish colour, sending out many fibres; the stalk is pretty thick, smooth, and jointed, garnished with sword-shaped leaves a foot long and one inch broad, with several longitudinal furrows, embracing the stalks with their base, ending in acute points; the upper part of the stalk divaricates into two smaller, with a foot-stalk arising between them, which supports one flower; the smaller branches divaricate again in the same manner into foot-stalks, which are two inches long, each sustaining one flower. At each of these joints is a permanent spatha or sheath embracing the stalk, ending in an acute point; the flowers are composed of six equal petals, of a yellow colour within, variegated with dark red spots; the outside is of an Orange colour. These appear in *July* and *August*, and in warm seasons are succeeded by seeds.

This sort may be propagated either by seeds or parting of the roots: if by seeds, they should be sown in pots soon after they are ripe, and plunged into an old hot-bed, under a frame to screen them from frost; and in the spring the plants will come up, when they should be inured to the open air by degrees, for in summer they must be wholly exposed thereto. The following autumn they must be separated; some of the plants may be planted in a warm border, where they will abide through the common winters very well, but in severe frosts they are often killed, unless they are covered with tan, or other covering to keep out the frost, therefore a few of the plants may be kept in pots, and sheltered under a frame in winter.

The stalks and leaves of this plant decay to the root in autumn, so that if the surface of the ground about the roots is covered two or three inches thick with tan, it will secure them from the danger of frost; and in the spring before the roots shoot, will be the best time to remove and part the roots; but this should not be done oftener than every third year, for when they are often parted, they will be weak, and will not flower so well.

The second sort grows naturally at the *Cape of Good Hope*. This is a low plant, which rises three or four inches high; the leaves are narrow and veined, the flowers are small, growing in a downy head on the top of the stalk, but they make little appearance, so are only kept for the sake of variety.

The third sort I raised from seeds, which were sent me from the *Cape of Good Hope*. This hath a bulbous root a little compressed, covered with a red skin, from which arise five or six sword-shaped leaves about three or four inches long, hairy, with several longitudinal furrows; these embrace each other at their base; between these come out the flower-stalk, which rises six or eight inches high, naked to the top, and terminated by a cluster of flowers, each having a spatha or hood, which dries and is permanent; the flowers are of a deep blue colour, and are succeeded by roundish, three-cornered, seed-vessels with three cells, filled with roundish seeds.

The fourth sort was raised from seeds in the *Chelsea* garden, which came with those of the former. This hath a small, round, bulbous root, from which arise four or five narrow, long, sword shaped leaves six or seven inches long; between these come out a very slender round stalk about ten inches long; from the side of which there comes out one or two clusters of flowers, standing upon short foot-stalks, and at the top of the stalk the flowers grow in a loose spike; they are of a pure white, and shaped like those of the other species.

The seeds of the fifth sort were sent me from the *Cape of Good Hope*. This has an oval bulbous root, which is a little compressed, from which come up three or four narrow, thin, sword-shaped leaves near a foot long; the flower-stalk rises a little above the leaves; it is very slender, naked, and terminated by a round cluster of flowers, composed of six pretty large, oblong, concave petals, of a deep yellow colour, each having a large black spot at the base. This flowers early in *May*, and the seeds ripen the latter end of *June*.

The sixth sort hath narrow sword-shaped leaves about six or seven inches long. The stalk rises near a foot and a half high, garnished with one leaf at each of the lower joints, of the same shape with the other but smaller; these embrace the stalk with their base, and stand erect; the upper part of the stalk is adorned with flowers composed of six oblong, oval, whitish petals, having a blue stripe on their outside, which are placed alternate on the stalk, which is bent at each joint where the flowers stand; the flowers have three short stamina, which are joined at their base, terminated by long, flat, erect summits; the germen is situated under the flower, supporting a long slender style, crowned by a trifid stigma; the germen afterward becomes a roundish capsule with three cells, filled with roundish small seeds. The stalks at each of the lower joints thrust out small bulbs, which, if planted, will grow and produce flowers.

The seventh sort hath shorter and broader leaves than the former. The stalk is slender and furrowed; at each of the lower joints is garnished with one leaf of the same shape, embracing the stalk with their base; the flowers come out toward the top of the stalk at two or three inches distance, each stalk supporting two or three sulphur-coloured flowers, which are each composed of six spear-shaped petals an inch and a half long, equal in their size and regular in position; they have a short permanent empalement, cut into two long and two shorter acute segments; these are succeeded by round capsules with three cells, filled with round seeds.

The eighth sort hath very small, round, bulbous roots, from which arise three or four long, slender, smooth, Grass-like leaves, of a dark green colour; between these come

out the stalk, which is very slender, rising a foot and a half high; at the top the flowers are collected in a spike sitting close to the stalk, each having a thin, dry, permanent spatha or sheath, which covers the capsule after the flower is fallen. The flowers are of a pure white, and shaped like those of the other species, but are smaller; they are succeeded by small, round, seed-vessels with three cells, each containing two or three round seeds.

The ninth sort hath a roundish, compressed, bulbous root, from which arise broad sword-shaped leaves a foot and a half long, of a deep Grass-green colour: the foot-stalk of the flower rises two feet high; the flowers are placed alternately at distances on the upper part of the stalk, each having an acute-pointed spatha or sheath, which is permanent, afterward covering the capsule. The flowers are much larger than those of the former sorts, of a bright red colour, having six equal petals, which spread open wide, and three awl-shaped stamina arising from the intervals of the petals standing erect, between which arises a single style of the same length as the stamina. After the flower is past, the germen, which is situated under the flower, becomes an oval capsule with three cells, including several round seeds. The roots of most, if not all these sorts, are frequently eaten by the inhabitants at the *Cape of Good Hope*, who greatly esteem them.

All the sorts multiply very fast by offsets, so that when once obtained, there will be no occasion to raise them from seeds; for the roots put out offsets in great plenty, most of which will flower the following season, whereas those from seeds are three or four years before they flower. These plants will not live through the winter in the full ground in *England*, so should be planted in pots, and placed under a frame in winter, where they may be protected from frost, but in mild weather should enjoy the free air; but they must be guarded from mice, who are very fond of these roots, and, if not prevented, will devour them. If a frame is made for these in the same manner as is directed for the *African Gladioluses*, and other bulbous roots which require no artificial heat, they will thrive and flower much better than when they are planted in pots.

K.

K A L

KALI. See Salsola.
KALMIA. *Lin. Gen. Plant.* 482.

The Characters are,

The flower has a small permanent empalement, and one petal cut into five segments, which spread open. It hath ten stamina which are the length of the petal, and decline in the middle. In the center is situated a roundish germen, which afterward becomes an oval or globular capsule with five cells, filled with very small seeds.

The Species are,

1. KALMIA foliis ovatis, corymbus terminalibus. Kalmia with oval leaves, and flowers growing in bunches terminating the branches.

K A L

2. KALMIA foliis lanceolatis corymbis lateralibus. *Lin. Gen. Nov.* 1079. Kalmia with spear-shaped leaves, and flowers growing in round bunches on the sides of the stalk.

The first sort grows in several parts of *North America*, where it rises from six to twelve feet high, dividing into many ligneous branches, covered with a dark gray bark; they are generally crooked and irregular, but are closely garnished with stiff leaves about three inches long and one broad, of a lucid green, standing upon slender foot-stalks; the flowers grow in loose bunches at the end of the branches, upon long foot-stalks; they are of one petal, with a short tube, which spreads open at the top, where it is cut into five

five angles; the flowers are of a bright red colour when they first open, but afterward fade to a blush or Peach-bloom colour; these are succeeded by roundish, compressed, seed-vessels crowned by the permanent style, divided into five cells, which are filled with small roundish seeds.

The leaves of this elegant plant are supposed to have a noxious quality, destroying sheep and oxen when they feed upon them, yet the deer eat them with impunity.

The second sort grows naturally in *Pensylvania*, where it rises four or five feet high, but in *England* I have not seen any, which were more than half that height.

The leaves of this sort are about two inches long, and half an inch broad in the middle; they are stiff, of a lucid green, and stand opposite; sometimes they are by pairs at each joint, and at others there are four, two on each side, standing upon very short foot-stalks; the flowers come out in clusters on every side the stalks; they are of a beautiful red colour, and shaped like those of the first sort, but smaller; they are succeeded by short, roundish, compressed capsules with five cells, crowned by the permanent style, and filled with very small seeds. This shrub, in its native country, continues flowering most part of summer.

Both these sorts multiply by their creeping roots in their native soil, and where they have stood unremoved a considerable time, they put out suckers in pretty great plenty; and as these plants, which come from suckers, are much more likely to produce others than those which are raised from seeds, and will flower much sooner, so the plants should not be removed, but encouraged to spread their roots, whereby they may be propagated; they love a moist, light, boggy soil, in which they will thrive and flower.

KARATAS, the Penguin or wild Ananas.

The Characters are,

It hath a tubulous bell-shaped flower, divided into three parts at the mouth, from whose calyx arises the pointal, fixed like a nail in the hinder part of the flower, which afterward becomes a fleshy almost conical fruit, divided by membranes into three cells, which are full of oblong seeds.

There is but one sort of this plant at present known, which is,

KARATAS *foliis altissimis, angustissimis & aculeatis. Plum. Nov. Gen.* The wild Ananas or Penguin.

Father *Plumier* has made a great mistake in the figure and description of the characters of this plant, and the *Caraguata*; for he has joined the flower of the *Caraguata* to the fruit of the *Karatas*, and *vice versa*; and this has led many persons into mistakes, who have joined the *Bromelia* and *Ananas* to this, making them of the same genus.

This plant is very common in the *West-Indies*, where the juice of its fruit is often put into punch, being of a sharp acid flavour. There is also a wine made of the juice of this fruit, which is very strong, but it will not keep good long, so is only for present use. This wine is very intoxicating, and heats the blood, therefore should be drank very sparingly.

In *England* this plant is preserved as a curiosity, for the fruit seldom arrives to any degree of perfection for use in this country, though it often produces fruit in *England*, which has ripened pretty well; but if it were to ripen as thoroughly here as in its native country, it will be little valued on account of its great austerity, which will often take the skin off from the mouths and throats of those people, who eat it incautiously.

This plant is propagated by seeds, for though there are often suckers sent forth from the old plants, yet they come out from between the leaves, and are so long, slender, and ill-shapen, that if they are planted they seldom make regular plants. These seeds should be sown early in the spring in small pots, and plunged into a hot-bed of tanners bark, where the plants will come up in six weeks. When the

plants are strong enough to transplant, they should be carefully taken up, each planted into a separate pot, and plunged into the hot-bed again; when the plants have taken new root, they should have air and water in proportion to the warmth of the season. In this bed the plants may remain till *Michaelmas*, then they should be removed into the stove, and plunged into the bark-bed, where they should be treated in the same manner as the *Ananas*.

The leaves of this plant are strongly armed with crooked spines, which renders it very troublesome to shift or handle them; for the spines catch hold of whatever approaches them by their crooked form, being some bent one way, and others the reverse, so that they catch both ways, and tear the skin or clothes of the persons who handle them, where there is not the greatest care taken to avoid them.

The fruit of this plant is produced in clusters, growing upon a stalk about three feet high, with a tuft of leaves growing on the top, so at first sight has the appearance of a Pine Apple; but, when closer viewed, they will be found to be a cluster of oblong fruit, each being about the size of a finger.

KETMIA. See *Hibiscus*.

KIGGELARIA. *Lin. Gen. Plant.* 1001.

The Characters are,

The male and female flowers are situated on different trees; the male flowers have five concave petals, which are shaped like a pitcher; each having a honey gland fastened to their base, and have ten small stamina. The female flowers have petals like the male, but no stamina. In the center is situated a roundish germen, which afterward becomes a rough globular fruit with a thick cover, having one cell, filled with angular seeds.

We have but one Species of this genus, viz.

KIGGELARIA. *Hort. Cliff.* 462. fol. 29.

This plant grows naturally at the *Cape of Good Hope*, where it rises to be a tree of middling stature; but as it will not live in the open air here, they cannot be expected to grow to a great magnitude in *England*. There are plants of it in the *Chelsea* garden upward of ten feet high, with strong woody stems and pretty large heads; the branches have a smooth bark, which is first green, but afterward changes to a purplish colour; the leaves are about three inches long and one broad, of a light green colour, sawed on their edges, and stand upon short foot-stalks alternately. The flowers come out in clusters from the side of the branches, hanging downward; they are of an herbaceous white colour. The male flowers fall away soon after their farina is shed, but the female flowers are succeeded by globular fruit about the size of common red Cherries, with a rough cover, of a thick consistence, opening in four parts at the top, to each of which adhere many small angular seeds. These fruits have grown to their full size in the *Chelsea* garden, but the seeds never came to maturity.

These plants are not very common in *Europe*, being very difficult to propagate; for when any of the young branches are laid down, very few of them take root, and those which do are two years before they put out roots; nor do the cuttings succeed much better, for very few of them will take root, when planted with the utmost care: the best time to plant the cuttings is in *May*, just before the plants begin to shoot; these should be planted in pots, and plunged into a very moderate hot-bed, covering them close with a glass, to exclude the air from them, and shade them every day from the sun; they should have very little water after their first planting. Those which do grow should be planted into separate small pots, and shaded till they have taken fresh root, then may be exposed to the air in a sheltered situation till autumn, when they must be removed into the greenhouse, and treated in the same manner as *Orange* trees, and other greenhouse plants.

KITCHEN-GARDEN. A good kitchen-garden is almost as necessary to a country seat, as a kitchen to the house; for without one, there is no way of being supplied with a great part of necessary food, the markets in the country being but poorly furnished with esculent herbs, and those only upon the market days, which are seldom oftener than once a week; so that unless a person has a garden of his own, there will be no such thing as procuring them fresh, in which their goodness consists; nor can any variety of these be had in the country markets, therefore whoever proposes to reside in the country should be careful to make choice of a proper spot of ground for this purpose; and the sooner that is made and planted, the produce of it will be earlier in perfection; for fruit trees and Asparagus require three years to grow, before any produce can be expected from them; so that the later the garden is made, the longer it will be before a supply of these things can be had for the table. And although the usefulness of this garden is acknowledged by almost every one, yet there are few who are careful to make a proper choice of soil and situation for such a garden: the modern taste, which is perhaps carried to as extravagant lengths, in laying open and throwing every obstruction down, as the former custom of inclosing within walls was ridiculous; so that now one frequently sees the kitchen-garden removed to a very great distance from the house and offices, which is attended with great inconveniencies; and often situated on a very bad soil, sometimes too moist, and at others without water, so that there is a great expence in building walls and making the garden, where there can be little hopes of success.

Nor will a kitchen garden be well attended to, when it is so situated as to be out of sight of the possessor, especially if the gardener has not a love and value for it, or if it lies at a great distance from the mansion-house, or the other parts of the garden, a great part of the labourer's time will be lost in going from one part to the other: therefore, before the general plan of the pleasure-garden is settled, a proper piece of ground should be chosen for this purpose, and the plan so adapted, as that the kitchen-garden may not become offensive to the sight, which may be effected by proper plantations of shrubs to screen the walls; and through these shrubs may be contrived some winding walks, which will have as good an effect as those which are now commonly made in gardens for pleasure only. In the choice of the situation, if it does not shut out any material prospect, there can be no objection to the placing it at a reasonable distance from the house or offices; for as particular things may be wanted for the kitchen, which were not thought of at the time when directions were given to the gardener what to bring in, so if the garden is situated at a great distance from the house, it will be found very inconvenient to send thither as often as things are wanting: therefore it should be contrived as near the stables as possible, for the conveniency of carrying the dung thither; which, if at a great distance, will add to the expence of the garden.

As to the figure of the ground, that is of no great moment, since in the distribution of the quarters all irregularities may be hid; though if you are at full liberty, an exact square or an oblong is preferable to any other figure.

The great thing to be considered is, to make choice of a good soil, not too wet nor over dry, but of a middling quality; nor should it be too strong or stubborn, but of a pliable nature, and easy to work; and if the place where you intend to make the kitchen-garden should not be level, but high in one part and low in another, I would by no means advise the levelling it; for by this situation you will have an advantage which could not be obtained on a per-

fect level, which is, the having one part of dry ground for early crops, and the low part for late crops, whereby the kitchen may be the better supplied throughout the season with the various sorts of herbs, roots, &c. And in very dry seasons, when in the upper part of the garden the crops will greatly suffer with drought, then the lower part will succeed, and so *vice versâ*; but I would by no means direct the choosing a very low moist spot of ground for this purpose; for although in such soils garden herbs are commonly more vigorous and large in the summer season, yet they are seldom so well tasted or wholesome as those which grow upon a moderate soil; and especially since in this garden your choice fruits should be planted, it would be wrong to make choice of a very wet soil for this purpose.

This garden should be fully exposed to the sun, and by no means overshadowed with trees, buildings, &c. which are very injurious to fruit trees; but if it be defended from the north wind by a distant plantation, it will greatly preserve the early crops in the spring. But these plantations should not be too near nor very large, for I have generally found where kitchen-gardens are placed near woods or large plantations, they have been much more troubled with blights in the spring than those which have been more exposed.

The quantity of ground necessary for a kitchen-garden, must be proportioned to the largeness of the family, or the quantity of herbs desired: for a small family, one acre and a half of ground may be sufficient; but for a large family there should not be less than four or five acres; because, when the ground is regularly laid out, and planted with espaliers of fruit trees, this quantity will be found little enough, notwithstanding what some persons have said on this head.

This ground must be walled round, and if it can be conveniently contrived, so as to plant both sides of the wall which have good aspects, it will be a great addition to the quantity of wall fruit: and those slips of ground which are without side of the walls, will be very useful for planting of Gooseberries, Currants, Strawberries, and some sorts of kitchen plants, so that they may be rendered equally useful with any of the quarters within the walls; but these slips should not be too narrow, lest the hedge, pale, or plantation of shrubs which inclose them, should shade the borders where the fruit trees stand: the least width of these slips should be twenty-five or thirty feet, but if they are double that it will be yet better, the slips will be more useful, and the fruit trees will have a larger scope of good ground for their roots to run. The walls should be built about ten or twelve feet high, which will be sufficient height for most sorts of fruit.

The soil of this garden should be at least two feet deep; but if deeper it will be still better, otherwise there will not be depth enough for many sorts of esculent roots, as Carrots, Parsneps, Beets, &c. which run down pretty deep in the ground, and most other sorts of esculent plants delight in a deep soil; and many plants, whose roots appear short, yet if their fibres, by which they receive their nourishment, are traced, they will be found to extend to a considerable depth in the ground; so that when these are stopped by meeting with gravel, chalk, clay, &c. the plants will soon shew it, by their colour and stunted growth.

In the distribution of this garden, next the south and other good aspected walls, the borders should be at least eight or ten feet broad, whereby the roots of the fruit trees will have greater liberty than in such places where the borders are not above three or four feet wide; and upon these borders you may sow many sorts of early crops, if exposed to the south; and upon those exposed to the north, you may have some late crops; but I would by no means advise the planting any sort of deep rooting plants too near the fruit trees,

trees, especially Pease and Beans; though for the advantage of the walls, to preserve them in winter, and to bring them forward in the spring, the gardeners in general are too apt to make use of those borders, which are near the best aspect walls, to the great prejudice of their fruit trees; but for these purposes it is much better to have some Reed hedges fixed in some of the warmest quarters, close to which you should sow and plant early Pease, Beans, &c. where they will thrive as well as if planted near a wall, and hereby the fruit trees will be entirely freed from such troublesome plants.

The walks of this garden should be also proportioned to the size of the ground, which in a small garden should be six feet, but in a large one the middle walks should be ten or twelve; on each side of the walk should be allowed a border four or five feet wide between the espalier and the walk, whereby the distance between the two espaliers will be greater, and these borders being kept constantly worked and manured, will be of great advantage to the roots of the trees; in these borders may be sown some small Sallad, or any other herbs, which do not continue long or root deep, so that the ground will not be lost.

The breadth of these middle walks, which I have here assigned them, may by many persons be thought too great; but my reason for this is to allow proper room between the espaliers, that they may not shade each other, or their roots interfere and rob each other of their nourishment; but where the walks are not required of this breadth, it is only enlarging of the borders on each side, and so reducing the walks to the breadth desired.

The walks of these gardens should not be gravelled, for as there will be constantly an occasion to wheel manure, water, &c. upon them, they would soon be defaced, and rendered unsightly; nor should they be laid with turf, for in green walks, when they are wheeled upon or much trodden, the turf is soon destroyed, and those places where they are much used, become very unsightly also, therefore the best walks for a kitchen-garden are those which are laid with a binding sand; but where the soil is strong and apt to detain the wet, there should be some narrow underground drains made by the side of the walks, to carry off the wet, otherwise there will be no using of the walks in bad weather; and where the ground is wet, some lime rubbish, flints, chalk, or any such material as can be procured with the least expence, should be laid at the bottom of them; and if neither of these can be had, a bed of heath or furze should be laid, and the coat of sand laid over it, by which the sand will be kept drier, and the walks will be sound and good in all seasons. These sand walks are by much the easiest kept of any, for when either weeds or moss begin to grow, it is but scuffling them over with a Dutch hoe in dry weather, and raking them over a day or two after, and they will be as clean as when first laid; or if the walks are covered with the dust taken from the great roads, it will bind and make a firm walk.

The best figure for the quarters to be disposed, is a square or an oblong, where the ground is adapted to such a figure; otherwise they may be triangular, or of any other shape, which will best suit the ground.

When the garden is laid out in the shape intended, if the soil is strong, and subject to detain moisture, or is naturally wet, there should always be underground drains made, to carry off the wet from every quarter of the garden, for otherwise most sorts of kitchen plants will suffer greatly by moisture in winter; and if the roots of the fruit trees get into the wet, they will never produce good fruit, so that there cannot be too much care taken to let off all superfluous moisture from the kitchen-garden.

In one of these quarters, which is situated nearest to the

itables, and best defended from the cold winds, or if either of the slips without the garden wall, which is well exposed to the sun, lies convenient, and is of a proper width, that should be preferred for a place to make hot-beds for early Cucumbers, Melons, &c. The reasons for my giving the preference to one of these slips, is, first, there will be no dirt or litter carried over the walks of the kitchen-garden in winter and spring, when the weather is generally wet, so that the walks will not be rendered unsightly; secondly, the view of the hot-beds will be excluded from sight; and lastly, the convenience of carrying the dung into these slips, for by making of a gate in the hedge or pale, wide enough for a small cart to enter, it may be done with much less trouble than that of barrowing it through the garden; and where there can be a slip long enough to contain a sufficient number of beds for two or three years, it will be of great use, because by the shifting of the beds annually, they will succeed much better than when they are continued for a number of years on the same spot of ground; and as it will be absolutely necessary to fence this Melon ground round with a Reed hedge, it may be so contrived as to move away in pannels, and then that hedge, which was on the upper side the first year, being carried down to a proper distance below that which was the lower hedge, and which may remain, there will be no occasion to remove more than one of the cross hedges in a year; therefore I am persuaded, whoever will make trial of this method, will find it the most eligible.

The most important points of general culture consist in well digging, keeping clean, and manuring the soil, and giving proper distance to the trees and plants, according to their different growths (which is constantly exhibited in their several articles in this book). The dunghills should also be kept always clear from weeds, for it will be to little purpose to keep the garden clean, if this is not observed; for if the seeds of weeds are suffered to scatter upon the dung, they will be brought into the garden, whereby there will be a constant supply of weeds yearly introduced, to the no small damage of your plants, and a perpetual labour occasioned to extirpate them again. Another thing which is absolutely necessary to be observed, is, to carry off all the refuse leaves of Cabbages, the stalks of Beans, and haulm of Pease, as soon as they have done beating, for the ill scent which most people complain of in kitchen-gardens, is wholly occasioned by these things being suffered to rot upon the ground; therefore when the Cabbages are cut, all the leaves should be carried out of the garden while they are fresh, at which time they may be very useful for feeding of hogs, or other animals, and this will always keep the garden neat, and free from ill scents. As for all other necessary directions, they will be found in the articles of the several sorts of kitchen plants, which renders it needless to be repeated in this place.

KLEINIA. See Cacalia.

KNAUTIA. *Lin. Gen. Plant.* 109.

The Characters are,

It hath several floscular flowers inclosed in one common cylindrical empalement, which have their petals ranged so as to appear like a regular flower, but each separate floscule is irregular; in the bottom of each floret is situated the germen, attended by four stamina, which germen after-ward changes to a single, oblong, naked seed.

There is but one Species of this plant at present known, viz.

KNAUTIA. *Lin. Hort. Cliff.* This plant is very near akin to the Scabious, under which genus it has been ranged by several botanists, but the appearance of the flower at first sight being like a Lychnis, Dr. Boerhaave separated it from the Scabious, and gave it the title of *Lychni Scabiosa*, which being

being a compound name, Dr. *Linnaeus* has altered to this of *Knautia*.

This is an annual plant; the seeds of it were brought from the *Archipelago*, where it is a native; but when it is allowed to scatter its seeds in a garden, it will propagate itself in as great plenty as if it were a native of *England*; and these autumnal plants, which arise from the scattered seeds, will grow much stronger than those which are sown in the spring. All the culture this plant requires is, to keep it clear from weeds, for it will thrive on almost any soil, or in any situation.

KOEMPFERIA. *Lin. Gen. Plant.* 7.

The Characters are,

It hath a single spatha of one leaf; the flower hath one petal, with a slender tube, divided in six parts; three of them are alternately spear-shaped and equal; the other are oval, and at bottom cut into two parts which are vertically heart-shaped. It hath one stamen, which is membranaceous. It hath a round germen supporting a style the length of the tube, which afterward becomes a roundish three-cornered capsule with three cells, filled with seeds.

We have but one Species of this genus in *England*, viz.

KOEMPFERIA *foliis ovatis sessilibus. Flor. Zeyl.* 80. *Koempferia* with oval leaves sitting close to the root; called *Galangale*.

This plant is a native of the *East-Indies*, where the root is greatly used in medicine as a sudorifick, and it is reckoned carminative. It hath much the scent of green *Ginger*, when taken out of the ground; the roots are divided into several fleshy tubers, which are sometimes jointed, and grow about four or five inches long; the leaves are oval, about four inches long and two broad, without foot-stalks, growing close to the root, and seem as if set on by pairs; between these leaves the flowers are produced singly, having no foot-stalks, but are closely embraced by the leaves; the flowers are white, having a bright purple bottom, but are not succeeded by fruit in *England*.

It is a native of hot countries, so will not bear the open air in *England*, but requires a warm stove to preserve it through the winter; the leaves decay in the autumn, therefore the plants should not have too much wet while they are in an inactive state. If these plants are placed in the bark-stove, and treated in the same manner as is directed for the *Ginger*, they will thrive, and produce plenty of flowers every summer. It is propagated by parting of the roots; the best time for this is in the spring, just before they begin to put out their leaves.

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L ABLAB. See *Phaseolus* and *Dolichos*.
LABRUM VENERIS. See *Dipsacus*.
LABURNUM. See *Cytisus*.

LACRYMA JOBI. See *Coix*.

LACTUCA. *Tourn. Inst. R. H.* 473. *tab.* 267. *Lettuce*.

The Characters are,

The flowers are composed of several hermaphrodite florets, inclosed in a scaly oblong empalement. The florets have one petal, which is stretched out on one side like a tongue; these have five short hairy stamina. The germen afterward becomes one oblong pointed seed, crowned with a single down.

It would be to little purpose to mention in this place the several sorts of *Lettuce* that are to be found in botanick writers, many of which are plants of no use, and are never cultivated but in botanick gardens for variety, and some of them are found wild in many parts of *England*. I shall therefore pass over those, and only mention here the several sorts which are commonly cultivated in the kitchen-garden for use: 1. Common, or garden *Lettuce*. 2. *Cabbage Lettuce*. 3. *Cilicia Lettuce*. 4. *Dutch brown Lettuce*. 5. *Aleppo Lettuce*. 6. *Imperial Lettuce*. 7. *Green capuchin Lettuce*. 8. *Versailles*, or upright white *Cos Lettuce*. 9. *Black Cos*. 10. *Red Cos*. 11. *Red capuchin Lettuce*. 12. *Roman Lettuce*. 13. *Prince Lettuce*. 14. *Royal Lettuce*. 15. *Egyptian Cos Lettuce*.

The first of these sorts is commonly sown for cutting very young, to mix with other small *Sallad* herbs, and is only different from the second sort, in being a degeneracy therefrom, or otherwise the second is an improvement by frequent cultivation from the first; for if the seeds are saved from such plants of the second sort as did not cabbage

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closely, the plants produced from that seed will all degenerate to the first sort, which is by the gardeners called *Lapped Lettuce*, to distinguish it from the other, which they call *Cabbage Lettuce*. The seeds of the first, which are commonly saved from any of the plants, without having regard to their goodness, are generally sold at a very cheap rate (especially in dry seasons, when these plants always produce the greatest quantity of seeds,) though sometimes this seed is sold in the seed shops, and by persons who make a trade of selling seeds, for the *Cabbage Lettuce*, which is often the occasion of peoples being disappointed in their crop; so that this sort should never be cultivated but to be cut up very young, for which purpose this is the only good sort, and may be sown any time of the year, observing only in hot weather to sow it on shady borders, and in the spring and autumn upon warm borders, but in winter it should be sown under glasses, otherwise it is subject to be destroyed by severe frosts.

The *Cabbage Lettuce* may also be sown at different times of the year, in order to have a continuation of it through the whole season. The first crop is generally sown in *February*, which should be upon an open warm spot of ground, and when the plants are come up, they should be thinned out to the distance of ten inches each way, which may be done by hoeing them out, as is practised for *Turneps*, *Carrots*, *Onions*, &c. provided you have no occasion for the superfluous plants, otherwise they may be drawn up, and transplanted into another spot of good ground at the same distance, which, if done before the plants are too large, they will succeed very well, though they will not be so large as those which were left upon the spot where they were

were sown, but they will come somewhat later, which will be of service where people do not continue sowing every fortnight.

You must also observe in sowing the succeeding crops, as the season advances, to choose a shady moist situation, but not under the drip of trees, otherwise, in the heat of summer, they will run up to seed before they cabbage. In the middle of *August* you should sow the last crop, which is to stand over winter; the seeds should be sown thin upon a good light soil, in a warm situation; and when the plants are come up, they must be hoed out so as to stand singly, and cut down all the weeds to clear them. In the beginning of *October* they should be transplanted into warm borders, where, if the winter is not very severe, they will stand very well; but in order to be sure of a crop, it will be advisable to plant a few upon a bed pretty close, where they may be arched over with hoops, and in severe frosts they should be covered with mats and straw, or Pease haulm, to secure them from being destroyed; and in the spring of the year, they may be transplanted out into a warm rich soil, at the distance before-mentioned; but still those which grew under the wall, if they escaped the winter, and were suffered to remain, will cabbage sooner than those which are removed; but you must observe not to place them too close to the wall, which would occasion their growing up tall, and prevent their being large or hard.

In order to save good seeds of this kind, you should look over your Lettuces when they are in perfection, and such of them as are very hard, and grow low, should have sticks thrust into the ground, by the sides of as many of them as you intend for seed, to mark them from the rest; and you should carefully pull up all the rest from amongst them as soon as they begin to run up, if any happen to be left, lest when they are run up to flower, they should, by intermixing their farina with the flowers of the good ones, degenerate the seeds.

The *Cilicia*, imperial, royal, black, white, and red Cos Lettuces may be sown at the following times; the first season is the beginning of *February*, upon a gentle hot-bed covered with a frame: the second is the latter end of *February*, or the beginning of *March*, upon a warm border of light soil, in an open situation, *i. e.* not over shadowed with trees; when the plants come up on the hot-bed, they should have a great share of fresh air admitted to them, to prevent their drawing up weak, and when they have four or six leaves, they should be transplanted upon another hot-bed to bring them forward, but this bed may be arched over with hoops and covered with mats. When the plants are strong enough to plant out for good, they should be set at sixteen inches distance each way. Those which were sown on the warm border, should also be transplanted into another spot of ground, at the same distance as the former, observing if the season is dry, to water them till they have taken root; after which they must be carefully kept clean from weeds, which is the only culture they will require, except the black Cos Lettuce, which should be tied up when they are full grown (in the manner as was directed for the blanching of *Endive*.) to whiten their inner leaves, and render them crisp, otherwise they are seldom good for much, rarely cabbaging without this assistance.

When the Lettuces are in perfection, they should be looked over, and as many of the best of them as you intend for seed, should be marked (in the same manner as was before directed for the common Cabbage Lettuce,) being very careful not to suffer any ordinary ones to seed amongst or near them, as was before observed, which would prove more injurious to these sorts than to the common, as being more inclinable to degenerate with us, if they are not carefully preserved.

But to continue these sorts of Lettuce through the season, the seeds must be sown in *April*, *May*, and *June*, observing (as was before directed) to sow the late crops in a shady situation, otherwise they will run up to seed before they grow to any size; in the middle or latter end of *September* there should be some seeds sown of these sorts, to abide the winter, which plants should be transplanted either under glasses, or in a bed, which should be arched over with hoops, in order to be covered in the winter, otherwise in hard winters they are often destroyed; but these plants should have as much free air as possible when the weather is mild, only covering them in hard rains, or frosty weather, for if they are kept too closely covered in winter, they will be subject to mouldiness, which soon rots them.

In the spring these plants should be planted out into a rich light soil, allowing them at least eighteen inches distance each way, for if they are planted too close, they are very subject to grow tall, but seldom cabbage well; and from this crop, if they succeed well, it will be proper to save the seeds; though some plants should also be marked of that crop sown in the spring, because sometimes it happens, that the first may fail by a wet season, when the plants are full in flower, and the second crop may succeed, by having a more favourable season afterward; and if they should both succeed, there will be no harm in that, since the seeds will grow very well when two years old, and if well saved, at three, but this will not always happen.

The most valuable of all the sorts of Lettuce in *England*, are the *Egyptian* green Cos, and the white Cos, the *Cilicia* and red Cos. Though some people are very fond of the Royal and Imperial Lettuces, but they seldom sell so well in the *London* markets as the other, nor are so generally esteemed. Indeed of late years, since the white Cos has been commonly cultivated, it has obtained the preference of all the other sorts, until the *Egyptian* green and the red Cos was introduced, which are so much sweeter and tenderer than the white Cos, that they are by all good judges esteemed the best sorts of Lettuce yet known. These will endure the cold of our ordinary winters full as well as the white Cos; but at the season of their cabbaging, if there happens to be much wet, they are very subject to rot.

The brown *Dutch* and green capuchin Lettuces are very hardy, and may be sown at the same seasons as was directed for the common Cabbage Lettuce, and are very proper to plant under a wall or hedge, to stand the winter, where many times these will live, when most of the other sorts are destroyed, therefore they will prove very acceptable, at a time when few other sorts are to be had; they will also endure more heat and drought than most other sorts of Lettuce, which renders them very proper for late sowing, for it often happens, in very hot weather, that the other sorts of Lettuce will run up to seed in a few days after they are cabbaged, whereas these will abide near three weeks in good order, especially if care be taken to cut the forwardest first, leaving those that are not so hard cabbaged to the last. In saving of these seeds, the same care should be taken to preserve only such as are very large and well cabbaged, otherwise the seeds will degenerate, and be good for little.

If these sorts of Lettuce are planted upon a moderate hot-bed in autumn, and covered with a good frame, they may be cabbaged so well as to be fit for use in *February* and *March*, and may be continued till those in the open air are fit for use.

In saving seeds of all these sorts of Lettuce, you should observe never to let two sorts stand near each other; for by their farina mixing, they will both vary from their original, and partake of each other; there should also be a stake fixed down by the side of each, to which the stem should be fastened,

fastened, to prevent their being broken, or blown out of the ground by wind, to which the *Cilicia*, *Cos*, and the other large growing Lettuces, are very subject when they are in flower. When the seeds begin to ripen, such branches of the large growing Lettuces as ripen first, should be cut, and not wait to have the seed of the whole plant ripe together, which never happens; but, on the contrary, some branches will be ripe a fortnight or three weeks before others, and when they are cut, they must be spread upon a coarse cloth in a dry place, that the seeds may dry; after which they should be beat or rubbed out, and dried again, and then carefully hanged up where mice and other vermin cannot come at them, for if they do, they will soon eat them up.

LACTUCA AGNINI. See Valerianella.

LADY'S SLIPPER. See Cypripedium.

LADY'S SMOCK. See Cardamine.

LAGŒCIA, Bastard Cumin.

The Characters are,

It hath many flowers collected into a head, in one common empalement, composed of eight indented leaves. The flower consists of five horned petals, at the bottom of each flower is situated the germen, attended by five stamina; the germen afterward changes to an oval seed, crowned with the empalement.

There is but one Species of this plant, viz.

LAGŒCIA. *Lin. Hort. Cliff.* Bastard, or Wild Cumin.

We have no other *English* name for this plant, nor is this a very proper one, but as it has been titled by some of the ancient botanists *Cuminum sylvestre*, so it may be stiled wild, or Bastard Cumin in *English*.

This is an annual plant, which grows about a foot high. The leaves resemble those of the Honewort. The flowers, which are of a greenish yellow colour, are collected in spherical heads at the extremity of the shoots; but there being little beauty in the plant, it is rarely cultivated, except in botanick gardens. It grows plentifully about *Aix* in *Provence*, as also in most of the islands of the *Archipelago*. It is annual, and perishes soon after the seeds are ripe. The seeds of this plant should be sown in autumn, sown after they are ripe, or if they are permitted to scatter, the plants will come up, and require no other care but to clear them from weeds. When the seeds are sown in the spring, they commonly remain in the ground a year before they grow, and sometimes I have known them lie two or three years in the ground, so that if the plants do not come up the first year, they should not be disturbed.

LAGOPUS. See Trifolium.

LAMIUM. *Tourn. Inst. R. H.* 183. *tab.* 89. Dead Nettle, or Archangel.

The Characters are,

The flower hath a permanent empalement, which is cut into five equal segments at the top, which end in beards. The flower is of the lip kind, with one petal, swollen at the chaps and compressed; the upper lip is arched, obtuse, and entire; the under is heart-shaped, and indented at the end. It hath four awl shaped stamina, two of which are longer than the other. It hath a four cornered germen, which afterward becomes four three-cornered seeds, sitting in the open empalement.

The Species are,

1. LAMIUM *foliis cordatis obtusis petiolatis. Hort. Cliff.* 314. Purple stinking Archangel, or Dead Nettle.

2. LAMIUM *foliis cordatis acuminatis serratis petiolatis. Hort. Cliff.* 314. White Archangel, or Dead Nettle.

3. LAMIUM *foliis cordatis crenatis villosis, labio floris superiore crenato.* Hoary dead Nettle with a purplish flower, whose upper lip is crenated.

4. LAMIUM *foliis cordatis obtusis glabris, foralibus sessilibus, calicibus profunde incis.* Eastern dead Nettle, sometimes sweet scented, and sometimes stinking, with a large flower.

5. LAMIUM *foliis cordatis nervosis serratis, petiolis longioribus, caule erecto.* Mountain dead Nettle with a Balm leaf.

There are other species of this genus, as also some varieties of it, but as they are many of them weeds, so there are few who care to admit them into their gardens.

The first sort grows naturally in most parts of *England*, under hedges and by the side of highways; it is also a troublesome weed in gardens, but as it stands in most of the dispensaries as a medicinal plant, I have chosen to insert it. This is an annual plant, whose stalks seldom rise more than four or five inches high; the under leaves are heart-shaped, blunt, and stand upon pretty long foot-stalks, but the upper leaves sit nearer to the stalks; the flowers come out in whorls on the upper part of the stalk; they are of a pale purple colour, and are succeeded by four naked seeds sitting in the empalement; after the seeds are ripe the plant decays. It flowers from the middle of *March*, when the autumnal self-sown plants begin, which are succeeded by others, which continue in succession all the summer.

The second sort is commonly called Archangel; this is also used in medicine, for which I have enumerated it here. The roots of this sort are perennial, and creep much in the ground, so are difficult to extirpate, especially where they happen to grow under bushes and hedges, for the roots intermix with those of the bushes, and every small piece of them will grow and spread. The stalks of this rise much higher than those of the last, the flowers are larger, white, and grow in whorls round the stalks; these continue in succession most part of the summer.

The third sort grows naturally upon the mountains in *Italy*; this hath a perennial creeping root, from which arise many thick square stalks a foot high, garnished with heart-shaped leaves which are hairy, placed opposite, standing upon pretty long foot-stalks; the flowers come out in whorls at the joints of the stalk, they are large, of a pale purplish colour, and continue in succession most part of the summer; the flowers are succeeded by seeds, which ripen about six weeks after. This may be propagated by seeds, but as the roots spread greatly in the ground, so when once it is obtained, it will propagate fast enough without care.

The fourth sort grows naturally in the *Archipelago*; this is an annual plant, which, if permitted to scatter its seeds, the plants will come up in the autumn, and thrive better than when sown by hand. The plants during the winter make a pretty appearance, for the leaves are marked with white spots, somewhat like those of the autumnal Cyclamen; the stalks rise eight or nine inches high, garnished with smooth heart-shaped leaves placed opposite; these in dry weather have a musky scent, but in wet weather are fetid; the flowers are white, standing in whorls round the stalks. They appear in *April*, and the seeds ripen in *June*, then the plants decay; this requires no culture, but to keep the plants clear from weeds.

The fifth sort grows naturally in *Portugal*; this hath a perennial root; the stalk rises a foot and a half high, it is strong, square, and grows erect; the leaves are large, heart-shaped, and much veined; they are deeply sawed on their edges, and are placed opposite. The flowers come out in whorls round the stalks at every joint, they are very large, of a deep purple colour; those on the lower part of the stalks appear the beginning of *May*, which are succeeded by others above, so that there is a continuance of flowers almost two months on the same stalks. This plant very rarely produces good seeds in *England*, nor do the roots propagate very fast, so that it is not common in *England*.

The best time to remove and part these roots is in *October*, but they must not be transplanted oftener than every third year, if they are required to flower strongly, for the great beauty of this plant consists in the number of stalks, which are always proportional to the size of the roots, for small ones

ones will put one or two stalks only, whereas the large ones will have eight or ten. The roots are hardy, and will thrive best in a soft loamy soil.

LAMPSANA. See Lapsana.

LAND. Its Improvement.

1. By Inclosing.

Inclosing of lands, and dividing the same into several fields, for pasture or tillage, is one of the principal ways of improvement; first, by ascertaining to every man his just property, and thereby preventing an infinity of trespasses and injuries, that lands in common are subject unto, beside the disadvantage of being obliged to keep the same seasons with the other people who have land in the same field; so that the sowing, fallowing, and tilling the ground, must be equally performed by all the landholders; and when there happens a slothful negligent person, who has land intermixed with others, it is one of the greatest nuisances imaginable. Secondly, where land is properly inclosed, and the hedge-rows planted with timber trees, &c. it preserves the land warm, and defends and shelters it from the violent cold nipping winds, which, in severe winters, destroy much of the Corn, pulse, or whatever grows on the champain grounds. And where it is laid down for pasture, it yields much more Grass than the open fields, and the Grass will begin to grow much sooner in the spring. The hedges and trees also afford shelter for the cattle from the cold winds in winter, and shade for them in the great heats of summer. These hedges also afford the diligent husbandman plenty of fuel, as also plough-boot, cart-boot, &c. And where they are carefully planted and preserved, furnish him with mast for his swine; or where the hedge-rows are planted with fruit trees, there will be a supply of fruit for cyder, perry, &c. which in most parts of *England* are of no small advantage to the husbandman.

By this method of inclosing, there is also much more employment for the poor, and is therefore a good remedy against beggary; for in those open countries, where there are great downs, commons, heaths, and wastes, there is nothing but poverty and idleness to be seen amongst the generality of their inhabitants.

In inclosing of land, regard should be had to the nature of the soil, and what it is intended for, because Corn land should not be divided into small fields; for besides the loss of ground in hedges, &c. the Corn doth seldom thrive so well in small inclosures, as in more open land, especially where the trees are large in the hedge-rows. The Grass also in pasture is not so sweet near hedges, or under the drip of trees, as in an open exposure; so that where the inclosures are made too small, or the land over-planted with trees, the herbage will not be near so good, nor in so great plenty, as in larger fields; therefore, before a person begins to inclose, he should well consider how he may do it to the greatest advantage: as for instance, it is always necessary to have some smaller inclosures near the habitation, for the shelter of cattle, and the conveniency of shifting them from one field to another, as the season of the year may require; and hereby the habitation, barns, stables, and out-houses, will be better defended from strong winds, which often do great damage to those that are exposed to their fury. These small inclosures may be of several dimensions, some of them three, four, six, or eight acres in extent; but the larger divisions for Corn should not contain less than twenty or thirty acres or more, according to the size of the farm.

The usual method of inclosing land is, with a ditch and bank set with Quick. But in marsh land, where there is plenty of water, they content themselves with only a ditch, by the sides of which they usually plant Sallows or Poplars, which being quick of growth, in a few years afford shade to the cattle; and when they are lopped, produce a

considerable profit to their owners. In some counties the divisions of their lands is by dry walls made of flat stones, laid regularly one upon another, and laying the top course of stones in clay, to keep them together, the weight of which secures the under ones. But in some parts of *Suffex* and *Hampshire* they often lay the foundation of their banks with flat stones, which is of a considerable breadth at bottom; upon which they raise the bank of earth, and plant the hedge on the top, which in a few years makes a strong durable fence, especially if they are planted with Holly, as some of those in *Suffex* are.

I shall now mention the most proper plants for making of fences for the different soils and situations, so as to answer the expectation of the planter: and first, the white Thorn is esteemed the best for fencing, and will grow upon almost any soil and in any situation, but it succeeds best on a Hazle loam.

The next to the white is the black Thorn, which, though not so generally esteemed as the white, yet it will make an excellent fence, where proper care is taken in the planting and after management of it; and the loppings of this hedge make much the best bushes, and are of longer duration for dead hedges, than any other sort, and are very proper to mend gaps in fences. These hedges will be better, if the plants are raised from the stones of the fruit, which should be sown on the spot where they are to remain, than where the plants are taken from a nursery.

The Crab will also make a strong durable fence; this may be raised by sowing the kernels in the place where the hedge is designed, but then there should be great care taken of the plants while they are young, to keep them clear from weeds, as also to guard them from cattle. When these stocks have obtained strength, some of them may be grafted with Apples for cyder, where the fence is not exposed to a publick road; but the grafts should not be nearer than thirty-five or forty feet, lest they spoil the hedge, by their heads overgrowing and dripping on it.

The Holly is also an excellent plant for ever-green hedges, and would claim the preference to either of the former, were it not for the slowness of its growth while young, and the difficulty of transplanting the plants when grown to a moderate size. This will grow best in cold stony lands, where, if once it takes well, the hedges may be rendered so close and thick, as to keep out all sorts of animals, and will grow to a great height, and is of long duration.

The Alder will also make a good hedge, when planted on a moist soil, or on the side of rivers, or large ditches; and will preserve the bank from being washed away, where there are running streams; for they spread pretty much at bottom, and send forth suckers from their roots in great plenty.

Of late years the Furz has been propagated for hedges in several parts of *England*, and indeed will make a good fence on poor, sandy, or gravelly soils, where few other plants will grow. The best method of raising these hedges is, to sow the seed about the latter end of *March*, or the beginning of *April*, in the place where the hedge is designed; for the plants will not bear to be transplanted, unless it be done while they are young, and then there is great hazard of their taking.

Elder is sometimes planted for hedges, being very quick of growth; so that if sticks or truncheons about four or five feet long be thrust into a bank slopewise each way, so as to cross each other, and thereby form a sort of chequer work, it will make a fence for shelter in one year. But as this is a vigorous growing plant, it will never form a close fence; and the young shoots being very soft and pithy, are soon broken by cattle, or boys in their sport,

There are some other plants which have been recommended for fences, but those here enumerated are the only

useful for such purposes; wherefore I shall pass over the others, as not worthy of the care of the husbandman. And as to the farther directions for planting and preserving of hedges, with instructions for plashing or laying them, the reader is desired to turn to the articles of FENCES and HEDGES, where there are particular directions for these works exhibited, which I shall not here repeat.

The draining of land is also another great improvement to it; for though meadows and pastures, which are capable of being overflowed, produce a greater quantity of herbage than dry land, yet where the wet lies too long upon the ground, the Grass will be four and extremely coarse; and where there is not care taken in time to drain this land, it will produce little Grass, and soon be over-run with Rushes and Flags, so as to be of small value.

The best method for draining of these lands is, to cut several drains across the land, in those places where the water is subject to lodge; and from these cross drains to make a convenient number of other drains, to carry off the water to either ponds or rivers in the lower parts of the land. These drains need not be made very large, unless the ground be very low, and so situated as not to be near any river to which the water may be conveyed; in which case there should be large ditches dug at proper distances, in the lowest part of the ground, to contain the water, and the earth which comes out of the ditches should be equally spread on the land, to raise the surface. But where the water can be conveniently carried off, the best method is to make under-ground drains at proper distances, which may empty themselves into large ditches, which are designed to carry off the water. These sort of drains are the most convenient, and as they are hid from the sight, do not incommode the land, nor is there any ground lost where these are made.

The usual method of making these drains is to dig trenches, and fill the bottoms with stones, bricks, Rushes, or bushes, which are covered over with the earth, which was dug out of the trenches; but this is not the best method, because the water has not a free passage through these drains, so that whenever there is a flood, they are often stopped by the soil which the water frequently brings down with it. The best method I have yet found to make these drains is to dig trenches to a proper depth for carrying off the water, which for the principal drains should be three feet wide at their top, and sloped down for two feet in depth, where there should be a small bank left on each side, upon which the cross stakes or bearers should be laid, and below these banks there should be an open drain left; at least one foot deep, and nine or ten inches wide, that there may be room for the water to pass through: these larger drains should be at convenient distances, and smaller drains of about six or seven inches wide, and the hollow under the bushes eight or nine inches deep, should be cut across the ground, which should discharge the water into these larger drains. The number and situation of them must be in proportion to the wetness of the land, and the depth of earth above the bushes must also be proportioned to the intended use of the land; for if it is arable land to be ploughed, it must not be shallower than a foot or fourteen inches, that there may be sufficient depth for the plough, without disturbing the bushes, but for pasture-land nine inches will be full enough; for when the bushes lie too deep in strong land, they will have little effect, the ground above will bind so hard, as to detain the wet on the surface. When the drains are dug, there should be prepared a quantity of good brush wood, the larger sticks should be cut out to lengths of about sixteen or eighteen inches, which should be laid across upon the two side-banks of the drain, at about four inches distance; then cover these sticks with the smaller Brush-wood, Furz, Broom,

Heath, or any other kind of Brush, laying it lengthwise pretty close; on the top of these may be laid Rushes, Flags, &c. and then the earth laid on to cover the whole. These sort of drains will continue good for a great number of years, and are never liable to the inconveniencies of the other, for the water will find an easy passage through them under the bushes; and where there is plenty of Brush-wood, they are made at an easy expence; but in places where wood is scarce, it would be chargeable to make them: however; in this case, it would be a great advantage to these lands to plant a sufficient number of cuttings of Willow, or the black Poplar, on some of the moist places, which would furnish Brush-wood for these purposes in four or five years; and as the expence of planting these cuttings is trifling, there cannot be a greater advantage to an estate which wants draining, than to practise this method, which is in every person's power, since there is little expence attending it.

In countries where there is plenty of stone, that is the best material for making these under-ground drains; for when these are properly made, they will never want repairing.

The best time of the year for making these drains is about *Michaelmas*, before the heavy rains of autumn fall, because at this season the land is usually dry, so that the drains may be dug to a proper depth; for when the ground is wet, it will be very difficult to dig to any depth, because the water will drain in where-ever there is an opening in the ground.

As the draining of cold wet lands is a great improvement to them, so the floating or watering of dry loose land is not a less advantage to them. This may be easily effected where there are rivers, or reservoirs of water, which are situated above the level of the ground designed to be floated, by under-ground drains (made after the manner of those before directed for draining of land,) through which the water may be conveyed at proper seasons, and let out on the ground: in order to this, there must be good sluices made at the heads of the drains, so that the water may never get out, but at such times as is required; for if this be not taken care of, the water, instead of improving the land, will greatly damage it.

The time for drowning of land is usually from *November* to the end of *April*; but though this is the general practice, yet I cannot approve of it for many reasons. The first is, that by the wet lying continually on the ground in winter, the roots of the finer sort of Grass are rotted and destroyed; and by letting on of the water, at the season when the seeds of Docks, and other bad weeds, which commonly grow by river sides, are falling, these seeds are carried upon the land, where they remain and grow, and fill the ground with bad weeds, which is commonly the case with most of the water meadows in *England*, the Grass in general being destroyed; so that Rushes, Docks, and other trumpery, make up the burden of these lands; but if these meadows were judiciously managed, and never floated till *March* or *April*, the quantity of sweet good Grass would be thereby greatly increased, and the beautiful verdure of the meadows preserved.

Another great improvement of land is by burning of it, which for sour, heathy, and rushy land, be it either hot or cold, wet or dry, is a very great improvement; so that such lands will, in two or three years after burning, yield more, exclusive of the charges, than the inheritance was worth before; but this is not to be practised on rich fertile land, for as the fire destroys the acid juice, which occasions sterility in the poor land, so it will in like manner consume the good juices of the richer land, and thereby impoverish it, so that it hath been with great reason disused in deep rich countries.

It is also a very great improvement, where land is overgrown with Broom, Furz, &c. to stub them up by the roots; and when they are dry, lay them on heaps, and

Cover them with the parings of the earth, and burn them, and spread the ashes over the ground. By this method vast tracts of land, which at present produce little or nothing to their owners, might be made good at a small expence, so as to become good estates to the proprietors.

LANTANA. *Lin. Gen. Plant.* 683. *American Viburnum.*

The Characters are,

The empalement of the flower is cut into four segments. The flower is of an irregular shape, having a cylindrical tube spread open at the bottom, where it is divided into five parts. In the center of the flower is situated the germen, attended by four stamina, two being longer than the other. The germen afterward changes to a roundish fruit, opening into two cells, inclosing a roundish seed.

The Species are,

1. LANTANA *foliis oppositis, caule aculeato ramoso, floribus capitato-umbellatis.* Sweet, prickly, *American Viburnum*, with broad Nettle leaves, and carmine flowers.

2. LANTANA *caule inermi, foliis lanceolatis dentatis alternis, floribus corymbosis.* Smooth Lantana, with spear-shaped leaves placed alternate, and a smaller flower and fruit.

3. LANTANA *caule ramoso lanuginoso, foliis orbiculatis crenatis, oppositis, floribus capitatis.* Lantana with a hairy branching stalk, round crenated leaves placed opposite, and flowers collected in heads.

4. LANTANA *foliis ternis, spicis oblongis imbricatis.* *Lin. Sp. Plant.* 626. Lantana with leaves placed by threes round the stalk, and oblong imbricated spikes of flowers.

5. LANTANA *caule aculeato, foliis oblongo-cordatis serratis oppositis, floribus corymbosis.* Lantana with a prickly stalk, oblong, heart-shaped, sawed leaves placed opposite, and flowers growing in a corymbus.

6. LANTANA *caule inermi, foliis ovato-lanceolatis, serratis, rugosis, floribus capitatis lanuginosis.* Lantana with a smooth stalk, oval, spear-shaped, rough, sawed leaves, and flowers growing in woolly heads.

7. LANTANA *foliis oblongo-ovatis acuminatis serratis rugosis alternis, floribus capitatis.* Lantana with oblong, oval-pointed, sawed leaves, which are rough, and placed alternate, and flowers growing in heads.

8. LANTANA *caule inermi, foliis ovatis serratis, floribus capitatis alaribus sessilibus.* Lantana with a smooth stalk, oval sawed leaves, and flowers growing in heads, proceeding from the wings of the leaves, sitting close to the stalks.

9. LANTANA *foliis alternis sessilibus, floribus solitariis.* *Hort. Cliff.* 320. Lantana with alternate leaves sitting close to the stalks, and flowers growing singly; commonly called *African Jasmine* with an flex leaf.

The first sort is pretty common in the *English* gardens. This grows naturally in *Jamaica*, and most of the other islands in the *West-Indies*, where it is called wild Sage: It rises with a woody stalk three or four feet high, sending out many square branches, armed with short crooked spines. The leaves are hairy, spear-shaped, and placed opposite; toward the end of the branches the flowers come out from the wings of the stalks, two foot-stalks arising from the same joint, one on each side, and are terminated by roundish heads of flowers; those which are on the outside, and form the border, are first of a bright red, or scarlet colour; these change to a deep purple before they fall. Those flowers which are in the center, are of a bright yellow, but after some time fade to an Orange colour. The flowers are succeeded by roundish berries, which, when ripe, turn black, having a pulpy covering over a single hard seed.

The second sort grows naturally in *Jamaica*. This rises with a slender, smooth, shrubby stalk, about four feet high, dividing into many small branches, which are garnished with spear-shaped leaves, indented on their edges, hoary on their under side, and stand alternate upon short foot-stalks.

Toward the end of the branches the foot-stalks of the flowers arise alternately from the wings of the leaves, which support small heads of pale purple flowers, succeeded by small purple berries, each having one seed.

The third sort was sent me from *La Vera Cruz*, by the late *Dr. Houstoun*. This rises with a shrubby stalk about four feet high, dividing into several woolly branches. The leaves are oblong, and sawed on their edges, standing opposite. The foot-stalks of the flowers come out from the wings of the leaves, sustaining an oblong spike of purple flowers.

The fourth sort rises with a shrubby stalk about three feet high, covered with a gray woolly bark, garnished with oblong leaves, indented on their edges; they are placed opposite at bottom, but by threes on the upper part of the stalk. At the end of the branches arise the foot-stalks of the flowers, which sustain an oblong head of purple flowers, which come out of imbricated cups, and are succeeded by pretty large purple berries, containing one seed. This flowers at the same time with the former sorts, and is an annual plant.

The fifth sort was sent me from *La Vera Cruz*, by the late *Dr. Houstoun*. This rises with a prickly branching stalk four or five feet high, garnished with oblong heart-shaped leaves, which are sawed on their edges, and end in acute points. At the end of the branches the flowers come out in round bunches, standing upon slender foot-stalks. The flowers are yellow, and grow in looser bunches or heads, than those of the former sorts.

The sixth sort rises with a smooth branching stalk five or six feet high, covered with a dark brown bark. The branches are more divided than those of most other sorts, and are much more ligneous. The leaves are deeply sawed on their edges, their upper surface very rough, and many of them closely set with white prominent spots as if fludded; these are placed alternately on the branches. The flowers come out from the wings of the stalk, standing upon pretty long foot-stalks; they are white, and are collected in small woolly heads.

The seventh sort rises with a branching shrubby stalk about four feet high, covered with a dark brown bark, garnished with small, oblong, oval leaves, ending in acute points, standing alternately pretty close to the branches. The flowers come out at the end of the branches, upon short foot-stalks in close small heads; these are white, and make but little appearance.

The eighth sort was sent me from *Campeachy*. This hath a slender shrubby stalk, which rises three or four feet high, dividing into many slender branches, garnished with small, oval, sawed leaves, placed opposite; from the wings of the stalk, at every joint, come out the flowers; they are small, white, and are collected in close heads.

These plants are all of them easily propagated by cuttings, except the fourth, which is an annual plant, so can only be propagated by seeds. They may also be propagated by seeds, which several of the sorts produce in *England*. These seeds should be sown in pots, and plunged into a hot-bed of tan; the reason for my advising them to be sown in pots, is, because the seeds frequently remain long in the ground before they vegetate; therefore if the plants should not come up the same year, the pots should be placed in the stove in winter, and the following spring plunged into a new hot-bed, which will bring up the plants. When these are fit to remove, they should be each planted in a small pot, and plunged into another hot-bed, observing to shade them till they have taken new root; then they should have air admitted to them every day, in proportion to the warmth of the season, to prevent their being drawn up with weak stalks; afterward they must be treated in the same manner

as other plants from the same country, till they have obtained strength; then they may be removed into an airy glass-case, or a dry stove, where they may have a large share of air in warm weather, but protected from the cold. This is necessary for the young plants, which should not the first year be exposed to the open air, but afterward they may be placed abroad in the warmest part of summer, and in winter placed upon stands in the dry stove, where they will continue long in flower, and many of the sorts will ripen their seeds; but in winter they should be sparingly watered, for much moisture will rot their roots.

If they are propagated by cuttings, the best time for planting them is in *July*, after the plants have been exposed to the open air for about a month, by which time the shoots will be hardened so as to be out of danger of rotting with a little moisture. These cuttings should be planted in small pots, and plunged into a moderate hot-bed, and screened from the violence of the sun in the middle of the day; in about six weeks time these will be rooted, when they must be hardened gradually to bear the open air, and afterward treated as the old plants.

The last sort has been long in the *English* gardens, and is commonly called the *Ilex-leaved Jasmine*. This sort rises with a shrubby stalk five or six feet high, sending out many irregular branches, closely garnished with thin oval leaves ending in points, sawed on their edges, which embrace the branches with their base, and from the bosom of each leaf comes out one solitary white flower, which is cut at the top into five parts, and at first sight has the appearance of a *Jasmine* flower, but when closer viewed, the tube will be found curved in the same manner with those which *Dr. Linnæus* titles ringent flowers. The flowers are not succeeded by seeds in *England*, but the plants are easily propagated by cuttings, which, if planted upon an old hot-bed any time in *July*, and covered with a bell or hand-glass, and shaded from the sun, will put out roots in a month or five weeks; then they may be planted in pots, and placed in the shade till they have taken fresh root; after which they may be removed to a sheltered situation, where they may remain till the frosts come on. This plant was brought from the *Cape of Good Hope*, so is not very tender, therefore may be preserved in a good green-house in winter, but must have a large share of air in mild weather, otherwise it is apt to grow mouldy. In the summer it may be exposed in the open air, with other green-house plants, in a sheltered situation. There is a succession of flowers upon the plants most part of the year, and the leaves continuing green renders it worthy of a place in every collection of plants.

LAPATHUM. *See* Rumex.

LAPSANA. *Lin. Gen. Plant.* 823. Nipplewort.

The Characters are,

The flower is composed of several hermaphrodite florets, included in one common imbricated empalement. The florets have one tubulous petal, stretched out at the top, in shape of a tongue; these have each five short hairy stamina. The germen is situated at the bottom of the floret, which afterward becomes an oblong three-cornered seed, situated in the scale of the empalement.

The Species are,

1. LAPSANA calycibus fructibus angulatis, pedunculis tenuibus ramosissimis. *Hort. Cliff.* 334. Common Nipplewort.

2. LAPSANA calycibus fructibus undique patentibus, radiis subulatis, foliis lanceolatis indivisis. *Hort. Upsal.* 245. This is the *Rhagadiolus alter.* 511.

3. LAPSANA calycibus fructibus undique patentibus, radiis subulatis, foliis lyratis. *Hort. Upsal.* 245. *Rhagadiolus* with a Nipplewort leaf.

4. LAPSANA calycibus fructibus torulosis depressis obtusis sessilibus. *Lin. Sp. Plant.* 811. *Zacintha*, or watered Cichory.

The first sort is a common weed, which grows by the

side of foot-paths and hedges in most parts of *England*, so is not permitted to have room in gardens.

The second and third sorts grow naturally in *Portugal*. These are annual plants, of no beauty or use, but are preserved in botanick gardens for the sake of variety. If the seeds of these are permitted to scatter, the plants will come up without trouble, and two or three of them will be enough to leave to keep the sorts.

The fourth sort grows naturally in *Italy*. This is also an annual plant, of neither use or beauty, but is like the others kept for variety. If the seeds of this sort scatter in the autumn, the plants will come up better than if sown in the spring. The plants require no culture, but will thrive like weeds.

LARIX. *Tourn. Inst. R. H.* 586. *tab.* 353. The Larch tree.

The Characters are,

It hath male and female flowers, growing separate on the same tree. The male flowers are disposed in a scaly katkin. The female flowers are disposed in a conical shape, having no petals, but a small germen, which afterward becomes a nut with a membranous wing, inclosed in the scales of the cones.

The Species are,

1. LARIX foliis deciduis, conis ovatis obtusis. Larch tree with deciduous leaves, and oval obtuse cones.

2. LARIX foliis acutis perennantibus, conis obtusis. Cedar of *Libanus*.

The first sort grows naturally upon the *Alps* and *Apennines*, and of late years has been very much propagated in *England*. This tree is of quick growth, the trunk will rise to the height of fifty feet or more; the branches are slender, their ends generally hang downward, and are garnished with long narrow leaves, which arise in clusters from one point, which spread open above like the hairs of a painter's brush; they are of a light green, and fall away in autumn, like other deciduous trees. In the month of *April* the male flowers appear, which are disposed in form of small cones; the female flowers are collected into oval obtuse cones, which in some species have bright purple tops, and in others they are white: these differences are accidental; the cones are about one inch long, obtuse at their points, the scales are smooth, and lie over each other; under each scale there is generally lodged two seeds, which have wings.

There are two other varieties of this tree, one of which is a native of *America*, and the other of *Siberia*; these have different appearances from the common Larch tree, in their shoots and leaves, but it is doubtful if they are specifically different. The *American* sort thrives pretty well in several gardens in *England*, but the latter requires a colder climate, for they are very apt to die in summer here, especially if they are planted on a dry soil. This sort will often push out leaves by the end of *February* in mild seasons, and if there happens frost later in the year, the shoots are frequently killed, and their leaves drop off, so are sometimes naked till *June*, when the trees put out fresh shoots. The cones of this sort, which have been brought to *England*, seem to be in general larger than those of the common kind.

The common Larch is now very plenty in most of the nurseries in *England*, and of late years there has been great numbers of the trees planted; but those which have been planted in the worst soil and in bad situations, have thriven the best, for where trees of equal size have been planted in good garden earth at the same time, the others on the cold stiff land have in twelve years been twice the height of those planted in good ground, which is an encouragement to plant these trees, since they will thrive in the most exposed situations, provided they are planted in clumps near each other, and not single trees; nor should the plants, which are planted in very open exposed places, be taken from warm nurseries,

nurseries, but rather raised as near to the spot where they are to remain, as possible; nor should the plants be more than three or four years growth when planted, where they are designed to grow large; for though trees of greater size will remove very well, and grow several years as well as if they had not been transplanted, yet after twenty or thirty years growth they will frequently fail, where the young planted trees have continued very vigorous.

These trees are raised from seeds, which most years ripen well in *England*. The cones should be gathered about the end of *November*, and kept in a dry place till the spring, when they should be spread on a cloth and exposed to the sun, or laid before a fire, which will cause the scales of the cones to open, and emit their seeds. These seeds should be sown on a border exposed to the east, where the morning sun only comes on it; or if they are sown on a bed more exposed to the sun, they should be screened with mats in the middle of the day, for when the plants first appear above ground, they are very impatient of heat; and when the bed is much exposed to the sun, the surface of the ground will dry so fast as to require to have water very often, which frequently rots the tender roots of the plants. These young plants should be constantly kept clean from weeds, and if they have made good progress they may be transplanted the following autumn, otherwise they may remain in the seed-bed another year, especially if the plants are not too close together. When they are transplanted, it should be performed in the autumn, as soon as their leaves decay; they may be planted in beds at about six inches asunder each way, which will be distance enough for the growth of the plants the two following years, by which time they will be fit to transplant where they are to remain.

When the young trees are planted out for good, they need not be planted at more than eight or ten feet asunder, always planting them closer on exposed situations, than where they are more defended; after the trees are planted they will require no other care but to keep them clean from weeds for three or four years till they have obtained strength, when they will over-top the weeds, and prevent their growth; the ground between these trees should not be dug, for that I have found has greatly stopped their growth.

The *American* or black Larch, thrives pretty well upon moist land, but on dry ground will make but little progress. A few of these trees, by way of variety, may be allowed to have place in every collection of trees designed for pleasure, but for profit the common Larch is to be preferred.

In *Switzerland*, where these trees abound, and they have a scarcity of other wood, they build most of their houses with it; and great part of their furniture is also made of the wood, some of which is white, and some red, but the latter is most esteemed. The redness of the wood is supposed to be from the age of the trees, and is not from any difference between them. They frequently cut out the boards into shingles of a foot square, with which they cover their houses, instead of tiles or other covering; these are at first very white, but after they have been two or three years exposed become as black as charcoal; and all the joints are stopped by the resin, which the sun draws out from the pores of the wood, which is hardened by the air, and becomes a smooth shining varnish, which renders the houses so covered impenetrable to either wind or rain; but as this is very combustible, so the magistrates have made an order of police, that the houses so covered should be built at a distance from each other.

In most countries where this wood is in plenty, it is preferred to all the kinds of Fir for every purpose; and in many places there are ships built of this wood, which they say are durable; therefore this may be a very proper tree for planting upon some of the cold barren hills in many

parts of *England*, which at present produce nothing to their proprietors, and in one age may be large estates to their posterity, and a national advantage; which might be effected without a great expence, where the business is properly conducted.

From the Larch tree is extracted the *Venice turpentine*, which the inhabitants of the valley of *St. Martin*, near *Lucern*, make a considerable merchandize of. They collect this by boring holes in the trunk of the trees, at about two or three feet from the ground, into which they fix narrow troughs about twenty inches long; the end of these are hollowed like a ladle, and in the middle is a small hole bored for the turpentine to run into a receiver, which is placed below it; as the turpentine runs from the trees, it passes along the sloping gutter or trough to the ladle, and from thence runs through the hole into the receiver. The people who gather this visit the trees morning and evening, from the end of *May* to *September*, to collect the turpentine from out of the receivers.

The second sort is the Cedar of *Libanus*, which is a tree of antiquity; and what is remarkable, this tree is not found as a native in any other part of the world, so far as hath come to our knowledge.

The cones of this tree are frequently brought from the *Levant*, which, if preserved entire, will preserve their seeds good for several years. The time of their ripening is commonly in the spring, and so consequently are near one year old before we receive them; for which they are not the worse, but rather the better, the cones having discharged a great part of their resin by lying, and the seeds are much easier to get out of them than such as are fresh taken from the tree.

The best way to get the seeds out is, to split the cones, by driving a sharp piece of iron through the center lengthways, which will split the cone, then the seeds may be taken out with ease; these are fastened to a thin leafy substance called wings, like those of the Fir tree: but before the seeds are taken out, it will be proper to put the cones in water for twenty-four hours, which will render them easier to split, so that the seeds may be taken out with greater safety; for there will require care in the doing of it, otherwise many of the seeds will be spoiled, as they are very tender, and will bruise where there is any force employed to get them out.

These seeds should be sown in boxes or pots of light fresh earth, and treated as was directed for the Firs (to which I refer the reader) but only shall observe, that these require more shade in summer while young than the Firs.

When the plants come up, they must be guarded from the birds, otherwise they will pick off their tops; they must also be constantly kept clean from weeds, and not placed under the drip of trees. The plants may remain in these boxes or pots in which they were sown till the following spring, but it will be proper to place them under a frame in winter, or cover them with mats, for while they are young they are in danger of losing their tops, if they are pinched by frost. In the spring, before the plants begin to shoot, they should be carefully taken up and transplanted into beds at about four inches distance, closing the earth gently to their roots; these beds should be arched over with hoops, and covered with mats in the heat of the day, to shade the plants from the sun till they have taken new root; and if the nights prove frosty, it will be proper to keep the mats over them in the night, but in cloudy or moist weather they must be always open. After the plants are well rooted, they will require no other care but to keep them clean from weeds, unless the season should prove very dry, in which case it will be proper to give them some water once a week; but it must be in small quantities, for

too much wet is often very injurious to them, so that it will be better to screen them from the sun in hot weather, to prevent the earth from drying too fast, or cover the surface of the ground with moss to keep it cool, than to water the plants often,

In these beds the plants may stand two years, then they should be either transplanted to the places where they are designed to remain, or to a nursery, where they may grow two years more; but the younger these plants are when they are planted out for good, the better the trees will thrive, and the longer they will continue.

When these plants begin to shoot strong, the leading shoot is very subject to incline to one side; therefore, in order to have them strait, their shoots must be supported with stakes, to keep the leaders strait, until they are grown to the height they are designed, otherwise their branches will extend on every side, and prevent their upright growth.

It is matter of surprize to me, that this tree hath not been more cultivated in *England* formerly, for till within a few years past there were but few here; for as it grows naturally upon the coldest parts of mount *Libanus*, where the snow continues most part of the year, so there can be no fear of its being hurt by frost in *England*. That these trees are of quick growth, is evident from four of them now growing in the physick garden at *Chelsea*, which (as I have been credibly informed) were planted there in the year 1683, at which time they were not above three feet high; two of which trees are at this time (*viz.* 1762) near twelve feet in girt, at two feet above ground, and their branches extend more than thirty feet on every side their trunks.

The soil in which these trees are planted, is a lean hungry sand, mixed with gravel, with about two feet surface. They stand at four corners of a pond, which is bricked up within two feet of their trunks, so that their roots have no room to spread on one side, and consequently are cramped in their growth; but whether their standing so near the water may not have been advantageous to them, I cannot say; but sure I am, if their roots had had full scope in the ground, they would have made a greater progress. I have also observed, that lopping or cutting of these trees is very injurious to them (more perhaps than to any other of the resinous trees) in retarding their growth; for two of the four trees above-mentioned, being unadvisedly planted near a green-house, when they began to grow large, had their branches lopped, to let the rays of the sun into the house, whereby they have been so much checked, as at present they are little more than half the size of the other two.

What we find mentioned in scripture of the lofty Cedars, can be no ways applicable to the common growth of this tree; since, from the experience we have of those now growing in *England*, as also from the testimony of several travellers, who have visited those few remaining trees on mount *Libanus*, they are not inclined to grow very lofty, but on the contrary extend their branches very far; to which the allusion made by the Psalmist agrees very well, when he is describing the flourishing state of a people, and says, *They shall spread their branches like the Cedar tree.*

Rauwolf, in his *Travels*, says, there were not at that time (*i. e.* anno 1574) upon mount *Libanus* more than twenty-six trees remaining, twenty-four of which stood in a circle; and the other two, which stood at a small distance, had their branches almost consumed with age; nor could he find any younger trees coming up to succeed them, though he looked about diligently for some. These trees (he says) were growing at the foot of a small hill, on the top of the mountains, and amongst the snow. These having very large branches, commonly bend the tree to one side, but are extended to a great length, and in so delicate and pleasant order, as if they were trimmed and made even with

great diligence, by which they are easily distinguished at a great distance from Fir trees. The leaves (continues he) are very like to those of the Larch tree, growing close together in little bunches, upon small brown shoots.

Maundrel, in his *Travels*, says, there were but sixteen large trees remaining, when he visited the mountains, some of which were of a prodigious bulk, but that there were many more young trees of a smaller size; he measured one of the largest, and found it to be twelve yards six inches in girt, and yet found, and thirty-seven yards in the spread of its boughs. At about five or six yards from the ground it was divided into five limbs, each of which was equal to a great tree. What *Maundrel* hath related, was confirmed to me by a worthy gentleman of my acquaintance, who was there in the year 1720, with this difference only, *viz.* in the dimensions of the branches of the largest tree, which he assured me he measured, and found to be twenty-two yards diameter. Now, whether Mr. *Maundrel* meant thirty-seven yards in circumference of the spreading branches, or the diameter of them, cannot be determined by his words, yet neither of them well agrees with my friend's account.

The wood of this famous tree is accounted proof against all putrefaction of animal bodies; the saw-dust of it is thought to be one of the secrets used by those mountebanks, who pretend to have the embalming mystery. This wood is also said to yield an oil, which is famous for preserving books and writings; and the wood is thought by my Lord *Bacon*, to continue above a thousand years sound. It is also recorded, that in the temple of *Apollo* and *Utica*, there was found timber of near two thousand years old. And the statute of the goddess, in the famous *Ephesian* temple, was said to be of this material also, as was most of the timber work of that glorious structure.

This sort of timber is very dry and subject to split, nor does it well endure to be fastened with nails, from which it usually shrinks, therefore pins of the same wood are much preferable to any other.

LARKSPUR. See Delphinium.

LASERPITIUM. *Tourn. Inst. R. H.* 324. *tab.* 172. Laserwort.

The Characters are,

It hath an umbellated flower, composed of many small umbels. The general umbel is uniform; the flowers have five equal heart-shaped petals, and five stamina. The roundish germen is situated under the flower, which afterward becomes an oblong fruit with eight longitudinal wings or membranes, resembling the fiers of a water mill.

The Species are,

1. LASERPITIUM *foliolis oblongo-cordatis, inciso-serratis, umbellâ maximâ.* Laserwort with oblong heart-shaped lobes, which are cut like a saw, and a very large umbel.

2. LASERPITIUM *foliolis cordatis inciso-serratis.* Hort. Cliff. 96. Laserwort with heart-shaped lobes cut like a saw.

3. LASERPITIUM *foliolis ovatis obtusis acutè serratis.* Laserwort with oval obtuse lobes, sharply sawed.

4. LASERPITIUM *foliolis cuneiformibus furcatis.* Lin. Sp. Plant. 248. Laserwort with wedge-shaped forked lobes.

5. LASERPITIUM *foliolis lanceolatis integerrimis sessilibus.* Hort. Cliff. 96. Laserwort with spear-shaped entire leaves, fitting close to the branches.

6. LASERPITIUM *foliolis trifidis acutis.* Laserwort with acute trifid lobes.

7. LASERPITIUM *foliolis trifidis obtusis, umbellis partialibus contractis.* Laserwort with obtuse trifid leaves, and the small umbels contracted.

8. LASERPITIUM *foliolis lanceolatis integerrimis extimis coalitis.* Hort. Cliff. 96. Laserwort with entire spear-shaped lobes, whose outer ones coalesce.

9. *LASERPITIUM foliolis pinnatifidis, caule anguloso.* Laserwort with wing-pointed lobes, and an angular stalk.

There are some other varieties, if not distinct species of this plant; some of which have been put down as distinct species, which differ only in the colour of their flowers, therefore should not be regarded as such; but the number of species has been greatly lessened by some late writers, who have erred as much in lessening, as those before them had done in multiplying of the species.

These plants grow naturally in the south of France, in Italy, and Germany, and are preserved in botanick gardens for the sake of variety; but as they have no great beauty, so are seldom cultivated in other gardens; they require much room, for their roots extend far every way, and the leaves of many sorts will spread three feet, when the plants are strong; their flower-stalks rise four or five feet high, and their umbels of flowers are very large; they have all of them perennial roots but annual stalks. They flower in June, and the seeds ripen in September.

It is generally supposed, that the *Silphium* of the antients was procured from one species of this genus, but from which of them we are at present ignorant. All the species, if wounded, drop a very acrid juice, which turns to a resinous gummy substance, very acrimonious. This was externally applied by the antients to take away black and blue spots that came by bruises and blows, as also to take away excrescences; it was also by some of the antients prescribed in internal medicines, but others have cautioned people not to make use of it this way, from the effects which they mention to have seen produced from the violence of its acrimony.

All these plants are extreme hardy, so will thrive in most soils and situations; they are propagated by seed, which if sown in autumn, the plants will come up the following spring, but when they are sown in the spring, the seeds commonly remain in the ground a whole year. The plants should be transplanted the following autumn where they are designed to remain, for they send out long deep roots, which are frequently broken by transplanting, if they are large; when the plants are removed, they should be planted three feet asunder. The roots will continue many years, and require no other culture, but to clear them from weeds, and to dig between the roots every spring.

LATHYRUS. *Tourn. Inst. R. H.* 394. *tab.* 216, 217. Chichling Vetch.

The Characters are,

The flower is of the butterfly kind. The standard is heart-shaped, and reflexed at the point. The wings are oblong and blunt; the keel is half round, and the size of the wings. It hath ten stamina, nine of them joined, and one separate. It hath an oblong, narrow, compressed germer, which afterward becomes a long compressed pod, ending in a point, having two valves, filled with roundish seeds.

The Species are,

1. *LATHYRUS pedunculis unifloris, cirrhis diphyllis, leguminibus compressis dorso bimarginatis.* *Hort. Cliff.* 367. Chichling Vetch with one flower upon a foot-stalk, tendrils having two leaves, and oval compressed pods with two borders on their back part.

2. *LATHYRUS pedunculis unifloris, cirrhis diphyllis, leguminibus ovatis compressis, dorso canaliculatis.* *Lin. Sp. Plant.* 730. Cultivated Chichling Vetch with a purple flower.

3. *LATHYRUS pedunculis unifloris, cirrhis diphyllis, leguminibus teretibus.* Chichling Vetch with one flower upon a foot-stalk, a two-leaved tendril, and a taper pod.

4. *LATHYRUS pedunculis unifloris, cirrhis tetraphyllis, stipulis dentatis.* *Flor. Leyd. Prod.* 363. Chichling Vetch with one flower upon a foot-stalk, a four-leaved tendril, and indented stipulæ.

5. *LATHYRUS pedunculis unifloris, cirrhis polyphyllis, stipulis lanceolatis.* *Hort. Cliff.* 368. Chichling Vetch with one flower upon a foot-stalk, a many-leaved tendril, and spear-shaped stipulæ.

6. *LATHYRUS pedunculis bifloris, cirrhis polyphyllis, foliolis alternis.* *Hort. Cliff.* 368. Spanish Chichling Vetch with a variable flower, and jointed pod.

7. *LATHYRUS pedunculis bifloris, cirrhis diphyllis, foliolis ovato-oblongis, leguminibus hirsutis.* *Hort. Cliff.* 368. The sweet-scented Pea.

8. *LATHYRUS pedunculis bifloris, cirrhis diphyllis, foliolis lineari-lanceolatis, leguminibus hirsutis, seminibus scabris.* *Flor. Leyd. Prod.* 363. Narrow-leaved Chichling Vetch with a hairy pod.

9. *LATHYRUS pedunculis bifloris, cirrhis diphyllis, foliolis alternis lanceolatis.* *Flor. Leyd. Prod.* 363. Chichling Vetch of Tangier, with a bitter Vetch pod, and a large red flower.

10. *LATHYRUS pedunculis bifloris, cirrhis diphyllis, foliolis lineari-lanceolatis, internodiis membranaceis.* Yellow broad-leaved Chichling Vetch.

11. *LATHYRUS pedunculis multifloris, cirrhis diphyllis, foliolis ovalibus, internodiis nudis.* *Hort. Cliff.* 367. Creeping field Chichling Vetch with a tuberous root.

12. *LATHYRUS pedunculis multifloris, cirrhis diphyllis, foliolis lanceolatis, cirrhis simplicissimis.* *Hort. Cliff.* 367. Yellow wild Chichling Vetch of the woods.

13. *LATHYRUS pedunculis multifloris, cirrhis diphyllis tetraphyllisque, foliolis lanceolatis.* *It. W. Goth.* 75. Greater Chichling Vetch of Narbonne with narrow leaves.

14. *LATHYRUS pedunculis multifloris, cirrhis diphyllis foliolis lanceolato-linearibus acuminatis, internodiis membranaceis.* Greater wild Chichling Vetch with a smaller flower, and longer pointed leaves.

15. *LATHYRUS pedunculis multifloris, cirrhis diphyllis, foliolis lanceolatis, internodiis membranaceis.* *Hort. Cliff.* 367. Broad-leaved Chichling Vetch, commonly called Everlasting Pea.

16. *LATHYRUS pedunculis multifloris, cirrhis diphyllis foliolis ovato-lanceolatis, internodiis membranaceis.* Smaller broad-leaved Chichling Vetch with a larger flower; or large red flowering Everlasting Pea.

17. *LATHYRUS pedunculis multifloris, cirrhis polyphyllis, stipulis ovatis, basi acutis.* *Hort. Upsal.* 217. Chichling Vetch with many flowers on a foot-stalk, a many-leaved tendril, and oval stipulæ acute at the base.

18. *LATHYRUS pedunculis unifloris, foliis simplicibus, stipulis subulatis.* *Lin. Sp. Plant.* 729. Nissolia, or crimson Grass Vetch.

19. *LATHYRUS pedunculis unifloris calyce longioribus, cirrhis diphyllis simplicissimis.* *Lin. Sp. Plant.* 729. Chichling Vetch with single flowers upon a foot-stalk, which are longer than the empalement, and a two-leaved single tendril.

20. *LATHYRUS pedunculis bifloris, foliis reniformibus simplicissimis subtus venosis.* Chichling Vetch with two flowers upon a foot-stalk, and kidney-shaped single leaves, which are veined on their under side.

The first sort grows naturally in France, Spain, and Italy; it is an annual plant, with a climbing stalk about two feet high. The leaves come out at each joint alternate: they are composed of two long narrow lobes, with a tendril, or clasper, rising between, which fasten to any support near. The flowers come singly upon foot-stalks at each joint; they are blue, and shaped like those of the Pea; these are succeeded by oval compressed pods, with a double membrane, or wing, running longitudinally on the back. It is seldom cultivated, unless in botanick gardens for the sake of variety.

The second sort is cultivated in some countries for the seeds, which are used for feeding of poultry; this grows wild,

wild in *Italy* and *Spain*. It does not rise so high as the first sort. The leaves are longer, the pods are near twice the length of those, and are channelled on their back side; this is cultivated in the same manner as Vetches, or Tare:

The third sort was sent me from *Verona*, where it grows naturally; this is an annual plant, which seldom rises more than six or eight inches high. The two lobes of the leaves are small, and end with clasps. The flowers are of a bright scarlet, and are succeeded by taper pods, filled with roundish seeds.

The fourth sort grows naturally in *Bavaria*; this is also an annual plant. The stalk rises from two or three feet high, garnished with leaves at each joint, which are composed of four oval lobes, ending with clasps. At the base of the foot-stalk are two small appendages (called stipulæ) which are sharply indented on their edges. The flowers are small, blue, and sit close to the stalk, standing singly; these are succeeded by compressed pods an inch long, containing three or four roundish seeds.

The fifth sort grows naturally about *Paris*; this is an annual plant, with a slender stalk, about two feet high, garnished with leaves, composed of several narrow lobes placed alternate along the midrib, which ends in clasps. The flowers are blue, and come out singly upon pretty long foot-stalks.

The sixth sort grows naturally in *Spain* and *Italy*; it is an annual plant, with a climbing stalk, which rises three feet high, garnished with leaves, composed of several spear-shaped lobes, placed alternate along the midrib, which is terminated by very long clasps. The foot-stalks of the flowers are five or six inches long, upon which stand two flowers one above the other, shaped like those of the Pea. The standard, which is large, is of a bright red colour, but the keel and wings are white. The flowers are succeeded by pretty long jointed pods, filled with roundish seeds.

The seventh sort is commonly known by the title of Sweet Pea; this grows naturally in *Ceylon*, but is hardy enough to thrive in the open air in *England*. It is an annual plant with a climbing stalk, which rises from three to four feet high, garnished with leaves, composed of two large oval lobes, whose midrib is terminated by long clasps. The foot-stalks which come out at the joints, sustain two large flowers, with dark purple standards, but the keel and wings of a light blue colour. The flowers have a strong sweet odour, and are succeeded by oblong inflated pods, which are hairy, containing four or five roundish seeds in each.

There are two other varieties of this, one of which has a Pink-coloured standard with a white keel, and the wings of a pale blush colour; this is commonly called painted Lady Pea. The flowers of the other are all white, which are the only differences between them.

The eighth sort grows naturally in *Essex*. I have found it in places, which were spread over with Brambles, near *Hockereel*; this hath a perennial root, sending out three or four weak stalks, which are near two feet long, garnished with leaves composed of two oblong lobes, whose midrib is terminated by clasps. The foot-stalks sustain two purple flowers, which are succeeded by rough hairy pods, little more than one inch long, containing three or four roundish seeds.

The ninth sort was originally brought from *Tangier* to *England*; this is an annual plant, whose stalk rises four or five feet high, garnished with leaves composed of two oval veined lobes, whose midrib ends with clasps. The foot-stalks are short, and sustain two large flowers with purple standards, whose wings and keel are of a bright red; these

are succeeded by long jointed pods, containing several roundish seeds. This is sometimes titled by the gardeners Scarlet Lupine.

The tenth sort is an annual plant, which grows naturally about *Montpelier*; I have also received the seeds from *Siberia*; this rises with a climbing stalk five or six feet high, which has two membranes, or wings running along from joint to joint. The leaves are composed of two long narrow lobes, whose midrib ends with clasps. The flowers stand upon long foot-stalks, each sustaining two pale yellow flowers, which are succeeded by long taper pods, containing several roundish seeds.

The eleventh sort grows naturally amongst the Corn in the south of *France*, and in *Italy*, but is cultivated in the *Dutch* gardens for the roots, which are there sold in the markets, and are commonly eaten; this hath an irregular tuberous-root, about as big as those of the Pignut, covered with a brown skin; these shoot up several weak trailing stalks, garnished with leaves composed of two oval lobes, ending with clasps. The foot-stalks of the flowers are weak, about three inches long, each sustaining two deep red flowers, which are seldom succeeded by pods, but the roots increase plentifully in the ground. This sort will grow in most soils, but will thrive best on light ground.

The twelfth sort grows naturally in the banks and under thickets, in most parts of *England*; this hath a perennial creeping root, whereby it propagates so fast as to be a very troublesome weed, so should not be admitted into gardens.

The thirteenth sort grows naturally by the side of hedges, and in thickets, in several parts of *England*; this hath a perennial creeping root, which sends out many climbing stalks, which rise five or six feet high, garnished with leaves, which have sometimes two, and at others four long narrow lobes, terminated by clasps. The foot-stalks sustain several small flowers, with pale standards and blue wings and keels; these are succeeded by long taper pods, containing several roundish seeds.

The fourteenth sort I found growing naturally in a thicket near *Wimbleton*, in *Surry*, the seeds of which I brought to the *Chelsea* garden, where the plants have flourished many years, and continued their difference without variation. The stalks of this sort rise six or seven feet high, and have a membrane running along on each side between the joints. The leaves are composed of two narrow spear-shaped lobes, with long acute points. The foot-stalks are very long, and sustain several small Pea blossom flowers, with pale purple standards, but the keel and wings are of a deep blue colour; these are succeeded by long taper pods, like those of the former sort.

The fifteenth sort has been found growing naturally in some parts of *England*, but is frequently cultivated in gardens for ornament. It hath a perennial root, from which arise several thick climbing stalks, from six to eight feet high, which have membranaceous wings on each side, between the joints. The leaves are composed of two spear-shaped lobes, and the midrib is terminated by clasps. The foot-stalks are eight or nine inches long, and sustain several large red flowers, which are succeeded by long taper pods, containing several roundish seeds.

The sixteenth sort differs from the last in the stalks, being much shorter and stronger. The leaves are broader, and of a deeper green. The flowers are larger, and of a brighter red colour, so make a much better appearance; these differences are lasting from seeds, for I have raised many plants from seeds within thirty years past, and have always found them to be the same as the parent plant.

The seventeenth sort grows naturally in *Siberia*; this hath a perennial root and an annual stalk, which is garnished with

with leaves, composed of six or eight pair of oblong acute lobes. The flowers are blue, and many of them stand upon each foot-stalk; these are succeeded by pods, shaped like those of the Pea. It flowers in *July*, and the seeds ripen in autumn.

The eighteenth sort grows naturally in moist meadows in many parts of *England*; this rises with an upright stalk one foot high, garnished with long narrow single leaves at each joint. The foot-stalks come out from the joints toward the upper part of the stalk; they are slender, some having but one, and others have two bright red flowers on their tops.

The nineteenth sort grows naturally in *Syria*; this is an annual plant with a trailing stalk, garnished with leaves, composed of two lobes, whose midrib is terminated by a single tendril. The foot-stalk supports one flower of a pale purple colour, and when the flowers decay, the germen is thrust into the ground, where the pods are formed, and the seeds ripen.

The twentieth sort was discovered by the late *Dr. Houstoun*, growing naturally at *La Vera Cruz*; this is an annual plant with a trailing stalk a foot long, garnished with a single kidney-shaped leaf at each joint. The flowers grow two together upon very short foot-stalks; they are small, and of a deep yellow colour; these are succeeded by short taper pods, including three or four small roundish seeds.

This sort is tender, so the seeds should be sown upon a hot-bed in the spring, and when the plants are fit to remove they should be each planted into a small pot filled with light earth, and plunged into a tan-bed, where they should constantly remain, treating them in the same manner as other tender plants from warm countries; if they are brought forward in the spring, they will flower in *July*, and their seeds will ripen in autumn.

The other sorts are preserved in some curious gardens for the variety of their flowers. These may all of them be propagated by sowing their seeds either in spring or autumn, but those which are sowed in autumn should have a light soil and a warm situation, where the plants will abide the winter, and come to flower early the following spring, and their seeds will ripen in *July*; but those which are sown in the spring, should have an open exposure, and may be planted upon almost any soil, for they are not very tender plants, nor do they require much culture: these sorts should all of them be sown where they are designed to remain, for they seldom succeed when they are transplanted; so that where they are sown for ornament, there should be six or eight seeds sown in a small patch, in different parts of the borders of the flower-garden, and when the plants come up, they should be carefully kept clear from weeds; but when they are grown two or three inches high, there should be some sticks put down by them to support them, otherwise they will trail on the ground, and become unsightly; besides, they will trail on whatever plants grow near them.

LAVANDULA. *Tourn. Inst. R. H.* 198. *tab.* 93. Lavender.

The Characters are.

The flower is of the lip kind, with one petal, having a cylindrical tube spreading above; the upper lip is bifid and open, the under lip is cut into three equal segments. It hath four short stamina, two of which are shorter than the other. It hath a germen divided in four parts, which afterward turns to four oval seeds, sitting in the emplacement.

The Species are,

1. LAVANDULA *foliis lanceolatis integris, spicis nudis.* Hort. Cliff. 303. Broad-leaved Lavender.

2. LAVANDULA *foliis lanceolato-linearibus, spicis nudis.* Narrow-leaved Lavender.

3. LAVANDULA *foliis duplicato-pinnatifidis.* Vir. Cliff. 56. Cut-leaved Lavender.

4. LAVANDULA *foliis duplicato-pinnatifidis hirsutis, spicis fasciculatis.* Canary Lavender, with a longer, narrower, and more elegant cut leaf.

The first sort is cultivated in several of the *English* gardens, and has been generally known by the title of Spike, or Lavender Spike; the leaves of this sort are much shorter, and broader than those of the common Lavender; the branches are shorter, more compact, and fuller of leaves. This sort doth not often produce flowers, but when it does, the flower-stalks are garnished with leaves very different from those on the other branches, approaching nearer to those of the common sort, but are broader; the stalks grow taller, the spikes of flowers are larger, the flowers are smaller, and are in looser spikes.

The second sort is the common Lavender, which is so well known as to require no description. Both these sorts flower in *July*, at which time the spikes of the second sort are gathered for use; there is a variety of this with white flowers.

These are propagated by slips, the best season for which is in *March*; they should be planted in a shady situation, or at least shaded with mats until they have taken root; after which they may be exposed to the sun, and when they have obtained strength, may be removed to the places where they are designed to remain. These plants will abide the longest in a dry, gravelly, or stony soil, in which they will endure our severest winters; though they will grow much faster in the summer, if they are planted upon a rich, light, moist soil, but then they are generally destroyed in winter, nor are the plants half so strong scented, or fit for medicinal uses, as those which grow upon the most barren rocky soil.

The third sort grows naturally in *Andalusia*; this is an annual plant, which rises with an upright branching stalk near three feet high; the stalks are woolly, garnished with hoary leaves growing opposite, which are cut into many divisions to the midrib; these segments are again divided on their borders toward the top, into three obtuse segments, so that they end in many points. The foot-stalk of the flower is naked, having four corners or angles, and is terminated by a close spike of flowers about one inch long; the spike has the rows of flowers twisted spirally: under this spike there are commonly two small ones proceeding from the side of the stalk, at about an inch distance from the middle spike. There are two varieties of this, one with blue, and the other with white flowers.

This sort is sown every spring on borders or beds, and when the plants come up, they may be transplanted into other borders of the flower-garden, or into pots, where they are designed to flower, and will require no farther care, but to keep them clean from weeds. These are pretty plants to place in large borders, amongst other plants, for variety, but they are never used in *England*. If the seeds of this sort are permitted to scatter, the plants will come up the following spring without care, and may be treated in the manner before directed.

The fourth sort grows naturally in the *Canary Islands*. This rises with an upright branching square stalk four feet high, garnished with leaves which are longer, and cut into narrower segments than those of the third sort. They are of a lighter green, and hairy, the naked flower-stalk is also longer, and terminated with a cluster of spikes of blue flowers. The flowers are smaller than those of the common Lavender, but are of the same shape.

This sort is tenderer than either of the former, so the seeds must be sown on a moderate hot bed in the spring; and when the plants are fit to remove, they should be each planted into a separate small pot, and plunged into another hot-bed, to bring the plants forward; in the beginning of *June* they should be inured to the open air, into which

they should be placed in a sheltered situation toward the end of that month; in *July* the plants will flower, and if the autumn proves warm, the seeds will ripen in *September*; but when they do not perfect seeds in the open air, the plants may be removed into a glass case where the seeds will ripen.

LAVATERA. *Tourn. Art. Gal.* 1706. tab. 3.

The Characters are,

The flower has a double permanent empalement; the outer is of one leaf, and trifid; the inner is of one leaf, and quinquesfid. The flower hath five petals, which are joined at their base. It has many stamina, which are joined in a column below, but above are loose. It has an orbicular germen, crowned by many bristly stigmas. The empalement afterward becomes a fruit with several capsules, covered in front by a hollow shield, each capsule having one kidney-shaped seed.

The Species are,

1. LAVATERA foliis infimis cordato-orbicularis, caulinis trilobis acuminatis glabris, pedunculis unifloris, caule herbaceo. Common Lavatera with the leaf and appearance of Marsh-mallow.

2. LAVATERA foliis infimis cordato-angulatis, superne sagittatis, pedunculis unifloris, caule herbaceo hirsuto. African Lavatera with a beautiful flower.

3. LAVATERA foliis glabris, caule scabro herbaceo, pedunculis unifloris, fructibus orbiculo testis. Hort. Upsal. 203. Mallow with a variable leaf.

4. LAVATERA caule herbaceo, fructibus denudatis, calycibus incis. Hort. Upsal. 203. Lavatera with an herbaceous stalk, naked fruit, and a cut empalement.

5. LAVATERA caule arboreo, foliis septemangularibus tomentosis plicatis, pedunculis confertis unifloris axillaribus. Hort. Upsal. 202. Lavatera; or Tree Mallow, with a small flower.

6. LAVATERA caule fruticoso, foliis subcordatis subtrilobis rotundatis crenatis stipulis cordatis, pedunculis unifloris. Lin. Sp. Plant. 691. Shrubby Marshmallow with a rounder hoary leaf.

7. LAVATERA caule fruticoso, foliis quinquelobatis hastatis. Hort. Upsal. 202. Shrubby Marshmallow with an acute leaf, and a small flower.

8. LAVATERA caule fruticoso, foliis orbicularis crenatis tomentosis, pedunculis confertis unifloris axillaribus. Lavatera; or Spanish shrubby Marshmallow with a rounder leaf.

9. LAVATERA caule fruticoso, foliis quinquelobatis acutis crenatis tomentosis, racemis terminalibus. Shrubby Althæa with a Briony leaf.

The first sort grows naturally in *Syria*; it is an annual plant, with an erect, branching, herbaceous stalk, rising two or three feet high; the under leaves are orbicularly heart-shaped, smooth, and stand upon long foot-stalks, the upper are divided into three acute lobes; the flowers come out upon long foot-stalks from the wings of the leaves, they are very large, and spread open like those of the Marsh-mallow, and are of a pale red or Rose colour.

There is a variety of this with white flowers, which has accidentally risen from seeds.

The second sort grows naturally at the *Cape of Good Hope*. This differs from the first in the shape of the leaves, the lower having angles, and the upper being arrow-pointed; the stalks are hairy, the flowers larger, and of a brighter red colour.

This sort is annual, and flowers at the same time with the former, and the seeds are ripe in the autumn.

The third sort grows naturally in *Spain* and *Sicily*; this is an annual plant, which rises with slender herbaceous stalks three or four feet high, covered with a brown bark; the lower leaves are roundish, the upper are angular, and some are arrow-pointed. The flowers are not half so large

as those of either of the former, and of a pale red colour.

The fourth sort hath a perennial root: it rises four or five feet high, and is woolly, garnished with angular heart-shaped leaves, standing upon long foot-stalks. The flowers come out from the wings of the stalk toward the top, sitting close to the stalks at every joint; they are of a purplish colour, and shaped like those of the Marshmallow, but are larger. It grows naturally in *Austria* and *Bobemia*.

The fifth sort is commonly called Mallow tree; this rises with a very strong thick stalk, to the height of eight or ten feet, dividing into many branches, garnished with soft woolly leaves that are plaited, and the edges cut into several angles. The flowers are produced in clusters at the wings of the leaves, each standing upon a separate foot-stalk; they are of a purple colour, and shaped like those of the common Mallow, and are succeeded by seeds of the same form.

The sixth sort rises with a shrubby stalk seven or eight feet high, sending out several long branches, garnished with woolly leaves, differing greatly in size and shape, the lower being partly heart-shaped at their base, but divide into five roundish lobes; the upper, which are small, have three lobes which are indented on their edges. The flowers come out from the wings of the stalk, three or four at each joint, upon very short foot-stalks; they are of a light purple colour, and shaped like those of Marshmallow.

The seventh sort is a shrub which grows to the same size as the sixth, and differs from it in the shape of the leaves, which are divided into three or five acute-pointed lobes; the flowers are smaller, but of the same shape and colour. This grows naturally in the south of *France*.

The eighth sort rises with a shrubby stalk six or eight feet high, sending out many branches, garnished with roundish, crenated, woolly leaves, standing upon long foot-stalks; the foot-stalks of the flowers come out in clusters from the wings of the leaves, each sustaining one large pale blue flower, of the same shape with those of the other species.

The ninth sort rises with a shrubby stalk six or seven feet high, sending out several shrubby branches, garnished with woolly leaves, divided into five lobes, which end in acute points; the lower part of the branches are adorned with a single flower at each joint, sitting close to the stalk, but the branches are terminated by loose spikes of flowers, which are of a pale blue colour, and shaped like those of the former.

The five last mentioned sorts, though they have shrubby stalks, yet are but of short duration here, seldom continuing longer than two years, unless when they happen to grow upon dry rubbish, where they make but little progress, their stalks and branches being firmer, are better able to resist the cold; for when they are in good ground, they are very vigorous and full of sap, so are killed by the frost in common winters.

All the shrubby sorts are easily propagated by seeds, which should be sown in the spring, upon a bed of light earth; and when the plants are about three or four inches high, they should be transplanted to the places where they are designed to remain; for as they shoot out long fleshy roots which have but few fibres, so they do not succeed well if they are transplanted after they are grown large. If the seeds of these plants are permitted to scatter on the ground, the plants will come up the following spring; and when they happen to fall into dry rubbish, and are permitted to grow therein, they will be short, strong, woody, and produce a greater number of flowers than those plants which are more luxuriant. As these plants continue a long time in flower, so a few plants of each sort may be allowed a place in all gardens where there is room.

The three first sorts are annual plants: the season for sowing their seeds is in *March*, in the places where they are designed to remain, which should be in the middle of the borders in the flower-garden; for, if the soil be good, they will grow two or three feet high; when the plants are come up two inches high, they should be thinned if they are too near; after which they will require no other care but to clear them from weeds, and to fasten them to stakes, to prevent their being injured by strong winds.

The two first sorts are very ornamental plants in a garden, when placed among other annuals, either in pots or borders.

The fourth sort hath a perennial root, which abides several years, but the stalks decay in the autumn, and new ones arise in the spring. This is propagated by seeds, which should be sown upon a bed of light earth in the spring, and when the plants are fit to remove, they should be either transplanted to the places where they are to remain, or into pots where they may stand to get more strength, before they are planted in the full ground. After the plants are well rooted, they will require no other care, but to keep them clear from weeds; and if the winter should prove very severe, it will be proper to cover the ground about them with old tanners bark, to keep out the frost; but they will endure the cold of our ordinary winters very well, and will produce their flowers and ripen their seeds annually.

LAUREOLA. See *Daphne*.

LAUROCERASUS. See *Padus*.

LAURUS. *Tourn. Inst. R. H.* 597. *tab.* 367. The Bay tree.

The Characters are,

It is male and female in different plants; the male flowers have no empalement. They have nine stamina which are shorter than the petal, standing by threes, terminated by slender summits. The female flowers have no empalements; they have one petal, which is cut into six segments at the top. In the bottom is situated an oval germen. There are two globular glands, standing upon very short foot-stalks, fixed to the base of the petal. The germen afterward becomes an oval berry with one cell, inclosing one seed of the same form.

The Species are,

1. LAURUS foliis lanceolatis venosis perennantibus, floribus quadrifidis diœciis. *Hort. Cliff.* 105. The common broad-leaved Bay.

2. LAURUS foliis lanceolatis venosis perennantibus, marginibus undatis. Common Bay tree with waved leaves.

3. LAURUS foliis lineari-lanceolatis venosis perennantibus, floribus quinquefidis diœciis. Narrow-leaved Bay tree.

4. LAURUS foliis lanceolatis perennantibus venosis planis, ramulis tuberculatis cicatricibus, floribus racemosis. *Hort. Cliff.* 154. The Indian Bay.

5. LAURUS foliis lanceolatis perennantibus marginibus reflexis transversè venosis, floribus racemosis. Carolina Bay tree with pointed leaves, and blue berries sitting upon long red foot-stalks.

6. LAURUS foliis ovato-lanceolatis obtusis integris annuis. The American Benjamin tree.

7. LAURUS foliis integris trilobisque. *Hort. Cliff.* 154. The Sassafras.

8. LAURUS foliis trinerviis lanceolato-ovatis, nervis supra basin unitis. *Lin Mat. Med.* 192. The Camphire tree.

The first sort is the broad-leaved Bay, which grows naturally in *Asia*. This is not quite so hardy as the common Bay tree, though it will live in the open air in *England* through our common winters, if it is planted in a warm situation; but severe frosts will kill it, therefore many people shelter the plants in green-houses every winter.

The second is the common Bay; of this there are plants with plain leaves, and others which are waved on their edges, but they seem to be the same species, for the berries

of one have produced a mixture of both sorts; but this is undoubtedly a different species from the first and third sorts.

The third sort hath very long narrow leaves, which are not so thick as those of the two former, and are of a lighter green; the branches are covered with a purplish bark, and the male flowers come out in small clusters from the wings of the leaves, sitting close to the branches. This sort is too tender to thrive in the open air in *England*, so the plants are generally kept in pots or tubs, and housed in winter.

The fourth sort grows naturally at *Madeira* and the *Canary Islands*, from whence it was formerly brought to *Portugal*, where it has been propagated in so great plenty, as to appear now as if it was a native of that country. In the year 1620, this plant was raised in the *Farnesian* garden, from berries which were brought from *India*, and was supposed to be a bastard sort of Cinnamon. This grows to the height of thirty or forty feet in temperate countries, but it is too tender to thrive in the open air in *England*, so the plants are kept in pots or tubs, and removed into the green-house in winter.

The leaves of this sort are larger than those of the common Laurel; they are thick, smooth, and of a light green, the foot-stalks inclining to red; the branches are regularly disposed on every side, and the male flowers are disposed in long bunches; they are of a whitish green colour; the berries are much larger than those of the other sorts. It is called by some the Royal Bay, and by others the *Portugal Bay*.

The fifth sort grows naturally in *Carolina*, where it is called Red Bay; it also is found in other parts of *America*, but not in so great plenty. In some situations near the sea, this rises with a large strait-trunk to a considerable height, but in the inland parts of the country do not grow so large. The wood of this tree is much esteemed, being of a fine grain, so is of excellent use for cabinets, &c.

The leaves of this sort are much longer than those of the common Bay, and are a little woolly on their under side, their edges are a little reflexed; the veins run transversely from the midrib to the sides, and the male flowers come out in long bunches from the wings of the leaves. The female trees produce their flowers in loose bunches, standing upon pretty long foot-stalks which are red; these are succeeded by blue berries sitting in red cups.

This sort is also too tender to thrive in the open air in *England*, for although some plants have lived abroad in a mild winter, which were planted in a warm situation, yet the first sharp winter has destroyed them; so that these plants must be kept in pots or tubs, and housed in winter like the former.

These five sorts may be propagated by layers, and the common sort is generally propagated by suckers, but those plants never keep to one stem, but generally send out a great number of suckers from their roots, and form a thicket, but do not advance in height; therefore the best way to have good plants, is to raise them from the berries, for the plants which come from seeds always grow larger than the others, and do not put out suckers from their roots, so may be trained up with regular stems. The best way is to sow the berries in pots, and plunge them into a moderate hot-bed, which will bring up the plants much sooner than if they were sown in the full ground, so they will have a longer time to get strength before winter; but the plants must not be forced with heat, therefore they should be inured to bear the open air the beginning of *June*, into which they should be removed, where they may remain till autumn; then the pots should be placed under a common frame, that the plants may be protected from hard frost, but in mild weather may enjoy the free air; for while the plants are so young, they are in danger of suffering in hard frost, even the common sort of Bay. The spring following, those

plants which will not live in the open air, should be each transplanted into separate pots; but the common sort may be planted in nursery-beds six inches asunder each way, where they may grow two years, by which time they will be fit to plant where they are designed to grow. The other sorts, which require protection, should be planted in pots, and placed in a sheltered situation till autumn, when they should be placed in the green-house.

The common Bay will make a variety in all ever-green plantations, and as it will grow under the shade of other trees, where they are not too close, so it is very proper to plant in the borders of woods, where it will have a good effect in winter.

The sixth sort grows naturally in *North America*, where it rises to the height of eight or ten feet, dividing into many branches, garnished with oval spear-shaped leaves, smooth on their upper surface, but with many transverse veins on their under side; these leaves fall off in the autumn, like other deciduous trees. The flowers I have but once seen, those were all male, and of a white herbaceous colour, but if I remember right they had but six stamina in each.

The Sassafras tree is also very common in most parts of *North America*, where it spreads greatly by its creeping roots, so as to fill the ground with suckers where-ever they are permitted to grow, but in *England* this shrub is with difficulty propagated. In *America* it is only a shrub, seldom rising more than eight or ten feet high; the branches are garnished with leaves of different shapes and sizes, some of them are oval and entire, about four inches long and three broad; others are deeply divided into three lobes; these are six inches long, and as much in breadth from the extremity of the two outside lobes; they are placed alternately upon pretty long foot-stalks, and are of a lucid green; the flowers appear in the spring just below the leaves, upon slender foot-stalks, each sustaining three or four small yellow flowers, which have five oval concave petals, and eight stamina in the male flowers, which are upon different plants from the female; these have an oval germen, that afterward becomes an oval berry, which when ripe is blue.

The Camphire tree grows naturally in *Japan*, and in several parts of *India*, where it rises to a tree of middling stature, dividing into many small branches, garnished with oval spear-shaped leaves, smooth on their upper side, having three longitudinal veins which unite above the base; if these are bruised, they emit a strong odour of Camphire, as also the branches when broken. These have male and female flowers on different trees; I have only seen those of the male, which has flowered plentifully in *England*; those were small, and composed of five concave yellow petals, very like those of the Sassafras tree, which were produced by threes or fours upon each foot-stalk in like manner.

The Sassafras tree is commonly propagated by the berries, which are brought from *America*; but these berries generally lie in the ground a whole year, and sometimes two or three years before they grow, when they are sown in the spring; therefore the surest method of obtaining the plants will be, to get the berries put into a tub of earth soon after they are ripe, and sent over in the earth; and as soon as they arrive, to sow the berries on a bed of light ground, putting them two inches into the earth; and if the spring should prove dry, the bed must be frequently watered, and shaded from the great heat of the sun in the middle of the day. With this management many of the plants will come up the first season; but as a great many of the berries will lie in the ground till the next spring, so the bed should not be disturbed, but wait until the season after, to see what will come up: the first winter after the plants come up, they should be protected from the frost, especially in the autumn; for the first early frost at that season is apt to

pinch the shoots of these plants, which are tender and full of sap, and do them more injury than the severe frost of the winter; for when the extreme part of the shoots are killed, it generally affects the whole plant.

When the plants have grown a year in the seed-bed, they may be transplanted into a nursery, where they may stand one or two years to get strength, and may then be transplanted into the places where they are to remain for good.

There have been some of the plants propagated by layers, but these are commonly two, and sometimes three years before they put out roots; and if they are not duly watered in dry weather, they rarely take root; so that it is uncertain whether one in three of these layers do succeed, which makes these plants very scarce in *England* at present.

The *Benjamin* tree, as it is falsely called, may be propagated in the same manner as the Sassafras, by sowing of the berries: these generally lie long in the ground, so that unless they are brought over in earth, in the same way as before directed, they often fail, or at least remain long in the ground; but this shrub is now frequently propagated by layers in *England*, which put out roots pretty freely, when the young shoots are chosen for to make layers.

The Camphire tree is very near akin to the Cinnamon tree, from which it differs in the leaves, those of the Cinnamon tree having three ribs running longitudinally from the foot-stalk to the point, which are remarkably large; whereas the ribs of the leaves of this tree are small, and extend toward the sides, and unite before they meet the foot-stalks; the leaves have a smooth shining surface: they have male and female flowers in different trees, so that there is a necessity for both sexes to stand near each other, in order to have good seeds.

In *Europe* this tree is propagated by layers, which are two years, and sometimes longer, before they take root, so that the plants are very scarce; and as all those which I have seen flower are male trees, so there can be no hopes of procuring seeds from them here; but if the berries of this, and also of the Cinnamon tree, were procured from the places of their growth, and planted in tubs of earth, as hath been directed for the Sassafras tree, there may be a number of these plants procured in *England*: and if they were sent to the *British* colonies in *America*, they might be there cultivated, so as to become a publick advantage; especially the Cinnamon tree, which will grow as well in some of our islands in the *West-Indies*, as it doth in the native places of its growth; and in a few years the trees might be had in plenty, for they propagate easily by the berries. The *Portuguese* brought some of the Cinnamon trees from the *East-Indies*, and planted them on the island of *Princes*, on the coast of *Africa*, where they now abound, having spread over a great part of the island; there is also one of the trees growing at the *Madeiras*, and I am credibly informed there are many trees in the *Brazils*.

The Camphire tree does not require any artificial heat in winter, so that if they are placed in a dry green-house, they will thrive very well. During the winter season they must be sparingly watered, and in the summer they should be placed in a warm situation, where they may be defended from strong winds, and not too much exposed to the direct rays of the sun; and during this season, they must be frequently refreshed with water.

They may be propagated by cuttings, which should be planted in pots, and plunged into a moderate hot-bed, covering them close with a hand-glass, and shading them in the heat of the day.

LAURUS ALEXANDRIA. See Ruscus.

LAURUS TINUS. See Tinus.

LAWSONIA. *Ljn. Gen. Plant.* 443. *Henna Ludw.* 143.

The Characters are,

The flower is composed of four oval spear-shaped petals, which spread open, and eight slender stamina. It hath a roundish germen, which afterward becomes a globular capsule, ending in a point, having four cells, filled with angular seeds.

The Species are,

1. LAWSONIA ramis imermibus. Flor. Zeyl. 134. Broad-leaved Egyptian Privet, called *Albenna*, or *Henna*, by the Arabians.

2. LAWSONIA ramis spinosis. Flor. Zeyl. 135. Lawsonia with prickly branches.

The first sort grows naturally in *India*, *Egypt*, and other warm countries, where it rises with a shrubby stalk eight or ten feet high. The branches come out opposite; these are slender, covered with a whitish yellow bark, and are garnished with oblong small leaves, of a pale green, ending in acute points, placed opposite. The flowers are produced in loose bunches at the end of the branches; they are of a gray or dirty white colour, and are composed of four small petals which turn backward at the top. The flowers are succeeded by roundish capsules, with four cells, filled with angular seeds.

The leaves of this shrub are much used by the *Egyptian* women to colour their nails yellow, which they esteem an ornament.

The second sort grows naturally in both *Indies*, from whence I have received specimens of it.

This rises with a woody trunk eighteen feet high or more. The wood is hard and close, covered with a light gray bark. The branches come out alternate, and are garnished with oblong oval leaves, which stand without order; at the joints where the leaves are placed come out single, strong, sharp thorns. The flowers are produced in loose bunches from the side of the branches; they are of a pale yellow colour, and of a disagreeable scent; they have four petals, which spread open; between each of these are situated two pretty strong stamina, terminated by roundish summits. After the flowers are past, the germen becomes a roundish capsule with four cells, including many angular seeds.

These plants are both propagated by seeds, which should be sown on a hot-bed early in the spring, that the plants may have time to get strength before winter. When the plants are fit to remove, they should be each planted in a small pot, and plunged into a hot-bed of tanners bark, where they must be screened from the sun till they have taken new root, then their treatment should be the same as that of the *Coffee* tree, with this difference only, not to keep it too warm, nor give them so much water, but especially in the winter, during which season it should be given to them very sparingly, for by over watering these plants I have known many of them destroyed; these plants are too tender to thrive in the open air in *England*, so they must be placed in a moderate stove in autumn, but in the warmest part of summer they may be put in the open air in a sheltered situation.

LAYERS. Many trees may be propagated by layers, which do not produce seeds here, so are not easily increased by any other method, and a great number of plants are this way increased.

Laying of Trees.

The young branches of the former year's shoots of trees should be chosen to make layers, because these are generally more inclined to put out roots than the older wood. When these are produced near the ground, they may with greater facility be layed. These shoots should be divested of their side branches, if they have any; and those sorts of trees which put out roots with difficulty, should have a slit made upward at a joint, in that part which is to lie in the ground; or a piece of wire twisted close round the branch

at the same place, which will check the mounting sap, and cause them to put out roots; the ground should be well dug, and the clods broken; then the shoots should be layed five or six inches under the surface, driving down a peg to each to prevent their rising, leaving the end of the shoots five or six inches above ground in an erect position.

The season for laying hardy trees, that shed their leaves, is in *October*, but for such as are tender in *March*; but for ever-greens, *July* or *August* are good seasons.

However, the summer is the best time for small plants, because such plants being but short lived draw root the quicker.

If you would lay young trees from a high standard, the boughs of which cannot be bent down to the ground, then you must make use of Osier baskets, boxes, or pots, filled with fine sifted mould, mixed with a little rotten Willow dust, which will keep moisture to assist the layer in taking root; this basket, box, &c. must be set upon a post, or tressel, &c. and the bough must be laid according to the former way of laying, covering the surface with moss to prevent the earth from drying.

The harder the wood of the tree is, the younger should be the shoots, for such will take root best; but if the wood be soft, the older boughs will take root the best, and are less liable to rot.

There are many kinds of trees and plants which will not put out roots from their woody branches, though laid down with the utmost care, yet if the young shoots of the same year are laid in *July*, they will often put out roots very freely, so that when any plants are found difficult to propagate by layers in the common way, they should be tried at this season; but as these shoots will be soft and herbaceous, they must not have too much wet, for that will cause them to rot, therefore it will be a better method to cover the surface of the ground over the layers with moss, which will prevent the ground from drying too fast, so that a little water now and then will be sufficient.

LEAVES. A leaf is defined to be a part of a plant extended into length and breadth, in such a manner as to have one side distinguishable from the other; they are properly the most extreme part of a branch, and the ornament of the twigs, and consist of a very glutinous matter, being furnished every where with veins and nerves; one of their offices is, to subtilize and give more spirit to the abundance of nourishing sap, and to convey it to the little buds.

If the surface of leaves are altered, by reversing the branches of trees on which they grow, the plants are stopped in their growth, until the foot-stalks are turned, and the leaves recover their former position. This shews how necessary it is to support all those weak shoots of plants, which are naturally disposed for upright growth, which either twine about the neighbouring trees for support, or that put out claspers, by which they take hold of whatever trees or plants grow near them, and are thereby supported; and, on the contrary, how absurd is that practice of tying up the shoots of those plants which are naturally disposed to trail upon the ground, for in both these cases nature is reversed, and consequently the growth of both sorts of plants is greatly retarded.

This is one of the great functions for which the leaves of trees and plants are designed; but, besides this, there are others of equal importance to the well-being of plants and fruits; the first is that of the foot-stalks and leaves nourishing and preparing the buds of the future shoots, which are always formed at the base of these foot-stalks, and during the continuance of the leaves in perfect health, these buds increase in their magnitude, and, in the deciduous trees, are brought to maturity before the foot-stalks separate from the buds in autumn; but if by accident the leaves are blighted,

blighted, or if the entire surface of the leaves are cut off, and the foot-stalks are left remaining, the buds will decay for want of that proper nourishment which is conveyed to them from the leaves; so that whenever trees are divested of their leaves, or those leaves are cut, or otherwise impaired, though it may in either case happen when the buds may be nearly formed, yet if it is before the foot-stalks separate naturally from the branches, the future shoots will be weakened in proportion to the time when this is done; therefore from all the experiments which have been made in order to know how serviceable the leaves of trees and plants are to their well-being, it has been found, that where the plants have been divested of their leaves, or their leaves have been eaten or cut, during their growth, the plants have been remarkably weakened thereby. This should teach us not to pull, or cut off the leaves of trees, or plants, on any account, while they retain their verdure, and are in health; and this shews how absurd that common practice is; of feeding down Wheat in the winter and spring with sheep; for by so doing, the stalks are rendered very weak, and the ears are in proportion shorter, nor are the grains of Corn so plump and well nourished, as that which is not fed down upon the same ground; this is a fact which I can assert from many years experience. It is very evident, that Grass which is often mowed, the blades will be rendered finer in proportion to the frequency of mowing it, yet the species of Grass is the same with that on the richest pastures; so that although this may be a desirable thing for lawns, &c. in gardens, yet where regard is had to the produce, this should be avoided.

Another principal use of the leaves is to throw off by transpiration, what is unnecessary for the growth of the plants, answering to the discharge made by sweat in animal bodies; for as plants receive and transpire much more, in equal time, than large animals, so it appears how necessary the leaves are to preserve the plants in perfect health; for it has been found by the most exact calculations, made from repeated experiments, that a plant of the Sun flower receives and perspires, in twenty-four hours, seventeen times more than a man.

I shall beg leave to mention a few, out of the many experiments which have been made by *Monf. Bonnet*, of *Geneva*, to prove that most leaves imbibe the moisture of the air on their under surface, and not from their upper; they are as follow:

He gathered the leaves of sixteen sorts of herbaceous plants when fully grown; of each he put several leaves upon the surface of water in glass vases, some were posited with their upper surface, and others with their under surface upon the water; these were adjusted exactly to the surface of the water, with great care not to let any moisture reach their opposite surfaces, and the same care was taken to prevent their foot-stalks from receiving any moisture. The glasses in which these leaves were thus placed, were kept in a closet, where the air was very temperate; and as the water in the glasses evaporated, there was from time to time a supply of fresh, which was added with a syringe, so that the leaves were not disturbed. The leaves were taken from the following plants; the Plantain, the Mullein, the Wake Robin, the great Mallow, the Nettle, the Marvel of *Peru*, the Kidney-bean, the Sun-flower, the Cabbage, the Balm, the Cockscorn, the purple-leaved Amaranth, Spinach, and the smaller Mallow.

Six of these sorts he found continued green a long time, and these were with different surfaces upon the water; they were of the following sorts, the Wake Robin, the Kidney-bean, the Sun-flower, the Cabbage, the Spinach, and small Mallow; among the others the following sorts were found to draw the moisture better with their upper surface than

their under, the Plantain, the Mullein, the great Mallow, the Nettle, the Cockscorn, and the purple Amaranth.

The leaves of the Nettle, whose under surface was upon the water, were decayed in three weeks, whereas those whose upper surface was next the water continued two months.

The leaves of Mullein, whose under surface was next the water, did not continue fresh more than five or six days, but those whose upper surface was next the water lasted five weeks.

The leaves of the purple Amaranth, whose upper surface was next the water, continued fresh three months, whereas those whose under surface was next the water were decayed in a week.

The leaves of the Marvel of *Peru* and the Balm, appeared to have the advantage, whose under surfaces were next the water.

The leaves of Wake Robin and of the Cockscorn, whose foot-stalks only were put into the water, continued fresh a longer time, than those which were placed with either surface next the water.

The leaves of the great Mallow, the Nettle, the Sun-flower, the Marvel of *Peru*, and Spinach, whose foot-stalks were plunged into the water, continued fresh a shorter time, than those which had either of their surfaces next the water.

The leaves of the Mullein, of Plantain, and Amaranth, which received the water at their foot-stalk, continued fresh much longer than those whose under surfaces was next the water.

It is not difficult to explain the reason of this fact, for the orifices of the sap-vessels in the foot-stalk, are much larger than those of either surface, so that the moisture insinuates in greater quantities and with more ease, the first than by the second way.

After this the same gentleman made experiments on the leaves of sixteen sorts of trees and shrubs of the following sorts, the Lilac, the Pear tree, the Vine, the Aspen, the Laurel, the Cherry tree, the Plum tree, the Horse Chestnut, the White Mulberry, the Lime tree, the Poplar, the Apricot, the Walnut, the Filbert, the Oak, and the Creeper.

Among these species he found that the Lilac and the Aspen imbibed the moisture on their upper surface, equally with the under surface; but in all the other sorts, the under surface imbibed it in much greater quantities than the opposite. The difference was very remarkable in the leaves of the White Mulberry, for those whose upper surface was laid upon the water, faded in five days, whereas the other, whose under surface was next the water, preserved their verdure near six months.

The Vine, the Poplar, and Walnut tree, are very remarkable instances, how little disposed the upper surfaces of the leaves of ligneous plants are to imbibe the moisture; for those of these three sorts, whose upper surfaces were applied to the water, decayed almost as soon as those which had no nourishment.

In all the experiments made by this curious gentleman upon the various leaves of trees and herbs, it is remarkable, that all those leaves, which imbibed their moisture by their upper surface, were such as had that surface covered either with hairs or down; and on the contrary, where the under surface was garnished with either hairs or down, the moisture was imbibed by that surface. He likewise mentions many experiments made by himself, and also by *Monf. du Hamel de Monceau*, of the Royal Academy of Sciences at *Paris*, in rubbing the leaves over with varnish, oil, wax, and honey, to see the effect of these upon various leaves, some of which were rubbed over on both surfaces, others only upon one; some only a part of the surface, others the edges of the leaves

leaves were rubbed over, and in some only the foot-stalks of the leaves were rubbed with these. They likewise anointed the trunks of some trees and shrubs, and left the leaves and branches in their natural state.

The result of these experiments was, that where the leaves were anointed on both surfaces with varnish, they decayed presently; and where they were anointed with the other things, in proportion as those were most penetrating, so the leaves continued a shorter time than the others; and where one surface only was anointed, they continued much longer than those which were anointed on both; and where the pedicle only was anointed, they continued still longer; but the anointing of the trunks made no sensible alteration, excepting in very hot weather; when they both imagine, that the anointing them was of service, by hindering the too great transpiration which might weaken the trees; for they observed, that those trees which were varnished, suffered less from the violent heat, than the trees which were left in their natural state.

Mons. Bonnet also observed, that those leaves which were varnished, that the tender parts of the leaves were destroyed by it, and the tough fibres only were left remaining.

We may therefore reasonably conclude, that one great use of leaves is what has been long suspected by many, viz. to perform, in some measure, the same office for the support of the vegetable life, as the lungs of animals do for the support of animal life; plants, very probably, drawing through their leaves some part of their nourishment from the air.

LEDUM. *Lin. Gen. Plant.* 483. Marsh Cistus, or wild Rosemary.

The Characters are,

The empalement of the flower is indented in five parts. It hath five oval concave petals, and ten slender stamina, and a roundish germen, which afterward becomes a capsule with five cells, opening at the base in five parts, filled with small, narrow, acute-pointed seeds.

We have but one Species of this genus, viz.

LEDUM *foliis linearibus subtus hirsutis, floribus corymbosis. Flor. Suec.* 341. Ledum with very narrow leaves, hairy on their under side, and flowers growing in a corymbus.

This plant grows naturally upon mosses and bogs in many parts of *Yorkshire*, *Cheshire*, and *Lancashire*, where it rises with a slender shrubby stalk about two feet high, dividing into many slender branches, garnished with narrow leaves not much unlike those of Heath. The flowers are produced in small clusters at the end of the branches, which are shaped like those of the Strawberry tree, but spread open wider at the top. These are of a reddish colour, and in the natural places of their growth are succeeded by seed-vessels filled with small seeds, which ripen in autumn.

It is with great difficulty this plant is kept in a garden, for as it naturally grows upon bogs, so unless the plants have some such soil and a shady situation, they will not thrive. The plants must be procured from the places of their growth, and taken up with good roots, otherwise they will not live.

LEEK. See Porrum.

LEMON TREE. See Limon.

LENS. See Ervum.

LENS PALUSTRIS, Duck Meat. This is a very common plant, growing upon standing waters in most parts of *England*; where, if it is not disturbed, it will soon cover the whole surface.

LENTISCUS. See Pistacia.

LEONTICE. *Lin. Gen. Plant.* 381. Lion's Leaf.

The Characters are,

The flower has six acute petals, and six nectariums which are fixed by small foot-stalks to the base of the petals. It has six

stamina. In the center is placed an oval germen, which afterward becomes a globular, swollen, succulent berry, with one cell, inclosing two or three globular seeds.

The Species are,

1. LEONTICE *foliis pinnatis, petiolo communi simplici. Hort. Cliff.* 122. Lion's Leaf, with winged leaves having one common single foot-stalk.

2. LEONTICE *foliis decompositis, petiolo communi trifido. Hort. Cliff.* 122. Lion's Leaf with decomposed leaves, and a common trifid foot-stalk.

These plants both grow naturally in the islands of the *Archipelago*, and also in the Corn-fields about *Aleppo*, where they flower soon after *Christmas*. They have large tuberous roots, about the size of those of *Cyclamen*, covered with a dark brown bark; the leaves arise upon slender foot-stalks immediately from their roots, which grow about six inches high; that of the first sort is single, having many small *folioli* ranged along the midrib, but the foot-stalks of the second sort are branched into three smaller; upon each of these are ranged several *folioli* or small leaves, in the same form as the winged leaves. The flowers set upon naked foot-stalks; those of the first sort sustain many yellow flowers, but the flowers of the second are smaller, and of a paler colour. These in their native country appear soon after *Christmas*, but in *England* they do not flower till the beginning of *April*, and are never succeeded by seeds here.

Both these plants are propagated by seeds, which require to be sown soon after they are ripe, otherwise they seldom succeed; but as they are brought from distant countries, they should be preserved in sand to be sent to *England*. I received a few of these seeds from the duke *D'Ayen*, which were sent him from *Aleppo* put up in sand, and these came up better than any of those which came over dry; for of several parcels of these seeds which I have sown of both kinds, I have not had more than two plants arise.

The plants are very difficult to preserve in *England*, for the roots will not thrive in pots; and when they are planted in the full ground, the frost frequently destroys them in winter, especially while the roots are young. Of late years the winters have proved so very unfavourable, as to kill all the young roots which I had raised in the *Chelsea* garden; but before the severe winter in 1740, I had some of the roots which were planted in a south-west-border, that flowered several years, and without any shelter survived the winters; but although I covered many of those roots which I had lately raised, yet I could not preserve them.

The leaves of these plants decay about *Midsummer*, and the roots remain in an unactive state till the following spring, at which time the flowers and leaves come up nearly at the same time.

LEONTODON. *Lin. Gen. Plant.* 817. Dandelion.

There are four or five species of this genus, which grow naturally in the fields, so are not cultivated in gardens; but some people in the spring gather the roots out of the fields, and blanch them in their gardens for a Sallad herb; however, as they are not cultivated, I shall forbear saying any thing more of them, than that they are very bad weeds both in gardens and fields, so should be rooted out before their seeds are ripe, otherwise they will spread to a great distance, as they have down adhering to them, by which they are waisted about by the wind.

LEONTOPODIUM. See Plantago.

LEONURUS. *Tourn. Inst. R. H.* 187. tab. 87. Lion's Tail.

The Characters are,

The flowers have one petal of the lip kind; the upper lip is cylindrical, hairy, and entire; the lower lip is reflexed, and cut into three parts. It hath four stamina, two of which are shorter than the other. In the bottom of the tube are situated four germen,

men, which after-ward become four oblong angular seeds, sitting in the empalement.

The Species are,

1. *LEONURUS foliis lanceolatis, obtusè ferratis.* Hort. Cliff. 312. Lion's Tail with spear-shaped leaves, which are bluntly sawed.

2. *LEONURUS foliis ovatis, calycibus decagonis, septem dentatis, inæqualibus.* Hort. Cliff. 312. Lion's Tail with oval leaves, an empalement having ten corners, and seven unequal indentures.

The first sort is a native of *Ethiopia*. This rises with a shrubby stalk seven or eight feet high, sending out several four-cornered branches, garnished with oblong narrow leaves, acutely indented on their edges, hairy on their upper side, and veined on their under, standing opposite. The flowers are produced in whorls, each of the branches having two or three of these whorls toward their ends; they are of the lip kind, shaped somewhat like those of the dead Nettle, but are much longer and covered with short hairs; they are of a golden scarlet colour, so make a fine appearance. The flowers commonly appear in *October* and *November*, and sometimes continue till the middle of *December*, but are not succeeded by seeds here.

There is a variety of this with variegated leaves, which is by some admired; but as this seldom produces so large whorls of flowers as the plain sort, is not generally esteemed.

The second sort is a native of the *Cape of Good Hope*, from whence I have two or three times received the seeds.

This rises with a square shrubby stalk about three feet high, sending out several four-cornered branches, garnished with oval crenated leaves, rough on their upper side like the dead Nettle, but veined on the under, placed opposite. The flowers come out in whorls round the branches, in like manner as the former, but are not so long nor so deep coloured; they appear at the same season with the first, and continue as long in beauty.

Both these sorts are propagated by cuttings. If the cuttings are planted the beginning of *July*, after the plants have been exposed to the open air long enough to harden the shoots, they will take root very freely. They should be planted in a loamy border to an east aspect, and if they are covered closely with a bell or hand-glass to exclude the air, and shaded from the sun, it will forward their putting out roots; but when they begin to shoot, the glasses should be raised to admit the free air, to prevent their drawing up weak, and by degrees they must be exposed to the open air. As soon as they have taken good root, they must be taken up, and each planted in a separate pot filled with soft loamy earth, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till *October*, when they must be removed into the green-house, and after-ward treated as the Myrtle, and other hardy green-house plants, observing to water the first sort plentifully.

LEPIDIUM. Tourn. Inst. R. H. 215. tab. 133. Dittander, or Pepperwort.

The Characters are,

The flower has four oval petals placed in form of a cross, and six awl-shaped stamina, two of which are shorter than the other. In the center is situated a heart-shaped germen, which after-ward turns to a spear-shaped seed-vessel with two cells, divided by an intermediate partition, containing oblong seeds.

The Species are,

1. *LEPIDIUM foliis ovato-lanceolatis integris serratis.* Hort. Cliff. 330. Broad-leaved or common Dittander.

2. *LEPIDIUM foliis lanceolatis amplexicaulibus dentatis.* Hort. Cliff. 331. Dittander with spear-shaped indented leaves, which embrace the stalks.

3. *LEPIDIUM foliis lineari-lanceolatis subdentatis amplexicaulibus radice reptatrice.* Low Dittander of *Aleppo* with less hoary leaves.

4. *LEPIDIUM floribus diandris tetrapetalis, foliis inferioribus lanceolatis serratis, superioribus linearibus integerrimis.* Flor. Leyd. Prod. 334. Dittander with flowers having four petals and two stamina, whose under leaves are spear-shaped and sawed, and the upper narrow and entire.

5. *LEPIDIUM foliis caulinis pinnato-multifidis, ramiferis cordatis, amplexicaulibus integris.* Hort. Cliff. 331. The true Mithridate Mustard of *Dioscorides*.

6. *LEPIDIUM floribus subtriandris tetrapetalis, foliis linearibus pinnatis.* Lin. Gen. Plant. 645. Dittander with flowers having four petals, and sometimes three stamina, and very narrow winged leaves.

7. *LEPIDIUM foliis lyratis crispis.* Lin. Sp. Plant. 644. Dittander with curled lyre-shaped leaves.

The first sort grows naturally in moist places in many parts of *England*, so is seldom cultivated in gardens. It hath small white creeping roots, by which it multiplies very fast, so as to render it difficult to eradicate, after it has grown long in any place; the lower leaves are oval, spear-shaped, sawed on the edges, standing upon long foot-stalks. The stalks are smooth, rise two feet high, and send out many side branches; the leaves upon the stalks are longer, narrower, and more acute-pointed than the lower. The flowers grow in close bunches toward the top of the branches, coming out from the side; they are small, and composed of four small white petals. The seeds ripen in the autumn. The whole plant has a hot biting taste like Pepper, and the leaves have been often used by the country people to give a relish to their viands instead of Pepper; from whence it had the appellation, of poor Man's Pepper.

This plant is easily propagated, for every piece of the root will grow and multiply where-ever it is planted, so will become troublesome to root out after growing for some time in a garden.

The second sort grows naturally in *Austria* and *Italy*; this hath a fleshy fibrous root, from which arise several weak stalks about a foot and a half high, garnished with spear-shaped hoary leaves, deeply cut in upon the edges, which embrace the stalks with their base; the flowers are small, white, and grow in loose bunches at the end of the branches.

This is a perennial plant, which propagates very fast by its roots, and is seldom admitted into gardens.

The third sort grows naturally about *Aleppo*; this hath creeping roots, which extend to a great distance, so will soon spread over a large piece of ground. The leaves of this are longer and narrower than those of the former, and are less hoary; the flowers grow in loose bunches at the end of the branches; they are small, white, and like those of the first. This is a hardy perennial plant, which propagates by its creeping roots in as great plenty as either of the former.

The fourth sort grows naturally in the south of *France*, *Italy*, and *Sicily*. This hath a long fleshy root, which runs deep into the ground, sending out many oblong sawed leaves, which spread on the ground; the stalks are slender, stiff, and rise about two feet high, garnished with very narrow entire leaves. The flowers come out in close clusters at the end of the branches, they are white, and appear in *June* and *July*, and the seeds ripen in autumn. If these seeds are permitted to scatter, the plants will come up early in the spring, and require no other care but to keep them clean from weeds; the roots will abide several years if they are in a dry soil.

The fifth sort grows naturally in *Persia* and *Syria*; this is supposed to be the true Mithridate Mustard of *Dioscorides*. It is an annual plant, whose lower leaves are finely cut into many winged segments; the stalks rise a foot high, dividing at the top into slender branches, garnished with heart-shaped intire leaves, which embrace the stalks with their

their base. The flowers grow in long loose spikes from the end of the branches; they are small, yellow, and appear in *June* and *July*; the seeds ripen in *September*, soon after which the plant decays.

The seeds of this plant should be sown in the autumn, for those which are sown in the spring, seldom flower the same year, and are often killed by the frost in winter; whereas those which are sown in the autumn, or the plants that rise from scattered seeds, will always flower about *Midsummer*, and their seeds ripen the *September* following. The plants require no other care but to thin them to a proper distance, and keep them clean from weeds.

The sixth sort is an annual plant, which grows naturally in *Virginia*, and in most of the islands of the *West-Indies*, where the inhabitants gather the leaves, and eat them in their Sallads as we do the garden Cress.

The lower leaves of this sort are long and sawed on their edges, of a light green, with a biting taste like Cress. The stalk rises a foot and a half high, sending out a great number of small side branches, garnished with narrow leaves regularly sawed on their edges, so as to resemble winged leaves; these sit close to the branches. The flowers are produced at the end of the branches in loose spikes, they are small, white, and are succeeded by roundish or heart-shaped compressed seed-vessels, which have a border round them. This sort is easily propagated by seeds, which may be sown upon an open bed in *April*, where the plants are designed to remain, and when they come up, they will require no other care, but to thin them where they are too close, and keep them constantly clean from weeds; or if the seeds are permitted to scatter in the autumn, the plants will come up very well, and may be treated in the same way as the other.

The seventh sort grows naturally in *Asia*. This is a biennial plant, the lower leaves which spread on the ground, are indented on both sides, and are in shape of a lyre; the stalks rise a foot high, and divide into a great number of slender branches, garnished with small oblong leaves, which are cut, and a little curled on their edges; the stalks and leaves are of a gray colour, inclining toward hoariness. The flowers are produced in clusters at the end of the branches; they are white, and are succeeded by roundish bordered seed-vessels which are compressed, and have two cells each, containing two small oblong seeds, which are ripe in the autumn.

This sort may be propagated by seeds, in the same manner as the former; or if the seeds are permitted to scatter in the autumn, the plants will come up without care, and should be treated in the same way as the former sort; but this does not flower till the second year, so the plants should be left farther asunder.

LEPIDOCARPODENDRON. See Protea.

LETTUCE. See Lactuca.

LEUCANTHEMUM. See Anthemis.

LEUCOJUM. *Lin. Gen. Plant.* 363. Snowdrop.

The Characters are,

It hath an obtuse compressed spathe. The flower is of the spreading bell-shape, cut into six parts. It hath six short bristly stamina. The roundish germen is situated under the flower, which afterward becomes a turbinated capsule with three cells, opening with three valves, filled with roundish seeds.

The Species are,

1. LEUCOJUM *spathâ uniflorâ, stylo clavato. Lin. Sp. Plant.* 289. Early great Snowdrop.

2. LEUCOJUM *spathâ multiflorâ, stylo filiformi. Læf. Lin. Sp. Plant.* 289. Snowdrop with many flowers in a sheath, and a thread-like style.

The first sort grows naturally in *Switzerland* and *Germany*, as also upon the mountains near *Turin*. This hath

an oblong bulbous root, shaped like that of the Daffodil, but smaller; the leaves are flat, of a deep green, four or five in number, considerably broader than those of the small Snowdrop; between these arise an angular stalk near a foot high, which is naked, hollow, and channelled; toward the top comes out a sheath which is whitish, opening on the side, out of which come one, or sometimes two white flowers, hanging upon slender foot-stalks; these have but one petal, which is cut into six parts almost to the bottom. They are much larger than those of the small Snowdrop, and the ends of the segments of the petal are tipped with green, where they are of a thicker substance than in any other part. These flowers appear in *March*, soon after those of the small sort; they have an agreeable scent, not much unlike that of the flowers of Hawthorn; after the flower is past, the germen which is situated below the flower, swells to a Pear-shaped capsule with three cells, inclosing several oblong seeds.

The leaves of this sort decay toward the end of *May*, after which time the roots may be taken up and transplanted, for they should not be long kept out of the ground. It is propagated here by offsets, which the roots put out pretty plentifully when they are in a situation agreeable for them, and are not too often removed. They should have a soft, gentle, loamy soil, and an exposure to the east; the roots should be planted six inches asunder, and four or five inches deep, and must not be transplanted oftener than every third year.

The second sort is generally known by the title of late, or tall Snowdrop; this grows naturally in the meadows near *Pisa* in *Italy*, in *Hungary*, and also near *Montpelier*.

The root of this sort is near as large as that of the common Daffodil, and is very like it in shape; the leaves are also not unlike those of the Daffodil, and are more in number than those of the other sort; they are green, and keel-shaped at the bottom, where they fold over each other, and embrace the stalk, which rises a foot and a half high, and at the top is situated a spathe (or sheath) which opens on one side, and lets out three or four flowers, which hang downward, upon pretty long foot-stalks; these are cut into six oval concave segments almost to the bottom, and are of a clear white, with a large green tip to each segment, which is of a thicker consistence than any other part of the petal; within are situated six awl-shaped stamina, with oblong yellow summits, standing erect round a very slender style, crowned by an obtuse stigma. These flowers appear the latter end of *April* or beginning of *May*, and are succeeded by large triangular seed-vessels, having three cells, each containing two rows of seeds.

This sort is generally propagated in *England* by offsets, for the plants raised by seeds will not come to flower in less than four years; and as the roots put out offsets in plenty, so that is the more expeditious method. These roots may be treated in the same way as the first sort, and should have a soft loamy soil, and be exposed only to the morning sun, where they will flower stronger and continue longer in beauty, than when they are in an open situation, though they will thrive almost in any soil.

LEUCOJUM INCANUM. } See Cheiranthus.

LEUCOJUM LUTEUM. }

LEUCOJUM BULBOSUM. See Galanthus.

LICHEN, Liverwort.

There being two sorts of this plant, which are sometimes used in medicine, and one of those being accounted a sovereign remedy for the bite of mad dogs, I thought it would not be improper to mention them here, though they are plants which cannot be propagated by any method, except by paring up the turf of Grass whereon they grow, and laying it down in some moist shady place, where, if the turf takes root and thrives, these plants will spread and do well.

The two Sorts are,

1. LICHEN *petraeus latifolius*, five *hepatica fontana*. C. B. P. Common broad-leaved Liverwort.
2. LICHEN *terrestris cinereus*. Raii Syn. Ash-coloured ground Liverwort.

The first sort grows on the sides of wells, and in moist shady places, not only on the ground, but on stones, bricks, or wood. Of this there are several varieties, which are distinguished by the curious in botany; but as most of them are plants of no use, I shall not enumerate them.

The second sort (which is used to cure the bite of mad dogs) grows on commons, and open heaths, where the Grass is short, in most parts of England, especially on declivities, and on the sides of pits. This spreads on the surface of the ground, and, when in perfection, is of an Ash colour, but as it grows old, it alters, and becomes of a dark colour. This is often carried into gardens with the turf which is laid for walks and slopes, and where the soil is moist and cool, it will spread, and be difficult to destroy, so that it renders the Grass unsightly; but this is the only method yet known to have it grow in gardens, where it is desired.

This is esteemed a sovereign remedy for the bite of mad dogs, and hath been for many years used with great success.

It was communicated to the Royal Society by Mr. *George Dampier*, whose uncle had long used this plant, to cure the bite of mad dogs, on men and animals, with infallible success. The method of taking it he has delivered as followeth: "Take of the herb, and dry it either in an oven, by the fire, or in the sun; then powder it, and pass it through a fine sieve; mix this with an equal quantity of powdered Pepper. The common dose of this mixture is four scruples, which may be taken in warm milk, beer, ale, or broth." He also advises, that the part bitten be well washed, as also the clothes of the person who is bit, lest any of the snivel, or drivel, of the mad dog should remain. If the person bitten be full grown, he advises, that he be blooded before the medicine is taken, and to use the remedy as soon after the bite as possible, as also to repeat the dose two or three several mornings fasting.

LIGUSTICUM. *Tourn. Inst. R. H. 323. tab. 171.*

The Characters are,

It hath an umbellated flower. The general umbel is composed of several smaller. The general umbel has an involucre of seven unequal leaves. The flower hath five equal petals, which are inflexed at their points. It hath five hairy stamens. The germen, which is situated under the flower, afterward turns to an oblong fruit, divided into two parts, which is angular and channelled, containing two oblong smooth seeds.

The Species are,

1. LIGUSTICUM *foliis multiplicibus, foliolis supernè incisis*. Hort. Cliff. 97. Common Lovage.
2. LIGUSTICUM *foliis biternatis*. Lin. Sp. Plant. 250. Scotch Lovage with a Small leaf.
3. LIGUSTICUM *foliis bipinnatis, foliolis confluentibus incisis integerrimis*. Lovage with double winged leaves, whose lobes run together, and have entire segments.
4. LIGUSTICUM *foliis pinnatifidis, foliolis linearibus planis*. Lovage of the Pyrenees, with a shining Fennel leaf.
5. LIGUSTICUM *foliis multiplicato pinnatis, foliolis pinnatim incisis*. Lin. Syst. 258. Broad leaved, stinking, bastard Hemlock.

The first sort is the common Lovage of the shops, which was formerly cultivated in the kitchen-gardens as an esculent herb, but has been long disused as such in England. It grows naturally upon the *Appennines*, and also near the river *Liguria*, not far from *Genoa*. It hath a strong perennial root, composed of many strong fleshy fibres, covered with a brown skin, of a strong aromattick smell and taste. The leaves are large, winged, and composed of many large lobes shaped like those of Smallage, but of a deeper green.

The lobes toward the top are cut into acute segments. The stalks rise to the height of six or seven feet; they are large, channelled, and divide into several branches, each being terminated by a large umbel of yellow flowers, which are succeeded by oblong striated seeds.

This is easily propagated by seeds, which should be sown in autumn soon after they are ripe, for when they are kept out of the ground till spring, they seldom grow the first year; when the plants come up, they may be transplanted into a moist rich border, at about three feet distance from each other, and after they have taken new root, they will require no other care but to keep them clean from weeds. The roots will abide many years, and where the seeds are permitted to scatter, the plants will come up without care.

The second sort grows naturally near the sea in many parts of *Scotland*; this hath a perennial root, but of much less size than the former; the leaves are composed of broader and shorter lobes, each leaf having two or three trifoliate leaves, whose lobes are indented on their edges. The stalk rises about a foot high, sustaining a small umbel of yellow flowers on the top, shaped like those of the former; these are succeeded by oblong channelled seeds, which ripen in autumn. This plant may be cultivated in the same manner as the former.

The third sort grows naturally on the *Alps*; this is a perennial plant. The stalks rise about two feet high, and at every joint are bent alternate, first to one side, then to the opposite; at each joint they are garnished with doubly winged leaves, composed of small lobes, which run into each other, and just above each leaf comes out a side branch; these, as also the principal stalks, are terminated by umbels of white flowers, which are succeeded by oblong channelled seeds, which ripen in autumn.

The fourth sort grows naturally on the *Pyrenean* mountains; this hath a biennial root. The leaves are doubly winged. The lobes are very narrow, and finely divided. The stalks are strong, and rise a foot and a half high, garnished with shining winged leaves, and are terminated by pretty large umbels of yellowish flowers.

The fifth sort grows naturally on the *Peloponnesian* mountains; this hath a very thick fleshy root, like that of Parsnep. The leaves are large, composed of many winged leaves, whose lobes are cut into acute points; these are of a deep green, and, when bruised, emit a foetid odour. The stalks rise four or five feet high; they are very large and hollow, like those of Hemlock, and sustain at their top large umbels of yellowish flowers, in shape of a corymbus; these are succeeded by oblong channelled seeds, which ripen in autumn.

This has by some persons been thought to be the Hemlock of the ancients, their conjectures being founded upon the plant, answering in many particulars the description of *Cicuta*, and also from the poisonous quality of it, together with its foetid scent; and as this grows naturally in many parts of *Asia*, so they have been induced to believe it might be the same plant.

LIGUSTRUM. *Tourn. Inst. R. H. 596. tab. 367. Privet.*

The Characters are.

The flower hath one funnel-shaped petal, cut into four oval segments at the top, which spread open. It hath two stamens which stand opposite, and a roundish germen, which afterward turns to a smooth round berry with one cell, inclosing two oblong seeds, flat on one side, but convex on the other.

The Species are,

1. LIGUSTRUM *foliis lanceolato-ovatis obtusis*. The common Privet.
2. LIGUSTRUM *foliis lanceolatis acutis*. Privet with spear-shaped leaves; commonly called the *Italian* ever-green Privet.
3. LIGUSTRUM *foliis lanceolatis lucidis perennantibus, fructibus ovatis lateralibus*. *Carolina* blue-berried Bay.

The first sort grows common in the hedges in most parts of *England*, where it rises fifteen or sixteen feet high, with a woody stem covered with a smooth gray bark, sending out many lateral branches, garnished with spear-shaped leaves, ending with obtuse points, and are of a dark green. The flowers are white, and are produced in thick spikes at the end of the branches, having a tubular petal cut at the top in four parts, which spread open. These are succeeded by small round black berries, which ripen in the autumn. The leaves of this sort frequently remain green till after *Christmas*. There are two varieties of this, one with white, and the other hath yellow variegated leaves; but to preserve these varieties, they should be planted in poor land, for if they are in a rich soil, they will grow vigorous, and soon become plain.

The second sort grows naturally in *Italy*; this rises with a stronger stem than the former, the branches are less pliable, and grow more erect; their bark is of a lighter colour, the leaves are much larger, and end in acute points, and are also of a brighter green; they continue in verdure till they are thrust off by the young leaves in the spring. The flowers of this are rather larger than those of the common sort, and are seldom succeeded by berries in this country.

Both these sorts are cultivated in the nurseries near *London*, to furnish the small gardens and balconies in the city, the first being one of the few plants which will thrive in the smoke of *London*; but although they will live some years in the close part of the town, yet they seldom produce flowers after the first year, unless it is in some open places, where there is free air.

The *Italian* Privet is now generally preferred to the common sort, for planting in gardens, the leaves being larger, and continuing green all the year, renders it more valuable; and being so hardy as to resist the greatest cold in this country, it may be planted in any situation where the common sort will thrive. I have frequently planted it under the dropping of large trees, where I find it will thrive better than most other shrubs.

I cannot but think this sort, which is the most common in *Italy*, is the *Ligustrum* mentioned by *Virgil* in the second *Eclogue*: and my reason for it is, that as the flowers of this shrub are of a pure white, but fall off very soon, they are by no means proper to gather for garlands, &c. and the berries being of a fine black colour, and continuing long upon the plants, make a fine appearance. To confirm that these berries were gathered for use, we find in several authors of undoubted credit, that they were used in dyeing, as also that the best ink was made of these berries.

Besides, is it not much more reasonable to suppose, that *Virgil* would rather draw his comparison from the flowers and fruit of the same plant, when he is warning the youth not to trust to his beauty, than to mention two different plants, as has been generally supposed? for here are the white flowers of the Privet appearing early in the spring, which is an allusion to youth; but these are of short duration, soon falling away; whereas the berries, which may be applied to mature age, are of long continuance, and are gathered for use.

These plants are easily propagated by laying down their tender shoots in autumn, which in one year's time will be rooted enough to transplant; then they may be removed to the places where they are designed to remain, or planted in a nursery for two years, where they may be trained for the purposes designed.

They may also be propagated by cuttings, which if planted in the autumn on a shady border and in a loamy soil, will take root very freely, and may be afterward treated in the same way as the layers.

But the strongest and best plants, are those which are raised from seeds; indeed, this is a much more tedious method than the other, so is seldom practised, for the seeds generally lie a year in the ground before they vegetate; therefore, whoever would propagate the plants in this method, should gather the berries and put them in a pot with sand between them, and bury the pots in the ground, as is practised for Holly berries and Haws, and after they have laid a year in the ground, take them up and sow them on a border exposed to the east, where the plants will come up the following spring, and these will make great progress after they have gotten some strength, and will grow upright, and not send out suckers like the other.

Formerly these plants were greatly in use for hedges, but since so many other plants of greater beauty have been introduced, they have been almost rejected.

The two variegated kinds may be propagated by budding, or inarching them upon the plain sort, as also by laying down their branches; but as they seldom shoot so fast, as to produce many branches proper for layers, the other method is chiefly used. The silver striped sort is somewhat tenderer than the plain.

The third sort grows naturally in *Carolina* and some other parts of *North America*, where the inhabitants have given it the title of blue berried Bay. The seeds of this have been brought to *England* for several years past, and many of the plants have been raised in the gardens near *London*, but as they have not yet produced any flowers here, so we cannot be certain of its proper genus. Mr. *Catesby* has given a figure, and added a short description of it in his history of *Carolina*, under the title of *Ligustrum*, but neither his figure or description is clear enough to determine its genus; but as it cannot be a Bay, the flowers being all hermaphrodite, and ranged in long bunches, so I have added it to the genus of *Ligustrum*, until its true genus is ascertained.

Mr. *Catesby* in his description of this shrub, says it rises to the height of sixteen feet, the stem or trunk six inches diameter in its native soil; in *England* there are plants six feet high, but their stems are not large; the leaves are almost as large as those of the common Bay, of a lucid green, smooth and entire. These continue through the year. The plants which have been planted in the open air here, are generally placed against walls to a good aspect, where some of them have remained four or five years. These have much outgrown any of the plants which have been kept in pots and housed in winter, so that I would recommend their being planted in the full ground in a warm situation, for the great danger is of their tender shoots being hurt by the early frosts in autumn, especially if the plants make vigorous shoots; for those being repleat with moisture, are frequently nipped in the autumn, and when their extreme parts are killed, the disease descends lower in winter: therefore if their tops are sheltered in autumn to screen them from those early frosts, the plants may be preserved in the full ground.

This is propagated by the berries, which are brought to *England*; they should be sown in pots plunged into a moderate hot-bed, which will bring up the plants much better than if they are sown in the full ground: but the plants when up, must not be drawn up weak, to prevent which they should have plenty of air in warm weather, and screened from the sun in the heat of day. The following spring the plants should be each planted in a separate small pot, and plunged into a moderate hot-bed to forward their taking new roots, after which they should be gradually inured to bear the open air. For two or three years, while the plants are young, they should be sheltered in winter, then they may be planted in the full ground. It may also be propagated by layers; and the cuttings, if they are planted in the spring, and carefully managed, will take root.

LILAC. See Syringa.

LILIASTRUM. See Hemerocallis.

LILIO-ASPHODELUS. See Hemerocallis and Crinum.

LILIO-FRITILLARIA. See Fritillaria.

LILIO-HYACINTHUS. See Scilla.

LILIO-NARCISSUS. See Amaryllis.

LILIUM. Tourn. Inst. R. H. 369. tab. 191. The Lily.

The Characters are,

The flower has no empalement; it hath six petals reflexed at their points; each petal has a narrow longitudinal nectarium at their base. It hath six stamina which are erect, with a cylindrical oblong germen, which afterward becomes an oblong capsule, having three cells which are filled with flat seeds lying above each other, in a double order.

The Species are,

1. LILIUM foliis sparsis, corollis campanulatis erectis, intus glabris. Common white Lily with an erect flower.

2. LILIUM foliis sparsis, corollis campanulatis cernuis, petalis basi angustioribus. White foreign Lily with hanging flowers.

3. LILIUM foliis sparsis, corollis campanulatis erectis, intus scabris. Hort. Cliff. 120. Greater Lily with a purple Saffron-coloured flower; commonly called Orange Lily.

4. LILIUM humile, foliis linearibus sparsis, corollis campanulatis erectis, caule bulbifero. Smaller bulb-bearing Lily, by some called the fiery Lily.

5. LILIUM foliis sparsis subulatis, floribus reflexis, corollis revolutis. Hort. Cliff. 120. Narrow-leaved red Lily, or Martagon.

6. LILIUM foliis linearibus sparsis, pedunculis longissimis. Lily with short grassy leaves; commonly called Martagon of Pompony.

7. LILIUM foliis sparsis lanceolatis, floribus reflexis, corollis revolutis. Hort. Cliff. 120. Lily of Byzantium with a carmine flower; commonly called the scarlet Martagon.

8. LILIUM foliis sparsis lanceolatis, floribus pyramidalis reflexis, corollis revolutis. The great yellow Martagon.

9. LILIUM foliis verticillatis, floribus reflexis, corollis revolutis. Hort. Cliff. 120. Mountain Lily with reflexed flowers; commonly called purple Martagon.

10. LILIUM foliis verticillatis hirsutis, floribus reflexis corollis revolutis. Another Lily with reflexed hairy flowers; commonly called the red Martagon.

11. LILIUM foliis verticillatis, floribus reflexis, corollis campanulatis. Lin. Sp. Plant. 303. Martagon of Canada with spotted flowers.

12. LILIUM foliis verticillatis, floribus erectis, corollis campanulatis. Amern. Acad. 2. p. 348. Lily with leaves growing in whorls, and an erect bell-shaped flower.

13. LILIUM foliis verticillatis brevibus, corollis campanulatis, unguibus petalorum angustioribus, floribus erectis. Icon. tab. 165. Lily with very short leaves growing in whorls, and bell-shaped flowers, whose petals are very narrow at their base.

There is a greater variety of Martagons than are here mentioned, but as they are supposed to be only accidental arising from culture, so I thought it would be to little purpose to insert them here, therefore I shall only give their common titles hereafter.

The common white Lily is so well known as to need no description; this grows naturally in *Palesine* and *Syria*, but has been long cultivated in all the gardens of *Europe*. It is so hardy that no frost ever injure the roots, and it propagates so fast by offsets from the roots, that it becomes so common as to be little regarded, though there is great beauty in the flowers, which have an agreeable odour. Of this sort there are the following varieties:

The white Lily striped with purple.

The white Lily with variegated leaves.

The white Lily with double flowers.

These are varieties which have accidentally risen from culture; the sort with variegated flowers, has not been in *England* much more than forty years, but is now very common in most of the gardens, and is by some persons esteemed for the variety of its purple stripes; but as the pure white of the flower is stained by the purple, so as to appear of a dull colour, many prefer the common white Lily to this.

The sort with variegated leaves is chiefly valued for its appearance in winter and spring, for as the leaves come up early in the autumn which spread themselves on the ground, and being finely edged with broad yellow stripes, they make a pretty appearance during the winter and spring months. The flowers are the same as those of the common sort, but appear earlier in summer, which may be occasioned by the roots being weaker than those of the plain sort, for all variegated plants are weaker than those which are plain.

The white Lily with double flowers, is less valuable than either of the other, because their flowers rarely open well, unless they are covered with glasses to shelter them from the rain and dew, so often rot without expanding. These flowers have none of the agreeable odour which the single sort is valued for, even when they open the fairest; for as by the multiplicity of petals in the flowers, the parts of generation are destroyed, so there is a want of the fecundating powder from whence the odour is sent out.

The white Lily with dependent flowers was originally brought from *Constantinople*. This is by some supposed to be only a variety of the common sort, but is undoubtedly a distinct species; the stalk is much slenderer than the common, the leaves are narrower and fewer in number; the flowers are not quite so large, and the petals are more contracted at their base; these always hang downward, whereas those of the common sort grow erect. The stalks of this kind, sometimes are very broad and flat, and appear as if two or three were joined together; when this happens, they sustain from sixty to a hundred flowers, and sometimes more; this has occasioned many to think it a different sort, who have mentioned this with broad stalks and many flowers as a distinct species, though it is accidental, for the same root scarce ever produces the same two years.

These sorts are easily propagated by offsets, which the roots send out in so great plenty, as to make it necessary to take them off every other, or at most every third year, to prevent their weakening the principal roots. The time for removing of the roots is at the end of *August*, soon after the stalks decay, for if they are left longer in the ground, they will soon put out new fibres and leaves, when it will be improper to remove them, because that will prevent their flowering the following summer. They will thrive in almost any soil or situation, and as they grow tall and spread, so they must be allowed room; therefore in small gardens they take up too much space, but in large borders they are very ornamental.

The common Orange or red Lily is as well known in the *English* gardens, as the white Lily, and has been as long cultivated here. This grows naturally in *Austria*, and some parts of *Italy*. It multiplies very fast by offsets from the roots, and is now so common, as to be almost rejected; however, in large gardens these should not be wanting, for they make a good appearance when in flower, if they are properly disposed. Of this sort there are the following varieties:

The Orang Lily with double flowers.

The Orange Lily with variegated leaves.

The smaller Orange Lily.

These varieties have been obtained by culture, and are preserved in the gardens of florists. They all flower in

June and July, and their stalks decay in September, when the roots may be transplanted, and their offsets taken off, which should be done once in two or three years, otherwise their bunches will be too large, and the flower-stalks weak. This doth not put out new roots till toward spring, so that the roots may be transplanted any time after the stalks decay till November. It will thrive in any soil or situation, but will be strongest in a soft gentle loam not too moist.

The bulb-bearing fiery Lily, seldom rises much more than half the height of the former; the leaves are narrower, the flowers are smaller, and of a brighter flame colour; they are fewer in number, and stand more erect. These come out a month before the common sort, and the stalks put out bulbs at every joint, which, if taken off when the stalks decay, and planted, will produce plants, so that it may be propagated in plenty. There are several varieties of this, which are mentioned as distinct species, but are supposed to have been produced by culture. These are,

The greater broad-leaved bulb-bearing Lily.

The many flowered bulb-bearing Lily.

The small bulb-bearing Lily.

The hoary bulb-bearing Lily.

All these sorts of Lilies will thrive under the shade of trees, so may be introduced in plantations, and on the borders of woods, where they will have a good effect during the time they are in flower.

There is also a great variety of the Martagon Lily; these differ from the common Lilies, in having their petals reflexed backward in form of a Turk's turban, from whence many give them the title of Turk's Cap. In the gardens of the florists, particularly those in Holland, they make a great variety of these flowers, amounting to the number of thirty or upward; but in the English gardens, I have not observed more than a third of that number, and most of these are accidental, for those before enumerated are all that I think may be supposed specifically different. However, for the sake of such as are curious in collecting these sorts of flowers, I shall here mention those varieties which are to be found in the English gardens.

The common Martagon with double flowers.

The white Martagon.

The double white Martagon.

The white spotted Martagon.

The imperial Martagon.

The early scarlet Martagon.

The Constantinople vermilion Martagon.

The common Martagon with red flowers, which is the fifth sort before enumerated, has very narrow leaves, growing without order. The stalk rises near three feet high, sustaining at the top eight or ten bright red flowers, which stand at a distance from each other.

The sixth sort is called Martagon of Pompony. The stalks of this rise higher than those of the former, the leaves are shorter and set closer upon the stalks; each of these stalks sustain from fifteen to thirty flowers, of a very bright red approaching to scarlet. The foot-stalks of the flowers are very long, so that the head of flowers spreads out very wide; these hang downward, but their petals are reflexed quite back.

The seventh sort is commonly known by the title of scarlet Martagon. This rises with a stalk from three to four feet high; the leaves are much broader than those of the former sorts, and appear as if they were edged with white; they are placed very close upon the stalks, but without any order. The flowers are produced at the top of the stalk; they are of a bright scarlet, and are seldom more than five or six in number. This flowers late in July, and in cool seasons will continue in beauty great part of August.

The eighth sort rises with a strong stalk from four to five

feet high, garnished with leaves as broad as those of the last mentioned, which stand without order; the flowers are produced in form of a pyramid, on the upper part of the stalk. When the roots of this kind are strong, they produce forty or fifty flowers upon each stalk; they are large, of a yellow colour, spotted with dark spots, so make a fine appearance; but the flowers have such a disagreeable strong scent, that few persons can endure to be near them, which has occasioned their being thrown out of most English gardens.

The ninth sort is frequently called the purple Martagon, though in most of the old gardens it is known simply by the title of Turk's Cap. This rises with a strong stalk from three to four feet high, garnished by pretty broad leaves, which stand in whorls round the stalk, at certain distances. The flowers are of a dark purplish colour, with some spots of black; they are produced in loose spikes on the top of the stalks.

The tenth sort is very like the former, but the leaves are narrower; the whorls stand farther asunder, the leaves and stalks are somewhat hairy, and the buds of the flowers are covered with a soft down; the flowers are of a brighter colour with few spots, and come out earlier in the summer, though the stalks appear much later above ground.

The eleventh sort is commonly called the Canada Martagon, as it was first brought to Europe from thence, but it grows naturally in most parts of North America. The stalks rise from four to five feet high, garnished with oblong pointed leaves, placed in whorls round the stalk. The flowers are of a yellow colour, spotted with black, which are shaped like those of the Orange Lily; the petals are not turned backward, like those of the other sorts of Martagon.

The twelfth sort grows naturally in North America, and is also mentioned to grow at Campschatski. The flowers are shaped like those of the Canada Martagon, growing erect, but the petals of this are oval, not narrowed at their base as are those, and sit close to the foot-stalk; the flowers are of a deeper colour, and not so much spotted as those of the other sort.

The thirteenth sort grows naturally near Pennsylvania. The root of this is smaller than those of the other sorts, in the spring it sends out one upright stalk a foot and a half high; the leaves come out in whorls round the stalks; they are short, and have obtuse points. The stalk is terminated by two flowers which stand erect, upon short separate foot-stalks; they are shaped like the flowers of the bulb-bearing fiery Lily, but the petals are narrower at their base. The flowers are of a bright purple colour, marked with several dark spots toward their base.

All the sorts of Lilies may be propagated by offsets from the roots, which some of the sorts produce in plenty; but there are others which send out very few, which occasions their present scarcity. The roots of all the sorts of Martagon may be safely taken up when their stalks decay, and if there is a necessity for keeping the roots out of the ground, if they are wrapped in dry moss, they will keep perfectly well for two months, so that if their roots are to be transported to a distant place, this precaution of wrapping them up is necessary; but where they are to be planted in the same garden, there will be no occasion for this, especially if they are not kept too long out of the ground; for if the place is ready to receive the roots, they should be planted the beginning of October; so if the roots are put in a dry cool place, they will keep very good without any farther care; but if the ground is not ready to receive them till later in the year, then it will be proper to cover the roots with dry sand, or wrap them in moss to exclude the air, which, if they are much exposed to, will cause their scales to shrink, which weakens the roots, and is sometimes the occasion of their rotting.

These

These roots should be planted five or six inches deep in the ground, especially if the soil is light and dry; but where the ground is moist, it will be proper to raise the borders in which these are to be planted, five or six inches above the level of the surface of the ground; for if the water rises so high in winter as to come near the roots, it will cause them to rot; and where the soil is naturally stiff and subject to bind, there should be a good quantity of sea-coal ashes or rough sand, well mixed in the border, to separate the parts, and prevent the ground from binding in the spring, otherwise the roots will not send up very strong stalks, nor will they make so good increase.

As the *Canada*, *Pompony*, and the last sort of Martagons, are somewhat tenderer than the others, so if in very severe winters the surface of the ground over them is covered with old tanners bark or sea-coal ashes, it will be a good way to secure them from being injured by the frost; and in the spring the covering may be removed, before the roots shoot up their stalks.

The roots of all kinds of Martagons must never be transplanted after they have made shoots, for that will so much weaken them (if it does not entirely kill them) as not to be recovered in less than two or three years, as I have experienced to my cost; for being obliged to remove a fine collection of these roots early in the spring, I lost a great part of them, and the others were long recovering their strength.

All the sorts of Lilies and Martagons may also be propagated by sowing their seeds, by which method some new varieties may be obtained, provided the seeds are saved from the best sorts, especially the Martagons, which are more inclinable to vary than the other Lilies. The manner of sowing them being the same as for Tulips, the reader is desired to turn to that article for directions.

LILIUM CONVALLIUM. See Convallaria.

LILIUM PERSICUM. See Fritillaria.

LILIUM SUPERBUM. See Gloriosa.

LIME TREE. See Tilia.

LIMODORUM. *Lin. Gen. Plant.* Bastard Hellebore.

The Characters are,

The flowers have no empalment, but a spathe (or sheath) situated below them. The flower has five oval petals, which are dissimilar, so has much the appearance of a Butterfly flower. Within the petals is situated a concave nectarium, which is as long as the petals. It hath two stamina, which are as long as the petals, and a column-shaped germen, situated under the flower, which afterward turns to a capsule of the same form, opening with three valves, having one cell, in which are lodged four or five roundish seeds.

We have but one Species of this genus at present in England, viz.

1. LIMODORUM *foliis longis angustis acuminatis, pedunculis longissimis.* Limodorum with long narrow leaves ending in acute points, and a very long foot-stalk to the flower.

This plant grows naturally in *Jamaica*; it also grows in the *French* islands of *America*, and in the *Bahama Islands*; from several of these places I have received the roots.

The root of this plant is shaped like those of the Saffron, but the outer cover is of a darker brown colour; from this comes out three or four leaves, according to the size and strength of the root, which are nine or ten inches long, and near three quarters of an inch broad in the middle, being contracted toward both ends, terminating with long acute points; they have five longitudinal furrows, like the first leaves of young Palms; these leaves come out in the spring, and frequently decay the following winter, but when the plants are kept in a warm stove, they are seldom destitute of leaves. The flower-stalk arises immediately from the root, on one side of the leaves; this is naked,

smooth, and of a purplish colour toward the top. It is near a foot and a half high, terminated by a loose spike of purplish red flowers, composed of five or six petals; the two upper are connected together, forming a sort of helmet, the two side petals expand like the wings of a Butterfly flower, and the lower form a sort of keel. In the center of the petals is situated a column-shaped germen, which rises from their base, supporting a slender style, to which adhere two stamina; after the flowers are faded, the germen becomes a three-cornered column, which becomes a capsule with one cell, opening with three valves, containing several roundish seeds.

There are several other species of this genus mentioned by father *Plumier*, but I have not seen one more besides than this here mentioned, which had oval obtuse leaves, furrowed in the same manner as the leaves of this sort, but were of a thicker consistence; the flowers of this I have not yet seen. The root was sent me from *Maryland*, where it grew naturally in a thicket.

The sort here described is too tender to thrive in the open air in *England*; and although with care it may be preserved in a warm green-house, yet it seldom flowers in such a situation; so that to have it in perfection, it is necessary to keep it in the tan-bed in the stove in winter, and if in summer the pots are plunged in a tan-bed under a deep frame, the plants will thrive and flower as strong as in their native soil.

It is propagated by offsets from the root, which are sent out pretty freely when the plants are in vigour; these should be taken off, and the roots transplanted, when they are the most destitute of leaves,

LIMON. *Tourn. Inst. R. H.* 621. The Limon tree.

The Characters are,

The flower is composed of five oblong thick petals, which spread open; these sit in a small empalment of one leaf. It hath about ten or twelve stamina, which are joined in three or four bodies, and an oval germen, which afterward becomes an oval fruit, with a fleshy rind, inclosing a thin pulpy fruit with several cells, each having two hard seeds.

The Species are,

1. LIMON *foliis ovato-lanceolatis acuminatis, subserratis.* Limon tree with oval, spear-shaped, acute-pointed leaves, which are a little sawed; or common Limon.

2. LIMON *foliis ovatis integris, ramis subspinosis.* The Lime tree.

3. LIMON *foliis ovato-lanceolatis subserratis, fructu conglomerato.* Limon with oval spear-shaped leaves, which are somewhat sawed, and fruit growing in clusters.

There are great varieties of this fruit, which are preserved in some of the *Italian* gardens, and in both the *Indies* there are several which have not yet been introduced to the *European* gardens; but these, like Apples and Pears, may be multiplied without end from seeds, therefore I shall only mention the most remarkable varieties which are to be found in the *English* gardens at present, as it would be to little purpose to enumerate all those which are mentioned in the foreign catalogues.

The Limon tree with variegated leaves.

The sweet Limon.

The Pear-shaped Limon.

The imperial Limon.

The Limon called Adam's Apple.

The furrowed Limon.

The childing Limon.

The Limon with double flowers.

The common Limon and the sweet Limon are brought to *England* from *Spain* and *Portugal* in great plenty, but the fruit of the latter are not much esteemed. The Lime is not often brought to *England*, nor is that fruit much cultivated

in *Europe*, but in the *West-Indies* it is preferred to the Limon, the juice being reckoned wholesomer, and the acid is more agreeable to the palate; there are several varieties of this fruit in the *West-Indies*, some of which have a sweet juice, but those are not greatly esteemed; and as the inhabitants of those islands do not propagate these fruits by grafting or budding, being contented with sowing their seeds, so there is no doubt but a great variety of them may be found by any person who is curious in distinguishing them.

The Pear-shaped Limon is a small fruit, with very little juice, so is not much propagated any where; the curious who have room and convenience for keeping many of these trees, preserve a plant or two of this sort for the sake of variety.

The fruit of the imperial Limon is sometimes brought to *England* from *Italy*, but I do not remember to have seen any of this sort imported from *Spain* or *Portugal*, so that I suppose they are not much propagated in either of those countries; for the inhabitants of both those fine countries are so very incurious, especially in horticulture, as to truit almost entirely to nature, therefore the products of their gardens are inferior both in numbers and quality to the gardens in many other parts of *Europe*, where the climate is much less favourable for these productions. And in the article we are now upon, there are many strong instances of the slothfulness or incuriosity of the *Portuguese* particularly, for they had many of the most curious sorts of Orange, Limon, and Citron trees, brought from the *Indies* to *Portugal* formerly, which seemed to thrive almost as well there as in their native soil, and yet they have not been propagated; there are a few trees of these sorts still remaining in some neglected gardens near *Lisbon*, almost unnoticed by the inhabitants. As there are also several curious trees and plants, which were formerly introduced from both *Indies*, some of which thrive and produce fruit amidst the wild bushes and weeds, with which those gardens are spread over.

All the sorts of Limons are propagated by budding or inarching them either on stocks of Limons or Citrons, produced from seeds; but they will not so readily unite on Orange stocks, for which reason the Citrons are preferable to either Oranges or Limons for stocks, as they readily join with either sort, and being of quicker growth, cause the buds of the other sorts to shoot much stronger than if they were on stocks of their own kind. The method of raising these stocks, and the manner of budding them, being already exhibited under the article of *AURANTIUM*, it would be superfluous to repeat it here.

The culture of the Limon being the same with that of the Orange tree, it would be also needless to repeat it here; therefore I shall only observe, that the common Limons are somewhat hardier than the Oranges, and will bring their fruit to maturity with us better than they will do, and require to have a greater share of fresh air in winter.

LIMONIUM. *Tourn. Inst. R. H.* 341. tab. 177.

The Characters are,

The flowers have an imbricated perianthium, and are funnel-shaped, composed of five petals. It hath five awl-shaped stamens, crowned by prostrate summits, and a small germen, crowned by pointed stigmas. The empalement of the flower afterward becomes a capsule, shut close at the neck, but expanded above where the seeds are lodged.

The Species are,

1. LIMONIUM foliis ovato-lanceolatis, caule tereti nudo paniculato. Common great Sea Lavender.
2. LIMONIUM foliis oblongo-ovatis, caule paniculato patulo, spicis florum brevioribus. Sea Lavender with oblong oval leaves, a spreading paniculated stalk, and shorter spikes of flowers.
3. LIMONIUM foliis ovatis obtusis, petiolis decurrentibus,

caule paniculato, spicis florum erectioribus. Sea Lavender with oval obtuse leaves, running foot-stalks, a paniculated stalk, and more upright spikes of flowers.

4. LIMONIUM foliis lanceolatis, caule humile patulo, spicis florum tenuioribus. Sea Lavender with spear-shaped leaves, a low spreading stalk, and slender spikes of flowers.

5. LIMONIUM foliis lineari-lanceolatis, caule ramoso patulo, floribus distantibus uno versu dispositis. Sea Lavender with narrow spear-shaped leaves, a branching spreading stalk, and flowers ranged thinly on one side the stalk.

6. LIMONIUM foliis radicalibus alternatim pinnato-sinuatis, caulinis ternis triquetris subulatis, decurrentibus. Sea Lavender with the lower leaves alternately situated like wings, those upon the stalks three-cornered, awl-shaped, and running along the foot-stalk.

7. LIMONIUM caule fruticoso patulo, foliis lineari lanceolatis crassis, floribus solitariis distantibus. Sea Lavender with a spreading shrubby stalk, narrow, thick, spear-shaped leaves, and flowers growing singly at a distance from each other.

8. LIMONIUM foliis cuneiformibus, caule erecto paniculato, ramis inferioribus sterilibus nudis. Sea Lavender with wedge-shaped leaves, an upright paniculated stalk, and the under branches sterile and naked.

9. LIMONIUM caule nudo paniculato, foliis spatulatis retusis. Sea Lavender with a paniculated naked stalk, and spatula-shaped blunt leaves.

10. LIMONIUM caule nudo paniculato, tereti, foliis tuberculatis. Sea Lavender with a naked, taper, paniculated stalk, and leaves set with tubercles.

11. LIMONIUM caule erecto fruticoso, foliis lineari-lanceolatis obtusis, floribus alternis. Sea Lavender with an upright shrubby stalk, narrow spear-shaped leaves, ending in obtuse points, and flowers ranged alternately.

The first sort grows naturally in the marshes, which are flowed by the sea in several parts of *England*. The roots of this plant are thick, of a reddish colour, and an astringent taste, sending out many strong fibres, from which comes out several oval, spear-shaped, smooth leaves, of a pretty thick consistence. The stalk is naked, and rises upward of a foot high, divided into many small branches at the top, terminated by slender spikes of pale blue flowers, ranged on one side the stalk, coming out of narrow covers like sheaths.

The second sort grows naturally in the south of *France* on the sea coast. The leaves of this are of an oblong oval form, smooth, entire, and of a deep green. The stalk rises fifteen or sixteen inches high, dividing into several spreading branches, terminated by short spikes of pale blue flowers, ranged on one side the foot-stalk. This sort seldom flowers till the end of *August*, so never produces any good seeds in *England*.

The third sort grows naturally in *Narbonne* and *Provence*. This hath small, oval, obtuse leaves, standing on pretty long foot-stalks, which are bordered or winged. The stalk rises a foot and a half high, sending out branches alternately on each side, so as to form a loose kind of pyramid, and are terminated with spikes of pale blue flowers, which are erect.

The fourth sort grows naturally in *England*. It was first discovered on the sea banks near *Walden* in *Essex*, afterward near *Walden* in the same county, and since at the mouth of the river that runs from *Chichester* in *Suffex*. The leaves of this sort are spear-shaped, about three inches long, and one broad in the middle, lessening gradually to both ends. The stalk rises four or five inches high, dividing into many spreading branches, which are very thick set with short spikes of pale blue flowers.

The fifth sort was discovered by *Dr. Tournefort* in the *Levant*. The leaves of this sort are about four inches long, and

and three quarters of an inch broad in the middle, diminishing gradually to both ends. The stalks rise about five or six inches high, dividing into several spreading branches, which are terminated by short spikes of pale blue flowers, ranged on one side the foot-stalk. This sort flowers late in *August*, so never ripens seeds here.

The sixth sort grows naturally in *Sicily* and *Palestine*. This is a biennial plant. The lower leaves, which spread on the ground, are indented almost to the middle rib; these indentures are alternate and blunt. The stalks rise a foot and a half high, dividing upward into several branches, garnished at each joint with three narrow leaves sitting close to the stalks, from whose base proceeds a leafy membrane, or wing, which runs along on both sides the stalk. The stalks are terminated by panicles of flowers, which sit upon winged foot-stalks, each sustaining three or four flowers of a light blue colour, which continue long without fading.

The seventh sort grows naturally in *Sicily*. This hath a shrubby stalk, which rises about two feet high, dividing into several ligneous branches, which spread out on every side; the lower part of these are closely garnished with gray leaves, like those of the sea Purslain, of as thick consistence. The branches are terminated by panicles of blue flowers, which come out singly at a distance from each other, having long tubes, but divide into five segments upward, which spread open.

The eighth sort grows naturally in *Sicily*, and was found so growing on the border of the sea in *Norfolk*, by Mr. *Henry Scott*, a gardener. The lower leaves of this sort are narrow at their base, but enlarge upward, and are rounded at the top, in shape of a wedge. The stalks are slender and stiff, rising from seven to fourteen inches high, sending out many slender side branches; all those which proceed from the lower part of the stalk are barren, having no flowers, but toward the top they have short panicles of whitish flowers, which are small, and sit three or four together upon one foot-stalk.

The ninth sort grows naturally near the sea, about *Marseilles* and *Leghorn*. This hath many thick fleshy leaves, which are shaped like a spatula, growing near the root, which are smooth, of a grayish colour, and spread on the ground. The stalks are naked, and rise about six inches high, dividing toward the top into many small branches, which are terminated by short crooked panicles of small flowers, of a pale red colour.

The tenth sort grows naturally about *Montepelie*r and in *Italy*. This is an annual plant, with long narrow leaves, which are set with rough tubercles like the leaves of *Viper Bugloss*. The stalks rise about eight inches high, dividing into two or three small branches, which are terminated by reflexed short spikes of pale blue flowers, which come out late in *August*, so the seeds are seldom perfected in *England*.

The eleventh sort grows naturally in *Egypt*. This rises with an upright shrubby stalk to the height of eight or ten feet, divided into many branches, which are garnished with narrow spear-shaped leaves, placed without order, of a thick consistence, and of a gray colour, sitting close to the branches. The flowers are produced at the end of the branches in loose panicles, standing alternate on each side the stalk; they have pretty long tubes, which enlarge upward, where they are cut into five obtuse segments, which spread open; they are of a bright sky blue, but fade to a purple before they fall off.

The first, second, third, fourth, and fifth sorts are abiding plants, which will thrive in the open air in *England*. These plants may be transplanted at almost any time of the year, provided they are carefully taken up, preserving some earth to their roots. These plants do not propagate very fast in

gardens, and unless they are planted in a moist shady border, do seldom flower well; the best way to have them succeed, is to keep the plants in pots, and in summer to place them in a shady situation; but in winter they may be removed to a place where they may enjoy the sun.

The sixth sort is a biennial plant, which rarely perfects seeds in *England*; so that unless fresh seeds can be procured from warm countries, where they ripen well, it will be very difficult to continue the sort. If the seeds can be obtained time enough to sow them in the autumn, the plants will come up the following spring, but when they are sown in the spring, they seldom grow the same year. The seeds should be sown on a border of loamy earth, but not stiff or moist, exposed to the south-east. When the plants come up, they must be kept clean from weeds, and if they are too close, some of them should be carefully taken out as soon as they are fit to remove, and planted in small pots, placing them in the shade till they have taken new root; then they may be placed where they may enjoy the morning sun till autumn, when they should be put into a hot-bed frame, where they may be screened from hard frost, but enjoy the free air in mild weather; those plants which are left in the border where they were sown, should be covered with mats in hard frost; for though they will often live through the winter in mild seasons, yet hard frost will always destroy them. The following summer the plants will flower, and if the season proves warm and dry, they will sometimes ripen seeds.

The seventh and eleventh sorts are shrubby plants, which are too tender to live through the winter in the open air in *England*, so the plants must be removed into shelter in the autumn, but they only require protection from hard frost: these plants may be placed with *Myrtles*, *Oleanders*, and other hardy green-house plants, where they often continue in flower great part of winter, and make a pretty variety. These sorts are easily propagated by cuttings, which, if planted in *July* on a shady border, and duly watered, will take root in six or seven weeks, when they should be taken up and planted in pots filled with light loamy earth, placing them in the shade till they have taken root; then they may be exposed till *October*, at which time they must be removed into shelter.

LINARIA. *Tourn. Inst. R. H.* 168. tab. 76. Toad-flax.

The Characters are,

The flower hath one petal, and is of the ringent kind, having an oblong swelling tube, with two lips above, and the chaps stout. The upper lip is bifid and reflexed on the sides, the lower lip is trifid and obtuse. It hath an oblong nectarium, prominent behind, and four stamina which are included in the upper lip, two of which are shorter than the other, and a roundish germen, which afterward turns to a roundish obtuse capsule with two cells, filled with small seeds.

The Species are,

1. LINARIA foliis lanceolato-linearibus confertis, caule erecto, spicis terminalibus sessilibus. Common yellow Toad-flax with a larger flower.

2. LINARIA foliis ternis ovatis. Toad-flax with oval leaves placed by threes.

3. LINARIA foliis quaternis lanceolatis, caule erecto ramoso, floribus pedunculatis. Toad-flax with spear-shaped leaves placed by fours, an upright branching stalk, and flowers upon foot-stalks.

4. LINARIA foliis subquaternis linearibus, caule diffuso, floribus racemosis. Toad-flax with linear leaves placed by fours on the lower part of the stalk, a diffused stalk and branching flowers.

5. LINARIA foliis lanceolato-linearibus sparsis, caule florifero erecto spicato. Toad-flax with spear-shaped linear leaves, and the flower-stalks erect and spiked.

6. LINARIA

6. *LINARIA foliis linearibus confertis, caule erecto ramoso, floribus spicatis terminalibus.* Toad-flax with linear leaves in clusters, an erect branching stalk, and flowers in spikes terminating the stalks.

7. *LINARIA foliis inferioribus quinque linearibus.* Toad-flax with linear leaves, placed by fives at the lower part of the stalks.

8. *LINARIA foliis lanceolatis sparsis, inferioribus oppositis, nectariis subulatis, floribus subsessilibus.* Toad-flax with spear-shaped sparsed leaves, which on the lower part of the stalk are opposite, awl-shaped nectariums, and flowers sitting almost close.

9. *LINARIA foliis linearibus confertis, caule nitido paniculato, pedunculis spicatis nudis.* Toad-flax with linear leaves in clusters, a shining paniculated stalk, and flowers in spikes on naked foot-stalks.

10. *LINARIA foliis lanceolatis hirtis alternis, floribus spicatis, foliolo calycino supremo maximo.* Toad-flax with alternate, hairy, spear-shaped leaves, flowers in spikes, and the upper leaf of the empalement very large.

11. *LINARIA foliis caulibus linearibus sparsis, radicalibus rotundis.* Toad-flax with linear leaves placed sparsedly on the stalks, and the lower leaves round.

12. *LINARIA foliis lineari-lanceolatis alternis, floribus racemosis, calycibus corollâ longioribus.* Toad-flax with linear spear-shaped leaves placed alternate, branching flowers, and empalements longer than the petals.

13. *LINARIA foliis lanceolatis alternis, caule suffruticoso.* Toad-flax with spear-shaped alternate leaves, and an under-shrub stalk.

14. *LINARIA foliis lanceolatis acuminatis, paniculâ virgatâ.* Toad-flax with spear-shaped acute-pointed leaves, and a rod-like panicle.

15. *LINARIA foliis ovatis alternis, caule flaccido procumbente.* Toad-flax with oval leaves placed alternate, and a weak trailing stalk; called Fluellin.

16. *LINARIA foliis hastatis alternis, caule flaccido procumbente.* Toad-flax with arrow-pointed leaves placed alternate, and a weak trailing stalk.

17. *LINARIA foliis cordatis quinquelobatis alternis glabris.* Toad-flax with heart-shaped leaves having five lobes, which are alternate and smooth; or common Cymbalaria.

The first of these plants grow in great plenty upon the sides of dry banks in most parts of *England*, and is rarely permitted a place in gardens, for it is a very troublesome plant to keep within bounds. This is one of the species mentioned in the catalogue of simples at the end of the College Dispensatory, to be used in medicine.

The second sort grows naturally about *Valencia* and in *Sicily*. This is an annual plant, which rises with an upright branching stalk a foot and a half high, garnished with oval, smooth, gray leaves, placed often by threes, and sometimes by pairs opposite; the flowers grow in short spikes at the top of the stalks; they are yellow, and shaped like those of the common sort, but have not so long tubes.

There is a variety of this whose flowers have a purple standard and spur, which makes a pretty appearance in a garden.

These are propagated by seeds, which should be sown in the spring, on the borders of the flower-garden where they are designed to remain, and when the plants come up, they should be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The third sort rises with upright stalks two feet high, garnished with spear-shaped smooth leaves, placed sometimes by fours round the stalk, and at others by pairs opposite; the stalks are terminated by large purple flowers with long spurs, standing upon foot-stalks; it seldom ripens seeds in *England*. This grows naturally in *Portugal* and *Spain*.

This is tenderer than the last, so should have a warm situation, otherwise the plants will be destroyed in winter. It is propagated by seeds in the same manner as the former, but it is advisable always to keep some of these plants in pots, that they may be removed into shelter in winter.

The fourth sort grows naturally about *Verona*. This is a perennial plant, from whose roots arise several diffused stalks about eight inches long, garnished with narrow, short, gray leaves, placed by fours round the stalks at bottom, but upward they are opposite; the stalks are terminated by short branching tufts of pale yellow flowers, with golden chaps.

The fifth sort grows naturally in the south of *France* and in *Italy*. This hath a perennial root, sending out many stalks; those of them which support the flowers are erect, but the other are weaker, and hang loosely on every side the plants; they are garnished with long, narrow, spear-shaped, gray leaves, placed sparsedly. The stalks are terminated by long loose spikes of blue flowers, which appear in *June*, *July*, and *August*, and the seeds ripen in the autumn.

The sixth sort grows naturally about *Henley* in *Oxfordshire*, and also in some parts of *Hertfordshire*. This hath a perennial creeping root, from which arise many stalks two feet high, garnished with narrow leaves, growing in clusters toward the bottom, but upward they are sometimes by pairs, and at others single. The flowers are of a pale blue, produced in loose spikes at the end of the stalks.

The seventh sort grows naturally in *Sicily*. This is an annual plant, from whose root arises many slender stalks about a foot high; their lower part are garnished with five very narrow leaves at each joint, but upward they are sometimes by pairs, and others they are single: the stalks are garnished with small yellow flowers, coming out single, and are shaped like those of the other species. The flowers appear in *July*, and the seeds ripen in the autumn. There are two varieties of this, one with a deep yellow, the other a sulphur-coloured flower.

This is propagated by seeds in the same manner as the second sort, or if the seeds are permitted to scatter, the plants will come up without care, and if they are kept clean from weeds, will produce their flowers early in the summer.

The eighth sort grows naturally on the rocks about *Gibraltar*, from whence the late Sir *Charles Wager* brought the seeds. This has a perennial root, sending out many slender succulent stalks, which are weak, and hang near the ground, garnished with short, narrow, spear-shaped leaves, of a gray colour and succulent, standing without order. The flowers are produced at the end of the stalks in small bunches; they are yellow, marked with purple stripes, and the chaps of the flower, as also the spur, are of a dark purple colour. They appear in *June* and *July*, but do not produce seeds in *England*.

This plant is easily propagated by planting cuttings in any of the summer months, which, if watered and shaded, will soon take root, and may afterwards be planted in pots filled with fresh, light, undunged earth, in which they will succeed much better than in a richer soil. These must be removed into shelter in winter, where they must have as much free air as possible in mild weather, and be only protected from severe cold; so that if the pots are placed under a hot-bed frame, it will be better than in a green-house, where they are apt to draw too much, which will cause them to decay.

The ninth sort grows naturally in *Wales*, particularly near *Pemryn*. This hath a perennial root, from which arise many branching stalks two feet high, garnished with very narrow leaves, growing in clusters, of a grayish colour. The flowers are produced in loose spikes at the end of the branches; they are of a pale blue colour, and smell sweet.

The seeds ripen in the autumn, which, if permitted to scatter, will furnish a supply of young plants without any further care.

The tenth sort grows naturally in *Spain*; the seeds of it were sent me by Dr. *Hortega* from *Madrid*. This is an annual plant, which rises with a single stalk about a foot and a half high, garnished with hairy spear-shaped leaves, sitting close to the stalk, placed alternate. The flowers grow on the top of the stalks in loose spikes; they are of a pale yellow colour, with a few deep stripes, and the chaps are of a gold colour; the upper segment of the empalement is much larger than the lower.

The seeds of this sort should be sown in the spring, upon a border of light earth, where the plants are designed to remain; and when the plants come up, they must be treated in the same way as those of the second sort.

The eleventh sort grows naturally in *France*. This is an annual plant, whose bottom leaves are round; the stalks are slender, branching, and rise a foot high, garnished with very narrow leaves at each joint. The flowers are produced in loose spikes at the end of the branches; they are of a bright blue colour; the seeds ripen in the autumn, at which time they should be sown; for those which are sown in the spring, frequently lie in the ground till the spring following, before the plants appear. When the plants come up, they must be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The twelfth sort grows naturally in *Sicily*. This is an annual plant, which rises with a branching stalk two feet high, garnished with very narrow spear-shaped leaves placed alternately. The flowers are produced singly all along the branches; they are small, white, and have very long tails or spurs. This flowers in *July*, and the seeds ripen in the autumn. If the seeds of this sort are permitted to scatter, the plants will come up without care, and require no other culture but to keep them clean from weeds.

The thirteenth sort grows naturally in *Crete*, and also in *Dalmatia*. This rises with a strong ligneous stalk three feet high, garnished with smooth spear-shaped leaves placed alternate, sitting close to the stalk. The flowers are produced at the end of the branches in short loose spikes; they are of a deep yellow colour, and much larger than those of the common sort, standing upon short foot-stalks. It is propagated by seeds, which should be sown early in the spring, upon a border of light earth; and when the plants come up, and are fit to remove, some of them should be planted in pots, to be sheltered under a common frame in winter. As these plants only require to be protected from hard frost, so in mild winters they will live abroad without shelter, if they are upon a dry soil; therefore a part of the plants may be planted on a warm border of poor sandy soil, where they will live through our common winters very well; and those plants which grow in rubbish and are stunted, will endure much more cold than the others.

The fourteenth sort grows naturally in *Siberia*. This is a biennial plant, which rises with an upright branching stalk, from three to four feet high, garnished with spear-shaped leaves, ending in acute points, of a grayish colour, placed alternate. The flowers are produced at the end of the branches in loose panicles; they are of a bright yellow colour, shaped like those of the other sorts. This flowers in *June* and *July*, and the seeds ripen in autumn, which, if permitted to scatter, the plants will come up the following spring, and require no other care but to thin them where they are too close, and keep them clear from weeds.

The fifteenth sort is frequently called *Fluellin*, and is sometimes used in medicine; it grows naturally amongst *Wheat* and *Rye* in several parts of *England*. It is an annual plant, with weak, trailing, hairy stalks, which spread

on the ground, garnished with oval leaves, placed alternately; at each joint comes out one flower, shaped like those of the other species. The upper lip is yellow, and the under is purple.

The sixteenth sort differs from the fifteenth, in nothing but the shape of the leaves, which in this are shaped like the point of an arrow, and those of the other are oval; this is more commonly found in *England* than the other.

The seventeenth sort was brought from *Italy* to *England*, where it now grows in as great plenty in the neighbourhood of *London*, as if it was in its native country, growing from the joints of walls, where-ever the seeds happen to scatter. It is a perennial plant, which will thrive in any soil or situation, so that where it is once established, it will be difficult to root out, for the seeds will get into any joints of walls, or the decayed parts of pales, as also in the hollow of trees, where they grow and propagate plentifully; for the stalks put out roots at their joints, so spread themselves to a great distance.

LINGUA CERVINA, Hart's Tongue.

These plants commonly grow out from the joints of old walls and buildings, where they are moist and shady, and also upon shady moist banks, but are seldom cultivated in gardens. There is a very great variety of these plants, both in the *East* and *West-Indies*, but there are very few species of them in *Europe*; all the hardy sorts may be propagated by parting their roots, and should have a moist soil and shady situation.

LINUM. *Tourn. Inst. R. H.* 339. *tab.* 176. Flax.

The Characters are,

The flower has five large oblong petals, which spread open. It hath five awl-shaped erect stamina. In the center is situated an oval germen, which afterward turns to a globular capsule with ten cells, opening with five valves; in each cell is lodged one oval, plain, smooth seed.

The Species are,

1. LINUM *calycibus capsulisque mucronatis, petalis crenatis, foliis lanceolatis alternis, caule subsolitario.* *Lin. Sp. Plant.* 277. Common manured Flax.

2. LINUM *calycibus capsulisque mucronatis, petalis emarginatis, foliis lanceolatis alternis, caule ramoso.* Low manured Flax with a larger flower.

3. LINUM *calycibus acuminatis, foliis lanceolatis sparsis striatis scabris acuminatis, caule tereti basi ramoso.* *Lin. Sp. Plant.* 278. Wild blue Flax with an acute leaf.

4. LINUM *calycibus acuminatis, foliis sparsis linearibus setaceis retrorsum scabris.* *Lin. Sp. Plant.* 278. Narrow-leaved wild Flax, with a pale purplish, or flesh-coloured flower.

5. LINUM *calycibus capsulisque acuminatis, caule subnudo scabro, foliis acuminatis.* Greater blue perennial Flax with larger heads.

6. LINUM *calycibus capsulisque obtusis, foliis alternis lanceolatis acutis, caulibus ramocissimis.* *Plant.* 166. Flax with obtuse empalements and capsules, alternate spear-shaped, acute leaves, and very branching stalks; commonly called *Siberian* perennial Flax.

7. LINUM *calycibus acutis, foliis lineari-lanceolatis sparsis, caule paniculato.* Flax with acute empalements, linear spear-shaped leaves placed without order, and a paniculated stalk.

8. LINUM *calycibus patulis acuminatis, foliis linearibus alternis, caule ramoso.* Flax with spreading acute-pointed empalements, linear alternate leaves, and a branching stalk.

9. LINUM *calycibus hirsutis acuminatis sessilibus alternis, caule corymbofo.* *Lin. Sp. Plant.* 277. Broad-leaved, hairy, wild Flax, with a blue flower.

10. LINUM *calycibus foliisque lanceolatis striatis mucronatis, margine scabris.* *Lin. Sp. Plant.* 279. Flax with spear-shaped leaves and empalements, which end in acute points, and have rough edges; or the *Passerini Lobellii.* *J. B.* 3. p. 454.

11. LINUM

11. LINUM *calycibus acutis, petalis integris, foliis inferioribus linearibus fasciculatis, superioribus alternis, caule suffruticoso.* Wild Flax with a shrubby stalk and acute leaves.

12. LINUM *foliis lanceolatis alternis, floribus alternis sessilibus, caule simplici.* Yellow Flax with single flowers growing from the joints.

13. LINUM *foliis oppositis ovato-lanceolatis, caule dichotomo, corollis acutis.* Hort. Cliff 372. Meadow Flax with small flowers; commonly called Mountain Flax.

14. LINUM *calycibus ovatis acutis muticis, foliis lanceolatis inferioribus oppositis.* Lin. Sp. Plant. 280. Yellow maritime Flax.

The first sort is the Flax which is cultivated in most parts of Europe, but particularly in the northern parts. This is an annual plant, which usually rises with a slender unbranched stalk a foot and a half high, garnished with narrow spear-shaped leaves, placed alternate, ending in acute points, of a gray colour. The flowers are produced on the top of the stalks, each stalk sustaining four or five blue flowers, composed of five petals, which are narrow at their base, but broad at the top, where they are slightly crenated. The flowers appear in June and July, and are succeeded by roundish capsules, which have ten cells, opening with five valves, which are terminated by acute points; each cell contains one smooth flattish seed, of a brown colour. The seeds ripen in September, and the plants soon after perish.

When this plant is cultivated in the fields after the usual method, it seldom rises higher than is before-mentioned, nor do the stalks branch out; but when they are allowed more room, they will rise between two and three feet high, and put out two or three side branches toward the top, especially if the soil is pretty good where it is sown.

The second sort differs from the first, in having stronger and shorter stalks branching out much more. The leaves are broader, the flowers are larger, and the petals are indented at their extremities. The seed-vessels are also much larger, and the foot-stalks are longer.

The third sort grows naturally in the south of France, in Italy, and Spain. This rises from a foot to eighteen inches high, branching out almost to the bottom into many long slender branches, garnished with narrow spear-shaped leaves. The flowers are produced at the end of the branches, almost in form of an umbel; they are smaller than those of the manured sort, and are of a paler blue colour.

The fourth sort grows naturally about Vienna and in Hungary. This seldom rises more than a foot high, with a slender stalk, which divides into three or four naked foot-stalks at the top, each sustaining two or three flowers, which are of a pale blue colour.

The fifth sort grows naturally in some parts of England. This hath a perennial root, from which arise three or four stalks, garnished with a few short narrow leaves toward their base, but upward have scarce any. The flowers are blue, and are produced at the end of the stalks, which are succeeded by pretty large round seed-vessels, ending in acute points. The roots will continue three or four years.

The sixth sort grows naturally in Siberia. It hath a perennial root, from which arise several strong stalks, in number proportional to the size of the root, and in height according to the goodness of the soil where it grows; for in rich moist ground they will rise near five feet high, but in middling ground about three feet; these divide into several branches upward, garnished with narrow spear-shaped leaves, placed alternate. The flowers are produced at the end of the branches, forming a kind of umbel; they are large, and of a fine blue colour. These appear in June, and are succeeded by obtuse seed-vessels, which ripen in September.

The seventh sort grows naturally in Spain. This hath a biennial root, from which come out several trailing stalks,

which never rise much from the ground, but between these come out upright stalks, which rise upward of two feet high, garnished with pretty long narrow spear-shaped leaves, placed without order. The flowers grow in a sort of panicle toward the upper part of the branches; they are like those of the common sort, and are of the same colour.

The eighth sort I received from Istria. This hath a biennial root, from which arise two or three stalks, which divide into several branches, garnished with short, narrow, acute-pointed leaves, placed alternately. The flowers come out from the side of the branches, standing upon long foot-stalks. They are of the same size and colour as the common Flax, and appear at the same season. The seeds ripen in the autumn, and the roots abide two years.

The ninth sort grows naturally in Hungary and Austria. This hath a perennial root, from which arise several strong stalks two feet high, dividing into several branches, garnished with broader leaves than the other species, which are hairy. The flowers grow along the stalks alternately; they are large, and of a deep blue colour, appearing at the same time with the common sort, and the seeds ripen in the autumn.

The tenth sort grows naturally in Germany and the south of France, amongst the Corn. This is an annual plant, rising with an upright stalk a foot and a half high, garnished with spear-shaped, acute-pointed leaves, which are rough on their edges, placed alternately. The stalks divide into several branches, each sustaining two or three yellow flowers, which appear in July, but unless the autumn proves favourable, the seeds never ripen in England.

The eleventh sort grows naturally in Spain. This hath a shrubby stalk, which rises a foot high, sending out several branches, garnished with very narrow leaves, coming out in clusters. The flowers are produced at the end of the branches, standing erect, upon long slender foot-stalks. The petals of the flower are large, entire, and white, but before the flowers open they are of a pale yellow colour. These flowers appear in July, but unless the autumn proves favourable, the seeds do not ripen in England.

The twelfth sort grows naturally upon the Alps. This hath a perennial root, from which arise two or three slender stiff stalks, which divide into two or three smaller, garnished with spear-shaped leaves, placed alternately. The flowers come out singly at the joints; they are yellow, and appear about the same time with the common sort, and the seeds ripen in the autumn.

The thirteenth sort grows common in many parts of England, upon dry barren hills. It is commonly called *Linum catharticum*, or purging Flax, and also mountain Flax. This rises with several branching slender stalks about seven or eight inches high, garnished with small, oval, spear-shaped leaves placed opposite. The flowers are small and white, standing upon pretty long foot-stalks. They appear in July, and are succeeded by small round capsules, containing small flat seeds, which ripen in the autumn.

The fourteenth sort grows naturally about Montpelier. This rises with upright stalks two feet high, the lower part of which are garnished with spear-shaped leaves placed opposite, but on the upper part they are alternate. The stalks divide into several branches terminated with yellow flowers, about the size of those of common Flax, which are succeeded by small oval capsules, containing smaller seeds than those of the common Flax.

The first sort is that which is cultivated for use in divers parts of Europe, and is reckoned an excellent commodity; the right tilling and ordering of which, is esteemed a good piece of husbandry.

The ground in which this is to be sown, should be as clean from weeds as possible; in order to have it so, it

should be fallowed two winters and one summer, observing to harrow it well between each ploughing, particularly in summer, to destroy the young weeds soon after they appear, that the smallest of them may not stand to ripen their seed; this will also break the clods, and separate their parts so, as that they will fall to pieces on being stirred. If the land should require dung, that should not be laid on till the last ploughing, but this dung should be such as is clear from the seeds of weeds. Just before the season for sowing of the Flax seed, the land must be well ploughed, laid flat and even, upon which the seeds should be sown about the latter end of *March*, when the weather is mild and warm.

The common way is to sow the seed in broad-cast, and to allow from two to three bushels of seeds to one acre of land; but from many repeated trials, I have found it is a much better method to sow the seeds in drills, at about ten inches distance from each other, by which half the quantity of seed which is usually sown, will produce a greater crop; and when the Flax is thus sown, the ground may be easily hoed between the rows to destroy the weeds, which, if twice repeated in dry weather, will keep the ground clean till the Flax is ripe: this may be performed at half the expence which the hand weeding will cost, and will not tread down the plants, nor harden the ground, which by the other method is always done; for it is absolutely necessary to keep the Flax clean from weeds, otherwise they will overbear and spoil the crop.

There are some people who recommend the feeding of sheep with Flax, when it is a good height; and say, they will eat away the weeds and Grass, and do the Flax good; and if they should lie in it, and beat it down or flatten it, it will rise again the next rain: but this is a very wrong practice, for if the sheep gnaw or eat the Flax, the plants will shoot up very weak stalks, which never come to half the size they would have done, if not cropped; and as to the sheep destroying the weeds, they never are so nice distinguishers, for if they like the crop better than the weeds, they will devour that, and leave the weeds untouched.

Toward the latter end of *August* the Flax will begin to ripen, when you must be careful that it grow not over ripe; therefore you must pull it up as soon as the heads begin to change brown and hang downwards, otherwise the seeds will soon scatter and be lost, so that the pluckers must be nimble, and tie it up in handfuls, setting them upright till they be perfectly dry, and then house them. If the Flax be pulled when it first begins to flower, it will be whiter than if it stand till the seed is ripe, but then the seed will be lost; but the thread will be stronger when the Flax is left till the seed is ripe, provided it does not stand too long, but the colour of it will not be so good.

The *Siberian* perennial Flax has been made trial of, and answers very well for making of common strong linen, but the thread spun from this is not so fine or white as that which is produced from the common sort; but as the roots of this sort will continue many years, so there will be a great saving in the culture, as it will require no other care but to keep it constantly clean from weeds; which cannot be well done, unless the seeds are sown in rows, that the ground may be constantly kept hoed to destroy the weeds when young, for if they are suffered to grow large, it will be difficult to get the ground clean, and they will weaken the roots. This sort must have the stalks cut off close to the ground when ripe, and tied up in small bundles, managing them afterward in the same way as the common sort.

The eighth sort which I received from *Istria*, produced

the finest thread; it grows taller than the common Flax, and having a biennial root, it may be worthy of trial to see how it will thrive in the open fields, for in gardens it lives through the winter without receiving the least injury from the frost. In order to make trial of its goodness, I gave a parcel of the stalks of this, as also of the *Spanish* and the *Siberian* perennial Flax, to a person who is well skilled in watering, breaking, and dressing of Flax, who prepared them, and assured me, that the *Istrian* Flax was by much the finest of the three, and equal in goodness to any he had seen.

The other sorts which are here mentioned, are preserved in gardens for the sake of variety, but none of them are used, except the mountain Flax, which is esteemed a good purger in dropical disorders, and has of late years been often prescribed.

They are all of them propagated by seeds, which may be sown in the spring, in the places where they are to remain, and will require no other culture, but to keep the plants clean from weeds. The annual sorts will flower and perfect their seeds the same year, but the roots of the perennial sorts will continue several years, putting out fresh stalks every spring. The shrubby sorts will live through the winter in the open air, provided it is in a dry soil and a warm situation, but these rarely produce seeds in *England*.

LINUM UMBILICATUM. See Cynoglossum.

LIPPIA. *Houft. Gen. Nov. Lin. Gen. Plant.* 699.

The Characters are,

The flower hath one petal, which is of the ringent kind. It hath four short stamina, two of which are a little longer than the other, and an oval germen, which afterward turns to a compressed capsule with one cell, opening with two valves, which appear like the scales of the empalement, inclosing two seeds which are joined.

We know but one Species of this plant at present, viz.

LIPPIA *arborescens, foliis conjugatis oblongis, capitulis squamosis & rotundis. Houft.* Tree Lippia, with oblong leaves growing by pairs, having round scaly heads.

This plant, in the country of its native growth, commonly rises to the height of sixteen or eighteen feet, it has a rough bark; the branches come out opposite, as do also the leaves, which are oblong, pointed, and a little sawed on their edges. From the wings of the leaves come out the foot-stalks, which sustain many round scaly heads, about the size of a large gray Pea, in which are many small yellow flowers appearing between the scales, which are succeeded by seed-vessels.

This plant will not thrive in this climate, unless it is preserved in a warm stove, so should be treated in the same manner as other shrubby plants, which are natives of warm countries; which is, to keep them always in the stove, plunged in the bark-bed, observing to give them a large share of air in warm weather, and frequently refresh them with water; but in winter they must be watered more sparingly, and kept in a moderate degree of warmth, otherwise they will not live through the winter, especially while they are young; but when they have acquired strength, they may be preserved with a less share of warmth.

LIQUIDAMBER. *Lin. Gen. Plant.* 955. Liquidamber, sweet Gum, or Storax tree.

The Characters are,

It hath male and female flowers on the same tree; the male flowers are disposed in long, loose, conical katkins; these have four-leaved empalements, no petals, but a great number of short stamina joined in one body. The female flowers are situated at the base of the male spike, collected in a globe; these have a double empalement. They have no petals, but an oblong germen fastened

to the empalement, which afterward turns to a roundish capsule of one cell, with two valves at the top, which are collected in a ligneous globe, containing many oblong acute-pointed seeds.

The Species are,

1. LIQUIDAMBER *foliis quinquelobatis serratis*. Liquidamber with sawed leaves having five lobes; or Maple-leaved Storax tree.

2. LIQUIDAMBER *foliis quinquelobatis, sinuatis obtusis*. Liquidamber with leaves having five lobes, which are sinuated and obtuse.

The first sort has by some writers been ranged with the Maple, but on no other account, except from the similitude of the leaves; for in flower and fruit it is very different from the Maple, and most other genera: nor has it any affinity to the Storax tree, but the gum which issues from this tree being transparent, and having a great fragrancy, has by some ignorant persons been taken for that.

It grows plentifully in *Virginia*, and several other parts of *North America*, where it rises with a strait naked stem to the height of fifteen or sixteen feet, and branches out regularly to the height of forty feet or upward, forming a pyramidal head. The leaves are angular, and shaped somewhat like those of the lesser Maple, having five lobes, but are of a dark green colour; a strong, sweet, glutinous substance exudes through the pores of the leaves in warm weather, which renders them clammy to the touch.

The flowers are generally produced early in the spring of the year, before the leaves are expanded, which are of a Saffron colour, and grow in spikes from the extremity of the branches; after these are past, the fruit swells to the size of a Walnut, being perfectly round, having many protuberances, each having a small hole and a short tail, which extends half an inch.

This is commonly propagated by layers in *England*, but those plants which are raised from seeds, grow to be much fairer trees.

The seeds of this tree commonly remain in the ground a whole year before the plants come up, unless they are sown in the autumn; so that the surest way to raise them is, to sow the seeds in boxes or pots of light earth, which may be placed in a shady situation during the first summer, and in autumn they may be removed where they may have more sun; but if the winter should prove severe, it will be proper to cover them with Peas haulm, or other light covering, which should be taken off constantly in mild weather. The following spring if these boxes or pots are placed upon a moderate hot-bed; it will bring up the plants early; so that they will have time to get strength before winter; the first and second winters, it will be proper to screen the plants from severe frost, but afterward they will bear the cold very well.

The seeds of the second sort were sent by Mr. *Peyssonel* from the *Levant*. The leaves of this sort differ from those of the first, in having their lobes shorter and deeply sinuated on their borders; they end in blunt points, and are not serrated; but as I have not seen the fruit of this, so I do not know how it differs from the other.

LIRIODENDUM. See Tulipifera.

LITHOSPERMUM. *Tourn. Inst. R. H. 137. tab. 55.* Gromwell, Gromill, or Graymill.

The Characters are,

The flower hath one petal, with a cylindrical tube divided into five obtuse points at the brim; the chaps are perforated. It hath five short stamina, which are shut up in the chaps of the petal; and hath four germen, which afterward turn to so many oval, hard, smooth, acute pointed seeds, sitting in the spreading empalement.

The Species are,

1. LITHOSPERMUM *seminibus lævibus, corollis calycem vix superantibus, foliis lanceolatis*, Hort. Cliff. 46. Greater upright Gromwell.

2. LITHOSPERMUM *seminibus rugosis, corollis vix calycem superantibus*. Hort. Cliff. 46. Field Gromwell with a red root.

3. LITHOSPERMUM *seminibus lævibus, corollis calycem multoties superantibus*. Hort. Cliff. 46. Smaller, creeping; broad-leaved Gromwell.

4. LITHOSPERMUM *foliis subovalibus nervosis, corollis acuminatis*. Lin. Sp. Plant. 132. Broad-leaved Gromwell of *Virginia*, with a longer whitish flower.

5. LITHOSPERMUM *villifum, caulibus procumbentibus simplicissimis*. Mat. Med. Lin. 58. Alkanet.

The first sort grows naturally upon banks, and in dry fields in many parts of *England*, so is seldom admitted into gardens. This hath a perennial root, from which arise upright stalks two feet high, garnished with spear-shaped, rough, hairy leaves, placed alternate, sitting close to the stalks. The flowers come out singly at every joint of the small branches; they are white, of one petal, cut into four parts at the top, and stand within the empalement; these are each succeeded by four hard white shining seeds, which ripen in the empalement.

The second sort is an annual plant, which grows among winter Corn in many parts of *England*. This rises with a slender branching stalk a foot and a half high, garnished with narrow, spear-shaped, rough leaves placed alternately. The flowers are produced singly on the upper parts of the stalks, they are small, white, and are succeeded by four rough seeds, which ripen in the empalement.

The third sort grows naturally in woods in many parts of *England*; this has a perennial root, from which come out two or three trailing stalks scarce a foot long, garnished with narrow, spear shaped leaves, placed alternately. The flowers terminate the stalks, they are white, and the petals are much longer than the empalements.

The fourth sort grows naturally in *North America*; this hath a biennial root, from which arise several very hairy stalks about a foot and a half high, garnished with oval, rough, hairy, veined leaves, sitting close to the stalks alternately. The flowers grow in short reflexed spikes at the end of the branches; these are white, their petals being longer than the empalement, ending in acute points.

The fifth grows naturally in the south of *France*, and also in the *Levant*. This hath a biennial red root, which runs deep in the ground, from which comes a single trailing stalk a foot long, which is pretty closely set with hairs, and garnished with rough prickly leaves placed alternately. The flowers are produced in short reflexed spikes at the end of the stalk; standing in hairy empalements; they are of a reddish purple colour, but as they decay change to a deep purple.

This sort stands in the list of medicinal plants, but at present is rarely used: the bark of the root gives a fine purple tincture, for which it is sometimes used, but the colour is not permanent.

These may be cultivated by sowing their seeds soon after they are ripe, in a bed of fresh earth, allowing them at least a foot distance, keeping them clean from weeds, and they will thrive in almost any soil or situation.

LOBELIA. *Plum. Nov. Gen. 21. tab. 31.*

The Characters are,

The flower has one petal, which is tubulous, ringent, and cut into five parts at the brim. It hath five awl-shaped stamina the length of the tube, and a pointed germen under the petal, which afterward becomes an oval fleshy berry with two cells, each containing a single seed.

We have but one Species of this genus, viz.

LOBELIA *frutescens, foliis ovali oblongis integerrimis*. Flor. Zeyl. 313. Shrubby Lobelia with oblong, oval, entire leaves.

This

This plant rises with a succulent stalk, five or six feet high, garnished with oval, oblong, succulent leaves, placed alternately, which sit close to the stalk. The flowers are produced upon long foot-stalks, and sustain two or three white flowers of one petal, cut into five acute segments at the brim; these are succeeded by oval berries as large as Bullace, containing a stone with two cells, in each of these is lodged a single seed.

This plant grows naturally in many of the islands of the *West-Indies*. It is propagated by seed, which must be procured from the countries of its natural growth; these should be sown in pots, and plunged into a hot-bed of tanners bark, where the plants will come up in about five or six weeks, provided the bed is kept warm, and the earth often watered. When the plants are about two inches high, they should be carefully taken out of the pots in which they were sown, and each planted in a separate small pot, and then plunged into the hot-bed again, observing to shade them in the heat of the day until they have taken new root. In this hot-bed the plants may remain until the middle or latter end of *September*, when they must be removed into the stove, and plunged into the tan-bed, and afterward treated in the same way as other tender exotic plants, which require a stove to preserve them through the winter.

LOBUS ECHINATUS. See *Guilandina*.

LONCHITIS, Rough Spleenwort.

The Characters are,

The leaves are like those of the Fern, but the pinnulae are eared at their base; the fruit also is like that of the Fern.

The Species are,

1. LONCHITIS aspera. Ger. Rough Spleenwort.
2. LONCHITIS aspera major. Ger. Emac. Greater rough Spleenwort.

The first of these plants is very common in shady woods, by the sides of small rivulets in divers parts of *England*; but the second sort is not quite so common, and has been brought into several curious botanick gardens from the mountains in *Wales*. There are also great variety of these plants in *America*, which at present are strangers in the *European* gardens; they are seldom cultivated but in botanick gardens, for the sake of variety, where they must have a moist soil and shady situation.

LONICERA. *Lin. Gen. Plant. Tourn. Inst. R. H.* 609. tab. 379. Upright Honeyfuckle.

The Characters are,

The flower has one petal, with an oblong tube, cut into five parts at the brim, and five awl-shaped stamina. Under the petal is situated a roundish germen, which afterward turns to two berries, which join at their base.

The Species are,

1. LONICERA pedunculis bifloris baccis distinctis, foliis integerrimis pubescentibus. *Prod. Leyd.* 238. Dwarf Cherry with twin red fruit; commonly called Fly Honeyfuckle.
2. LONICERA pedunculis bifloris, baccis coadunatis didymis. *Lin. Sp. Plant.* 174. Dwarf Alpine Cherry with a red twin fruit, marked with two points; commonly called red-berried upright Honeyfuckle.
3. LONICERA pedunculis bifloris, baccis coadunatis globosis, stylis indivisis. *Lin. Sp. Plant.* 174. Mountain Dwarf Cherry with a single blue fruit; commonly called single, blue-berried, upright Honeyfuckle.
4. LONICERA pedunculis bifloris, baccis distinctis, foliis serratis. *Prod. Leyd.* 238. Alpine Dwarf Cherry with a black twin fruit; called black-berried upright Honeyfuckle.
5. LONICERA pedunculis bifloris, baccis distinctis, foliis cordatis obtusis. *Hort. Upsal.* 42. Dwarf Cherry with a twin red fruit, and smooth heart-shaped leaves.
6. LONICERA pedunculis bifloris, baccis distinctis, foliis oblongis glabris. *Lin. Sp. Plant.* 174. Pyrenan Dwarf Cherry; called Xylosteum.

7. LONICERA capitulis lateralibus pedunculatis, foliis petiolatis. *Lin. Sp. Plant.* 175. Commonly called shrubby St. Peterfwort.

The first sort has been many years cultivated in the *English* gardens under the title of Fly Honeyfuckle. It grows naturally upon the *Alps*, and in other cold parts of *Europe*. It rises with a strong woody stalk six or eight feet high, covered with a whitish bark, divided into many branches, garnished with oblong, entire, downy, oval leaves, placed opposite. The flowers come out from the side of the branches opposite, standing upon slender foot-stalks, each sustaining two irregular white flowers, which are succeeded by two red clammy berries, which are joined at their base.

The second sort grows naturally on the *Alps*; this hath a short, thick, woody stem, which divides near the root into many strong woody branches, which grow erect, garnished with spear-shaped entire leaves, placed opposite. The flowers stand upon very long slender foot-stalks, which come out opposite on each side the branches, at the base of the leaves; they are red on their outside, but pale within, shaped like those of the former sort, but are larger, and are commonly succeeded by two oval red berries, joined at their base, which have two punctures. Sometimes there is but one berry succeeding each flower, which is frequently as large as a *Kentish* Cherry; this I believe has led some to suppose it was a distinct species, as I thought myself, when I saw all the fruit upon some of the shrubs were single, but, the following years, I found they had twin fruit like the others.

The third sort grows naturally upon the *Apennines*; this is a shrub of humbler growth than either of the former, seldom rising more than four or five feet high. The branches are slender, covered with a smooth purplish bark. The joints are farther asunder, the leaves come out opposite. The foot-stalks of the flowers are very short, each sustaining two white flowers, shaped like those of the former sorts; these are succeeded by blue berries, which are single and distinct.

The fourth sort grows naturally on the *Alps* and *Helvetian* mountains; this shrub is very like the former, but the branches are slenderer. The leaves are a little sawed on their edges. The flowers have two berries succeeding them, in which consists their difference.

The fifth sort grows naturally in *Tartary*; this shrub grows about the same height with the two former, to which this has a great resemblance in its branches, but the leaves of this are heart-shaped, and the berries are red, growing sometimes single, at others double, and frequently there are three joined together, which are about the same size with the former.

The sixth sort grows naturally on the *Pyrenean* mountains, and also in *Canada*. This seldom rises more than three or four feet high, dividing into several irregular branches, garnished with oblong smooth leaves, placed opposite. The flowers come out from the side of the branches, upon slender foot-stalks, each sustaining two white flowers, which are cut into five segments almost to the bottom, and are succeeded by berries as the other sorts.

The seventh sort grows naturally in *North America*; this hath a shrubby stalk, which rises six or seven feet high, sending out many slender branches, garnished with oval hairy leaves, placed opposite, having very short foot-stalks. The flowers are produced in whorls round the stalk; they are of an herbaceous colour. The fruit, which is hollow, and shaped like a pottage pot, ripens in the winter.

These shrubs are now propagated in the nursery-gardens near *London* for sale, and are commonly intermixed with other flowering shrubs for the sake of variety; but as there

is little beauty in their flowers, a few of them only should be admitted, to set off those which are preferable; they are all of them very hardy plants, so will thrive in a cold situation, better than in a warm one; they love a moist light soil, in which they will thrive, and produce a greater quantity of fruit than in dry ground.

They may be propagated either by seeds, or cuttings. The seeds commonly lie in the ground a year before they vegetate, but require no particular culture; if they are sown in autumn, many of them will grow the following spring. The cuttings should be planted in autumn in a shady border, where they will put out roots the following spring, and in the following autumn they may be removed into a nursery, to grow two years to get strength, after which they should be transplanted where they are designed to remain.

LORANTHUS. *Vaill. Art. R. Sc. 1702. Lin. Gen. Plant. 400.*

The Characters are,

The flower is tubulous, and cut into five narrow segments, almost to the bottom, which are reflexed. It hath four stamina. The germen which is situated below the empolment, afterward becomes an oval pulpy fruit with one cell, including several compressed seeds.

There is but one Species of this genus at present known, viz.

LORANTHUS. *Lin. Sp. Plant. 331.* Branching Loranthus with a scarlet flower, and black berries.

This plant was discovered by father Plumier, in the French islands in America, and was afterward found growing naturally at La Vera Cruz, by the late Dr. Housloun: it rises with a shrubby stalk eight or ten feet high, dividing into several branches, garnished with oblong entire leaves, which have three longitudinal nerves. The flowers are produced at the end of the branches in small clusters, and are of a scarlet colour, cut into five narrow segments almost to the bottom; these are succeeded by oval berries, with a pulp covering a hard shell with one cell, inclosing several compressed seeds.

This plant is propagated by seeds, which should be sown as soon as they are ripe, for if they are kept out of the ground long, they often miscarry; or if they do grow, it is not till the year after, so that those seeds which come from America, very seldom grow the first year; therefore they should be sown in pots, and kept in a moderate hot-bed the first summer, and in autumn removed into the stove, where, if the pots are plunged in the tan-bed between the plants, and the earth kept moist, in the spring they may be taken out, and plunged into a moderate fresh hot-bed, which will bring up the plants, which must be planted in separate small pots, and kept in the bark-stove, treating them in the same way as other tender plants from the same country.

LOTUS. *Tourn. Inst. R. H. 402.* Birds-foot Trefoil.

The Characters are,

The flower is of the butterfly kind. The standard is roundish, and reflexed backward. The wings are broad, and shorter than the standard, closing together at the top. The keel is closed on the upper side, and convex on the under. It hath ten stamina, nine joined and one separate, with an oblong taper germen, which afterward becomes a close cylindrical pod with one cell, opening with two valves, having many transverse partitions, in each of these is lodged one roundish seed.

The Species are,

1. LOTUS capitulis depressis, caulibus decumbentibus, leguminibus cylindricis. *Lin. Sp. Plant. 775.* Lesser smooth corniculated Birds-foot Trefoil.

2. LOTUS leguminibus subbinatis linearibus striatis erectis, caule erecto, pedunculis alternis. *Lin. Sp. Plant. 774.* Smaller, five-leaved, hairy Birds-foot Trefoil, with very narrow pods.

3. LOTUS capitulis depressis, caulibus decumbentibus, foliis linearibus glabris, leguminibus linearibus. Birds-foot Trefoil with depressed heads, trailing stalks, smooth linear leaves, and very narrow pods.

4. LOTUS capitulis subglobosis, caule erecto, leguminibus rectis glabris. *Hort. Upsal. 221.* Tallest hairy Birds-foot Trefoil with a glomerated flower.

5. LOTUS capitulis dimidiatis, caule fruticoso, foliis nitidis. *Hort. Cliff. 372.* Silvery Birds-foot Trefoil of Crete.

6. LOTUS capitulis hirsutis, caule erecto hirsuto, leguminibus ovatis. *Hort. Upsal. 220.* Birds-foot Trefoil with hairy heads, an erect hairy stalk, and oval pods.

7. LOTUS capitulis subglobosis hirsutis, caule erecto ramoso, hirsuto, foliis tomentosis. Birds-foot Trefoil with globular heads which are hairy, an upright, branching, hairy stalk, and woolly leaves.

8. LOTUS leguminibus subquinatis arcuatis compressis, caulibus diffusis. *Hort. Cliff. 372.* Birds foot Trefoil with five arched compressed pods, and diffused stalks.

9. LOTUS leguminibus subbinatis linearibus compressis nudentibus. *Hort. Cliff. 372.* Birds-foot Trefoil with two narrow, compressed, nodding pods.

10. LOTUS leguminibus solitariis erectis teretibus terminalibus, caule erecto. *Sauv. Monsp. 189.* Yellow meadow Birds-foot Trefoil.

11. LOTUS leguminibus solitariis gibbis incurvis. *Hort. Cliff. 370.* Birds-foot Trefoil with single, convex, incurved pods.

12. LOTUS leguminibus solitariis membranaceo-quadrangulatis, bracteis lanceolatis. *Flor. Suec. 610.* Yellow maritime Birds-foot Trefoil with a smooth leaf.

13. LOTUS leguminibus conjugatis membranaceo-quadrangulis, bracteis oblongo-ovatis. *Lin. Sp. Plant. 774.* Yellow Birds-foot Trefoil with angular pods.

14. LOTUS leguminibus solitariis membranaceo-quadrangulatis, bracteis ovatis. *Hort. Upsal. 220.* Red Birds-foot Trefoil with angular pods; commonly called winged Pea.

15. LOTUS capitulis dimidiatis, caule diffuso ramosissimo, foliis tomentosis. *Prod. Leyd. 387.* Podded, yellow, maritime Birds-foot Trefoil, with the appearance of Cytisus.

16. LOTUS leguminibus subternatis, caule herbaceo erecto, foliis linearibus. *Hort. Cliff. 372.* Narrow-leaved Birds-foot Trefoil of St. James's island, with a yellow purplish flower.

17. LOTUS capitulis aphyllis, foliis sessilibus quinatis. *Lin. Sp. Plant. 776.* Dorycnium of Montpellier.

The first, second, and third sorts grow naturally in many parts of England, so are rarely admitted into gardens. When these grow in moist land and a shady situation, they send out stalks near two feet long, but upon dry chalky and gravelly ground, their stalks are not more than three or four inches, and lie flat upon the ground. I have always observed in those pastures where these plants have grown, that the cattle of all sorts have avoided eating them, but the Grass all round them has been eaten very bare. I have cut the plants when young, and given it to various kinds of animals, but could never get them to eat it; and yet the seeds of these have been gathered and sold by some quacks in husbandry, under the title of Lady's Finger Grass, to be sown as an improvement to land for pasture.

The roots of these are perennial, so are difficult to get out when they have had long possession of the land, for they produce great quantities of seeds, which is cast about by the elasticity of the pods when ripe, to a considerable distance.

The fourth sort grows naturally in the south of France, in Italy and Sicily; this has by some been supposed the Cytisus of Virgil, but without foundation; it hath a strong perennial

perennial root, from which arise many upright strong stalks from five to six feet high, garnished at every joint by a trifoliate leaf, whose lobes are wedge-shaped; at the base of the foot-stalk are placed two heart-shaped lobes sitting close to the branch; the leaves are hairy on their under side; the flowers are produced at the end of the branches almost in globular heads, sitting close to the foot-stalk: they are of a pale flesh colour, and are succeeded by smooth straight pods almost an inch long, which change to a brown colour when ripe, and contain several roundish seeds. It is rarely cultivated but in botanick gardens for variety, but if any person has an inclination to cultivate this plant for feeding of cattle, it may be done in the same way as the Lucern, for which there is full directions in the article *MEDICAGO*.

The fifth sort grows naturally in *Syria* and *Crete*; this rises with slender stalks which require support, from three to four feet high, sending out a few side branches, garnished at each joint with neat, shining, silvery, leaves which are trifoliate, and have two appendages at the base of their foot-stalks. The foot-stalks of the flowers, which are from two to three inches long, arise from the side of the branches, and sustain heads of yellow flowers, which part in the middle, each head containing four or six flowers, which are succeeded by long taper pods filled with roundish seeds, which ripen in the autumn.

This sort has a perennial stalk, but is too tender to live in the open air in *England*, except the winter proves very mild, so is kept in pots and removed into the green-house in autumn, and treated like other hardy exotic plants, which only require protection from frost. It is propagated by seeds, which, if sown on a bed of light earth in *April*, the plants will come up in about a month after, and in another month will be fit to remove, when they should be each put into a separate small pot, placing them in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till autumn.

It may be also propagated by cuttings, which may be planted during any of the summer months, upon a bed of light earth, covering them close with a bell or hand-glass, and screening them from the sun; in about five or six weeks they will have taken root, when they must be inured to bear the open air, and soon after may be planted in pots, and treated in the same way as the seedling plants.

The sixth sort grows naturally in the south of *France* and *Italy*; this hath a perennial hairy stalk, which rises three feet high, and divides into several branches, garnished with hoary trifoliate leaves, having two appendages at the base of the stalk; the flowers are collected into heads sitting upon pretty long foot-stalks, which come out of the side of the stalks. They are of a dirty white colour, with a few marks of pale red, and are succeeded by short thick pods of a Chestnut colour, containing several roundish seeds which ripen in the autumn. This is propagated by seeds in the same way as the last sort; the plants will live in the open air in moderate winters, but it will be proper to keep one or two plants in pots to be sheltered, lest those abroad should be destroyed by severe frost.

The seventh sort grows naturally in *Sicily*; this rises with an upright woody stalk near three feet high, garnished with leaves like the sixth, but much whiter, covered with a short woolly down; the flowers grow in close heads like the last, they are whiter, and are succeeded by short pods, which contain many yellow seeds. This is too tender to live in the open air in *England* through the winter, so the plants must be kept in pots and housed in autumn. It is propagated in the same way as the fifth sort, and requires the same culture.

The eighth sort grows naturally in *Sicily*; this is an annual plant, which sends out from the root many stiff stalks

from one to two feet high, garnished with trifoliate leaves, having two appendages at their base; the foot-stalks of the flower rise from the wings of the stalks, which are terminated by a cluster of yellow flowers, succeeded by flat pods two inches long, bent like an arch, and have many joints, separating the cells in which the seeds are lodged.

This is propagated by seeds, which should be sown early in *April*, upon an open bed or border exposed to the sun, where the plants are to remain: when they come up they must be thinned, leaving them near two feet asunder, and kept clean from weeds, which is all the culture they require.

The ninth sort grows naturally in *Spain* and *Portugal*; this is an annual plant like the former, but doth not branch so much, the small leaves are rounder and smoother; the foot-stalks are shorter, and seldom sustain more than two flowers, these are succeeded by two very narrow pods, which hang downward.

The tenth sort grows naturally in the south of *France*; this hath a perennial root, from which is sent out several hairy stalks near a foot long, garnished with trifoliate hairy leaves standing upon short foot-stalks, with two appendages at the base of the foot-stalk; the flowers stand upon pretty long foot-stalks singly, which rise from the end of the branches. The flowers are yellow, standing erect, and are succeeded by taper erect pods an inch and a half long. It is propagated by seeds, which should be sown where the plants are to remain, and must be treated as the two former sorts, but the roots of this will continue several years.

The eleventh sort grows naturally in *Sicily* and *Crete*, where the pods are eaten by the poorer inhabitants when they are young. It also grows about *Nice*. This is an annual plant, from whose roots come out several trailing stalks a foot long, garnished at each joint with trifoliate roundish leaves having appendages. The flowers stand singly upon long foot-stalks, which arise from the side of the branches; they are yellow, small, and are succeeded by single pods which are thick, and arched with a deep furrow on the outside. In cold summers the seeds will not ripen here. This must have the same culture as the annual sorts before-mentioned.

The twelfth sort grows near the borders of the sea in *France*, *Spain*, and *Italy*; this hath a perennial root, sending out many slender stalks about a foot and a half long, which trail upon the ground, garnished with trifoliate leaves, which are smooth, and have two appendages to the base of the foot-stalk. The flowers stand singly upon very long foot-stalks, arising from the wings of the stalk; they are yellow, and are succeeded by single pods near two inches long, having four leafy membranes running longitudinally at the four corners. It is propagated by seed in the same way as the tenth sort.

The thirteenth sort grows naturally in the south of *France* and in *Italy*; this is an annual plant, from whose roots are sent forth several branching stalks a foot long, garnished with trifoliate leaves, whose lobes are acute-pointed, and have two oblong oval appendages at the base of their foot-stalks; the foot-stalks of the flowers arise from the wings of the branches, each sustaining two yellow flowers, which are succeeded by taper pods, having four leafy membranes running longitudinally their length. It is propagated by seeds, in the same way as the annual sorts before-mentioned.

The fourteenth sort grows naturally in *Sicily*, but has been long cultivated in the *English* gardens; it was formerly cultivated as an esculent plant. The green pods of it were dressed and eaten as Peas, which the inhabitants of some of the northern counties still continue, but they are very coarse, so not agreeable to the taste of those who have been accustomed to better fare.

It is an annual plant, which is cultivated in the flower-gardens near *London* for ornament. This sends out from the root several decumbent stalks about a foot long, garnished with trifoliate oval leaves, with two appendages at the base of their foot-stalks; from each joint arise alternately the foot-stalks of the flowers, each sustaining one large red flower at the top, with three leaves just under the flower. After the flower fades, the germen becomes a swelling taper pod, having four leafy membranes or wings running longitudinally.

The seeds of this sort are commonly sown in patches, five or six seeds being sown near each other, in the borders of the pleasure-garden, where they are designed to remain. If the seeds do all grow, some of the plants may be pulled up, leaving only two or three in each patch; afterward they will require no other care but to keep them clean from weeds.

The fifteenth sort grows near the borders of the sea, in the south of *France* and *Spain*. This is a perennial plant, sending out from the root many stalks, garnished with roundish trifoliate leaves with two appendages, covered with a woolly down; the flowers stand upon short foot-stalks, four or six growing in a divided head; they are yellow, and are succeeded by taper pods filled with roundish seeds. This is propagated by seeds, which should be sown in the spring in the place where the plants are to remain, and must be treated in the same manner as the hardy perennial sorts before-mentioned.

The sixteenth sort grows naturally in the island of *St. James*. This has a slender stalk, which is woody, rising from two to three feet high, sending out many slender herbaceous branches, garnished with narrow gray leaves, which are sometimes trifoliate, and at others there are five narrow lobes to each; these sit close to the branches. The flowers are produced from the side of the stalks towards their end, upon very slender foot-stalks, each sustaining four or five flowers collected in a head of a yellowish deep purple colour, which are succeeded by taper slender pods little more than an inch long, containing five or six small roundish seeds. It is too tender to live abroad in *England*, so the plants must be kept in pots, and in the winter placed in a warm airy glass-case, but in the summer they should be placed abroad in a sheltered situation. It may be easily propagated by cuttings during the summer season, in the same way as the fifth sort, and also by seeds; but the plants which have been two or three times propagated by cuttings, seldom are fruitful.

The seventeenth sort grows naturally about *Montpelier*. It rises with weak shrubby stalks three or four feet high, sending out many slender branches, which are thinly garnished with small hoary leaves, composed of five lobes in form of a hand, which sit close to the branches. The flowers are produced at the extremity of the branches in small heads; they are very small, so make no great appearance, and are succeeded by short pods, containing two or three small round seeds. This shrub will live in the open air, if it is planted in a dry soil and a warm situation. It is propagated by seeds, which will come up in any common border.

LOTUS ARBOR. See *Celtis*.

LOVE-APPLE. See *Lycopersicon*.

LUDVIGIA. *Lin. Gen. Plant.* 142.

The Characters are,

The flower consists of four spear-shaped petals, which are equal. In the center of the flower is situated four stamina. The germen, which sits under the flower, afterward becomes a four-cornered fruit, crowned with the empalement, and has four cells, which are full of small seeds.

We have but one Species of this genus in the *English* gardens at present, which is,

LUDVIGIA foliis alternis lanceolatis. *Lin. Sp. Plant.* 118. Ludvigia with alternate spear-shaped leaves.

We have no *English* name for this plant, but it is very near akin to the *Onagra*, or *Tree Primrose*.

This plant grows naturally in *South America*. It is annual, and rises with an upright branching stalk a foot high, garnished with spear-shaped leaves placed alternate. The flowers come out singly at the foot-stalks of the leaves; they are composed of four small yellow petals, standing upon short foot-stalks, and are succeeded by roundish seed-vessels with four leafy membranes; they open in four cells, including many small seeds.

The plants must be raised in a hot-bed in the spring, and treated in the same manner as hath been directed for the *Amaranthus*; for if they are not brought forward in the spring, they seldom produce good seeds in *England*.

LUFFA. See *Momordica*.

LUNARIA. *Tourn. Inst. R. H.* 218. tab. Gen. 105. Sattin-flower, or *Honesty*.

The Characters are,

The flower has four petals, placed in form of a cross, which are entire. It hath six awl-shaped stamina; four of these are the length of the empalement, the other two are shorter; and an oblong oval germen, which afterward becomes an erect, plain, compressed, elliptical pod, sitting upon a small foot-stalk, terminated by the style, having two cells opening with two valves, which are parallel, inclosing several compressed kidney-shaped seeds, which are bordered, sitting in the middle of the pod.

The Species are,

1. LUNARIA filiculis oblongis. *Lin. Sp. Plant.* 653. Sattin-flower with oblong pods.

2. LUNARIA filiculis subrotundis. *Lin. Sp. Plant.* 653. Sattin-flower with a rounder pod.

3. LUNARIA foliis supra decompositis, foliolis trifidis, filiculis oblongis pendulis. Moonwort with leaves decomposed, whose lobes are trifid, and oblong hanging pods.

4. LUNARIA perennis, filiculis oblongis, foliis lanceolatis incanis. Perennial Moonwort with oblong pods, and spear-shaped hoary leaves.

The first sort grows naturally in *Hungary*, *Isiria*, and *Austria*. It is a biennial plant, which perishes soon after the seeds are ripe; it rises with a branching stalk from two to three feet high, covered with a reddish hairy bark, sending out branches on every side from the ground upward, garnished with heart-shaped leaves placed alternately, ending in acute points. The flowers terminate the branches in clusters; they are composed of four purplish heart-shaped petals, placed in form of a cross. These are succeeded by large, flat, roundish pods with two cells, inclosing two rows of flat kidney-shaped seeds, which have a border round them. These pods, when ripe, turn to a clear white or fawn colour, and are transparent.

This is propagated by seeds, which should be sown in the autumn, for those which are sown in the spring often miscarry, or lie a long time in the ground. The plants will grow in almost any soil, but love a shady situation. They require no other culture, but to keep them clean from weeds. If the seeds are permitted to scatter, the plants will rise without any further care; and if they are left unre-moved, they will grow much larger than those which are transplanted.

The second sort grows naturally upon the mountains in *Italy*. This hath stalks and leaves very like the first, but the flowers are rather larger, and of a lighter purple colour; but the principal difference is in the pods of this being longer and narrower than those of the other; it requires the same culture.

The third sort is an annual plant, which grows naturally in *Egypt*. This rises with a smooth branching stalk a foot high, garnished with winged leaves, composed of several pair of lobes ranged along the midrib, terminated by an

odd one; these lobes are of unequal sizes, and vary in their form; some of them are almost entire, and others are cut at their extremities into three parts; they are smooth, and of a lucid green. The flowers stand upon pretty long slender foot-stalks, which come out from the side, and at the end of the branches, in loose small clusters; they are of a purple colour, and are succeeded by oblong compressed pods, which hang downward.

This is propagated by seeds, which should be sown upon an open border where the plants are to remain; if they are sown soon after they are ripe, the plants will come up in the autumn, and live through the winter without shelter, and these will flower early the following summer. When the plants come up, they will require no other care, but to keep them clean from weeds, and thin them where they are too close. If the seeds are permitted to scatter in the autumn, the plants will rise without care, and may be treated in the same way.

The fourth sort grows naturally in the *Archipelago*. This is biennial; the stalks rise a foot high, covered with a white hairy bark, garnished with spear-shaped hoary leaves fitting close to the branches. The branches are terminated by loose spikes of yellow flowers, which are succeeded by oblong flat pods, containing flat kidney-shaped seeds, which ripen in the autumn.

This sort is propagated by seeds, which, if sown in the autumn, will succeed better than in the spring; they should be sown on a warm border and a dry poor soil, otherwise they will not live through the winter, but in a rubbishing soil the plants will do best.

LUPINUS. *Tourn. Inst. R. H.* 392. *tab.* 213. Lupine.

The Characters are,

The flower is of the butterfly kind; the standard is roundish, heart-shaped, the sides reflexed and compressed. The wings are nearly oval, and close at their base; the keel is narrow, falcated, and ends in a point. It hath ten stamina joined at their base in two bodies, but are distinct above. In the center is situated a hairy compressed germen, which after-ward becomes a large, oblong, thick-shelled pod with one cell, ending with an acute point, including several roundish compressed seeds.

The Species are,

1. LUPINUS *calycibus semiverticillatis appendiculatis, labio superiore bifido, inferiore subtridentato. Hort. Cliff.* 499. Wild Lupine, with a purple flower and a round variegated seed; commonly called the lesser blue Lupine

2. LUPINUS *calycibus alternis appendiculatis, labio superiore bipartito integro. Lin. Sp. Plant.* 721. Narrow-leaved, taller, blue Lupine.

3. LUPINUS *calycibus verticillatis appendiculatis, labio superiore bipartito, inferiore tridentato. Hort. Cliff.* 499. The common yellow Lupine.

4. LUPINUS *calycibus verticillatis appendiculatis, labio superiore inferioque integris. Hort. Cliff.* 499. Foreign, greater, hairy Lupine, with a large blue flower; commonly called the great blue Lupine.

5. LUPINUS *calycibus alternis inappendiculatis, labio superiore integro, inferiore tridentato. Hort. Cliff.* 499. Garden or manured Lupine, with a white flower.

6. LUPINUS *calycibus alternis inappendiculatis, labio superiore emarginato, inferiore integro. Lin. Sp. Plant.* 721. Smaller, perennial, creeping, blue Lupine of *Virginia*.

The first sort grows naturally among the Corn in the south of *France* and *Italy*, and in great abundance in *Sicily*. This is an annual plant, which rises with a firm, strait, channelled stalk near three feet high, divided toward the top into several branches, garnished with hand-shaped leaves, composed of five, six, or seven oblong lobes, which join in one center at their base. The flowers are produced in spikes at the end of the branches, standing half round the stalk in

a sort of whorl; they are of a light blue colour, and are succeeded by strait taper pods with one cell, inclosing a row of roundish seeds.

It is propagated in the borders of the pleasure-garden for ornament, by sowing the seeds in *April* in the places where they are to remain; and when the plants come up, they should be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The second sort has much the appearance of the first, but the stalks rise higher; the leaves have more lobes, and stand upon longer foot-stalks; the lobes are blunt-pointed, and the seeds are variegated. This requires the same culture as the first, and flowers at the same time.

The third sort is the common yellow Lupine; this grows naturally in *Sicily*. It rises about a foot high, with a branching stalk, garnished with hand-shaped leaves, composed of nine narrow hairy lobes, which join at their base to the foot-stalks. The flowers are yellow, and are produced in loose spikes at the end of the branches, standing in whorls round the stalks. These are succeeded by flattish hairy pods about two inches long, inclosing four or five roundish seeds, a little compressed on their side. This sort flowers at the same time as the former; but to have a succession of the flowers, the seeds are sown at different times, *viz.* in *April*, *May*, and *June*, but those only which are first sown, will ripen their seeds. It may be cultivated in the same manner as the two former, and is equally hardy.

The fourth sort is supposed to be a native of *India*. It is an annual plant, which rises with a strong, firm, channelled stalk, from three to four feet high, covered with a soft brownish down, dividing upward into several strong branches, garnished with hand-shaped leaves, composed of nine, ten, or eleven wedge shaped hairy lobes, which are narrow at their base, where they join the foot stalk. The flowers are placed in whorls round the stalks above each other, forming a loose spike at the end of the branches; they are large, and of a beautiful blue colour, but have no scent. The pods of this sort are large, almost an inch broad and three inches long, inclosing three large roundish seeds compressed on their sides, very rough, and of a purplish brown colour. There is a variety of this with flesh coloured flowers, which is commonly called the Rose Lupine; it differs from the blue only in the colour of the flower, but this difference is permanent, for neither of the sorts vary.

This is generally late in the ripening of the seeds, so that unless the autumn proves warm and dry, they do not ripen well in *England*; therefore the best way to have good seeds, is to sow them in *September*, close to a warm wall on dry ground, where they will live through our ordinary winters; and these plants will flower early the following summer, so there will be time for the seeds to ripen before the rains fall in the autumn, which frequently causes the seeds to rot which are not ripe.

The fifth sort grows naturally in the *Levant*, but is cultivated in some parts of *Italy*, as other pulse for food. This hath a thick upright stalk about two feet high, which divides toward the top into smaller branches, garnished with hand-shaped leaves, composed of seven or eight narrow, oblong, hairy lobes, which join at their base, of a dark grayish colour, with a silvery down. The flowers are produced in loose spikes at the end of the branches; they are white, and sit close to the stalk, and are succeeded by hairy strait pods about three inches long, a little compressed on the sides, which contain five or six flattish white seeds, having a little cavity like a navel, in that part which is fixed to the pod. This is an annual plant, which is cultivated for ornament in the pleasure-garden. The seeds must be sown in the places where the plants are to remain, and may be treated in the same way as the first sort.

The sixth sort grows naturally in *Virginia*, and other of the northern parts of *America*. It hath a perennial creeping root, from which arise several erect channelled stalks a foot and a half high, garnished with hand-shaped leaves, composed of ten or eleven spear-shaped lobes, which join at their base. The flowers grow in long loose spikes, which terminate the stalks, and are placed without order on every side the stalk; they are of a pale blue colour, and are succeeded by pods, having three or four seeds, which ripen in *August*, and are soon scattered if they be not gathered; for after a little moisture, the sun causes the pods to open with an elasticity, and cast out the seeds to a distance. This sort is propagated by seeds as the former; which should be sown where the plants are to remain; for although the root is perennial, yet it runs so deep into the ground, as that it cannot be taken up entire; and if the root is cut or broken, the plant never thrives well after. I have traced some of the roots of this plant, which have been three feet deep in the ground in one year from seed; they also spread out far on every side, so that they must have room, therefore the young plants should not be left nearer than three feet asunder.

LUPULUS. *Tourn. Inst. R. H. 535. tab. 309.* The Hop.

The Characters are,

It has male and female flowers upon different plants. The male flower hath no petal, but has five short hairy stamina. The female flowers have neither petal or stamina, but a small germen situated in the center, which afterward turns to a roundish seed covered with a thick skin, inclosed in the base of the empalement.

We have but one Species of this genus, viz.

LUPULUS mas & femina. C. B. P. 298. Male and female Hop.

The male Hop grows wild by the side of hedges and upon banks, in many parts of *England*. The young shoots of these plants are often gathered by the poor people, and boiled as an esculent herb; but these must be taken very young, otherwise they are tough and stringy. This is easily distinguished by the flowers, which are small, and hang in long loose bunches from the side of the stalks, abounding with farina on their summits, and have no Hops succeeding to the flowers.

The female Hop is the sort which is cultivated for use; of this sort, the people who cultivate them reckon three different varieties: as first, the long and square Garlick Hop, the long white Hop, and the oval Hop, all which are indifferently cultivated in *England*.

There being the greatest plantation of Hops in *Kent* of any county in *England*, it is very probable, that their method of planting and ordering them should be the best.

As for the choice of their Hop-grounds, they esteem the richest and strongest grounds as the most proper; and if it be rocky within two or three feet of the surface, the Hops will prosper well; but they will by no means thrive on a stiff clay, or spongy wet land.

The *Kentish* planters account new land best for Hops; they plant their Hop-gardens with Apple trees at a large distance, and with Cherry trees between; and when the land hath done its best for Hops, which they reckon it will in about ten years, the trees may begin to bear. The Cherry trees last about thirty years, and by that time the Apple trees are large, they cut down the Cherry trees.

As to the situation of a Hop-ground, one that inclines to the south or west is the most eligible, but if it be exposed to the north-east or south-west winds, there should be a shelter of some trees at a distance, because the north-east winds are apt to nip the tender shoots in the spring, and the south-west winds frequently break and blow down the poles at the latter end of the summer, and very much endanger the Hops.

Hops require to be planted in a situation so open, as that the

air may freely pass round and between them, to dry up and dissipate the moisture, whereby they will not be so subject to fire-blasts, which often destroy the middles of large plantations, while the outsides remain unhurt.

As for the preparation of the ground for planting, it should, the autumn before, be ploughed and harrowed even, and then lay upon it in heaps a good quantity of fresh rich earth, or well rotted dung and earth mixed together, sufficient to put half a bushel in every hole to plant the Hops in, unless the natural ground be very fresh and good.

The hills where the Hops are to be planted, should be ten feet asunder, that the air may freely pass between them; for in close plantations, they are very subject to what the Hop-planters call the fire-blast.

If the ground is intended to be ploughed with horses between the hills, it will be best to plant them in squares checquerwise; but if the ground is so small, that it may be done with the breast-plough or spade, the holes should be ranged in a quincunx form. Which way soever you make use of, a stake should be stuck down at all the places where the hills are to be made.

Persons ought to be very curious in the choice of the plants, as to the kind of Hop; for if the Hop-garden be planted with a mixture of several sorts of Hops that ripen at several times, it will cause a great deal of trouble, and be a great detriment to the owner.

The two best sorts are the white and the gray bind; the latter is a large square Hop, more hardy, and is the more plentiful bearer, and ripens later than the former.

There is also another sort of the white bind, which ripens a week or ten days before the common; but this is tenderer and a less plentiful bearer, but it has this advantage, it comes first to market.

But if three grounds, or three distant parts of one ground, be planted with these three sorts, there will be this conveniency, that they may be picked successively as they become ripe.

If there be a sort of Hop you value, and would increase plants and sets from, the superfluous binds may be laid down when the Hops are tied, cutting off the tops, and burying them in the hill; or when the Hops are dressed, all the cuttings may be saved; for almost every part will grow, and become a good set the next spring.

As to the seasons of planting Hops, the *Kentish* planters best approve the months of *October* and *March*, both which sometimes succeed very well; but the sets are not to be had in *October*, unless from some ground that is to be destroyed; and likewise there is some danger that the sets may be rotted, if the winter prove very wet; therefore the most usual time of procuring them is in *March*, when the Hops are cut and dressed.

As to the manner of planting the sets, there should be five good sets planted in every hill, one in the middle, and the rest round about sloping, the tops meeting at the center; they must stand even with the surface of the ground; let them be pressed close with the hand, and covered with fine earth, and a stick should be placed on each side the hill to secure it.

The ground being thus planted, all that is to be done more that summer, is to keep the hills clear from weeds, and to dig up the ground about the month of *May*, and to raise a small hill round about the plants; in *June* you must twist the young binds or branches together into a bunch or knot; for if they are tied up to small poles the first year, in order to have a few Hops from them, it will not countervail the weakening of the plants.

A mixture of compost or dung being prepared for your Hop-ground, the best time for laying it on, if the weather prove dry, is about *Michaelmas*, that the wheels of the dung-

cart may not injure the Hops, nor furrow the ground: if this be not done then, you must be obliged to wait till the frost has hardened the ground, so as to bear the dung-cart; and this is also the time to carry on your new poles, to recruit those that are decayed, and to be cast out every year.

If you have good store of dung, the best way will be to spread it in the alleys all over the ground, and to dig it in the winter following. The quantity they will require, will be forty loads to an acre, reckoning about thirty bushels to the load.

If you have not dung enough to cover all the ground in one year, you may lay it on one part one year, and on the rest in another, or a third; for there is no occasion to dung the ground after this manner, oftener than once in three years.

Those who have but a small quantity of dung, usually content themselves with laying on about twenty loads upon an acre every year; this they lay only on the hills, either about *November*, or in the spring; which last some account the best time, when the Hops are dressed, to cover them after they are cut; but if it be done at this time, the compost or dung ought to be very well rotted and fine.

As to the dressing of the Hops, when the Hop-ground is dug in *February* or *March*, the earth about the hills, and very near them, ought to be taken away with a spade, that you may come the more conveniently at the stock to cut it.

About the end of *February*, if the Hops were planted the spring before, or if the ground be weak, they ought to be dressed in dry weather; but else, if the ground be strong and in perfection, the middle of *March* will be a good time; and the latter end of *March*, if it be apt to produce over-rank binds, may be soon enough.

Then having with an iron picker cleared away all the earth out of the hills, so as to clear the stock to the principal roots, with a sharp knife you must cut off all the shoots which grew up with the binds the last year; and also all the young suckers, that none be left to run in the alley and weaken the hill. It will be proper to cut one part of the stock lower than the other, and also to cut that part low that was left highest the preceding year. By pursuing this method, you may expect to have stronger buds, and also keep the hill in good order.

In dressing those Hops that have been planted the year before, you ought to cut off both the dead tops, and the young suckers, which have sprung up from the sets, and also to cover the stocks with fine earth a finger's length in thickness.

About the middle of *April* the Hops are to be poled, when the shoots begin to sprout up; the poles must be set to the hills deep into the ground, with a square iron picker or crow, that they may the better endure the winds; three poles are sufficient for one hill. These should be placed as near the hills as may be, with their bending tops turned outwards from the hill, to prevent the binds from entangling; and a space between two poles ought to be left open to the south, to admit the sun beams.

The poles ought to be in length sixteen or twenty feet, more or less, according as the ground is in strength; and great care is to be taken not to overpole a young or weak ground, for that will draw the stock too much, and weaken it. If a ground be overpoled, you are not to expect a good crop from it; for the branches, which bear the Hops, will grow very little, till the binds have over-reached the poles, which they cannot do when the poles are too long. Two small poles are sufficient for a ground that is young.

If you wait till the sprouts or young binds are grown to the length of a foot, you will be able to make a better judgment where to place the largest poles; but if you stay till they are so long as to fall into the alleys, it will be in-

jurious to them, because they will entangle one with another, and will not clasp about the pole readily.

Maple or Aspen poles are accounted the best for Hops, on which they are thought to prosper best, because of their warmth; or else, because the climbing of the Hop is furthered by means of the roughness of the bark. But for lastingness, Ashen or Willow poles are preferable; but Chestnut poles are the most durable of all.

If after the Hops are grown up, you find any of them have been under-poled, taller poles may be placed near those that are too short, to receive the binds from them.

As to the tying of Hops, the buds that do not clasp of themselves to the nearest pole when they are grown to three or four feet high, must be guided to it by the hand, turning them to the sun, whose course they will always follow. They must be bound with withered Rushes, but not so close as to hinder them from climbing up the pole.

This you must continue to do till all the poles are furnished with binds, of which two or three are enough for a pole; and all the sprouts and binds that you have no occasion for, are to be plucked up; but if the ground be young, then none of these useless binds should be plucked up, but should be wrapt up together in the middle of the hill.

When the binds are grown beyond the reach of your hands, if they forsake the poles, you should make use of a stand-ladder in tying them up.

Towards the latter end of *May*, when you have made an end of tying them, the ground must have the summer dressing: this is done by casting up with the spade some fine earth into every hill; and a month after this is done, you must hoe the alleys with a *Dutch* hoe, and make the hills up to a convenient bigness.

When the Hops blow, you should observe if there be any wild barren hills among them, and mark them, by driving a sharpened stick into every such hill, that they may be digged up and replanted.

Hops, as well as other vegetables, are liable to distempers and disasters, and among the rest to the fen.

The Rev. Dr. *Hales*, in his excellent treatise of *Vegetable Staticks*, treating of Hops, gives us the following account of the state of Hops in *Kent*, in the year 1725, that he received from Mr. *Austen* of *Canterbury*, which is as follows:

In mid *April* not half the shoots appeared above ground, so that the planters knew not how to pole them to the best advantage.

This defect of the shoot, upon opening the hills, was found to be owing to the multitude and variety of vermin that lay preying upon the roots; the increase of which, was imputed to the long and almost uninterrupted series of dry weather for three months before. Towards the end of *April*, many of the Hop vines were infested with flies.

About the 20th of *May* there was a very unequal appearance, some vines being run seven feet, others not above three or four; some just tied to the poles, and some not visible; and this disproportionate inequality in their size, continued through the whole time of their growth.

The flies now appeared upon the leaves of the forwardest vines, but not in such numbers here, as they did in most other places. About the middle of *June* the flies increased, yet not so as to endanger the crop; but in distant plantations they were exceedingly multiplied, so as to swarm towards the end of the month.

June the 27th some specks of fen appeared. From this day to the 9th of *July* was very dry weather. At this time, when it was said that the Hops in most parts of the kingdom looked black and sickly, and seemed past recovery, ours held it out pretty well, in the opinion of the most skilful planters.

The great leaves were indeed discoloured, and a little withered, and the fen was somewhat increased. From the 9th of *July* to the 23d, the fen increased a great deal; but the flies and lice decreased, it raining much daily. In a week more the fen, which seemed to be almost at a stand, was considerably increased, especially in those grounds where it first appeared.

About the middle of *August* the vines had done growing both in stem and branch, and the forwardest began to be in the Hop, the rest in bloom; the fen continued spreading where it was not before perceived; and not only the leaves, but many of the burs were also tainted with it.

About the 20th of *August* some of the Hops were infected with the fen, and whole branches corrupted by it. Half the plantations had pretty well escaped hitherto, and from this time the fen increased but little; but several days wind and rain the following week so distorted them, that many of them began to dwindle, and at last came to nothing; and of those that then remained in bloom, some never turned to Hops; and of the rest which did, many of them were so small, that they very little exceeded the bigness of a good thriving bur.

We did not begin to pick till the 8th of *September*, which is eighteen days later than we began the year before; the crop was little above two hundred on an acre round, and not good. The best Hops sold this year at *Way-hill*, for 16*l.* the hundred.

About the middle of *July* Hops begin to blow, and will be ready to gather about *Bartholomew Tide*. A judgment may be made of their ripeness, by their strong scent, their hardness, and the brownish colour of their seed.

When by these tokens they appear to be ripe, they must be picked with all the expedition possible; for if at this time a storm of wind should come, it would do them great damage, by breaking the branches, and bruising and discolouring the Hops; and it is very well known that Hops, being picked green and bright, will sell for a third part more than those which are discoloured and brown.

The most convenient way of picking them is into a long square frame of wood, called a bin, with a cloth hanging on tenter-hooks within it, to receive the Hops as they are picked.

The frame is composed of four pieces of wood joined together, supported by four legs, with a prop at each end to bear up another long piece of wood, placed at a convenient height over the middle of the bin; this serves to lay the poles upon, which are to be picked.

This bin is commonly eight feet long, and three feet broad; two poles may be laid on it at a time, and six or eight persons may work at it, three or four on each side.

It will be best to begin to pick the Hops on the east or north side of your ground, if you can do it conveniently; this will prevent the south-west wind from breaking into the garden.

Having made choice of a plot of the ground containing eleven hills square, place the bin upon the hill, which is in the center, having five hills on each side; and when these hills are picked, remove the bin into another piece of ground of the same extent, and so proceed till the whole Hop-ground is finished.

When the poles are drawn up to be picked, you must take great care not to cut the binds too near the hills, especially when the Hops are green, because it will make the sap to flow excessively.

The Hops must be picked very clean, *i. e.* free from leaves and stalks; and, as there shall be occasion, two or three times in a day the bin must be emptied into a hop-bag made of coarse linen cloth, and carried immediately to the oast or kiln, in order to be dried; for if they should

be long in the bin or bag, they will be apt to heat, and be discoloured.

If the weather be hot, there should no more poles be drawn than can be picked in an hour, and they should be gathered in fair weather, if it can be, and when the Hops are dry; this will save some expence in firing, and preserve their colour better when they are dried.

The best method of drying Hops is with charcoal on an oast or kiln, covered with hair-cloth, of the same form and fashion that is used for drying malt. There is no need to give any particular directions for the making it, since every carpenter or bricklayer, in those countries where Hops grow, or malt is made, knows how to build them.

The kiln ought to be square, and may be of ten, twelve, fourteen, or sixteen feet over at the top, where the Hops are laid, as your plantation requires, and your room will allow. There ought to be a due proportion between the height and the breadth of the kiln, and the beguels of the steddle where the fire is kept, *viz.* if the kiln be twelve feet square on the top, it ought to be nine feet high from the fire, and the steddle ought to be six feet and a half square, and so proportionable in other dimensions.

The Hops must be spread even upon the oast a foot thick or more, if the depth of the curb will allow it, but care is to be taken not to overload the oast, if the Hops be green or wet.

The oast ought to be first warmed with a fire before the Hops are laid on, and then an even steady fire must be kept under them; it must not be too fierce at first, lest it scorch the Hops; nor must it be suffered to sink or slacken, but rather be increased till the Hops be nearer dried, lest the moisture or sweat, which the fire has raised, fall back or discolour them. When they have lain about nine hours, they must be turned, and in two or three hours more they may be taken off the oast. It may be known when they are well dried, by the brittleness of the stalks, and the easy falling off of the Hop leaves.

It is found by experience, that the turning of Hops, though it be after the most easy and best manner, is not only an injury or waste to the Hops, but also an expence of fuel and time, because they require as much fuel, and as long a time to dry a small quantity, by turning them, as a large one.

Now this may be prevented, by having a cover, (to be let down and raised at pleasure) to the upper bed whereon the Hops lie.

This cover may also be tinned, by nailing single tin plates over the face of it, so that when the Hops begin to dry, and are ready to burn, *i. e.* when the greatest part of their moisture is evaporated, then the cover may be let down within a foot or less of the Hops (like a reverberatory), which will reflect the heat upon them, so that the top will soon be as dry as the lowermost, and every Hop be equally dried.

As soon as the Hops are taken off the kiln, lay them in a room for three weeks or a month to cool, give, and toughen, for if they are bagged immediately, they will powder, but if they lie awhile (and the longer they lie the better, provided they be covered close with blankets to secure them from the air,) they may be bagged with more safety, as not being liable to be broken to powder in treading, and this will make them bear treading the better, and the harder they are trodden the better they will keep.

The common method of bagging is as follows: they have a hole made in an upper floor, either round or square, large enough to receive a hop-bag (which consists of four ells and a half of ell-wide cloth, and also contains ordinarily two hundred and a half of Hops, they tie a handful of Hops in each lower corner of the bag, to serve as handles

to it, and they fasten the mouth of the hole, so placed that the hoop may rest upon the edges of the hole.

Then he that is to tread the Hops down into the bag, treads the Hops on every side, another person continually putting them in as he treads them, till the bag is full, which being well filled and trodden, they unrip the fastening of the bag to the hoops, and let it down, and close up the mouth of the bag, tying up a handful of Hops in each corner of the mouth, as was done in the lower part.

Hops being thus packed, if they have been well dried, and laid up in a dry place, they will keep good several years; but care must be taken, that they be neither destroyed nor spoiled by the mice making their nests in them.

The crop of Hops being thus bestowed, you are to provide for another, first by taking care of the poles against another year, which are best to be laid up in a shed, having first stripped off the haulm from them; but if you have not that conveniency, set up three poles in the form of a triangle, or six poles (as you please) wide at bottom; and having set them into the ground, with an iron picker, and bound them together at the top, set the rest of your poles about them; and being thus disposed, none but those on the outside will be subject to the injuries of the weather, for all the inner poles will be kept dry, unless at the top; whereas, if they were on the ground, they would receive more damage in a fortnight, than by their standing all the rest of the year.

In the winter time provide your soil and manure for the Hop-ground against the following spring.

If the dung be rotten, mix it with two or three parts of common earth, and let it incorporate together till you have occasion to make use of it in making your Hop-hills; but if it be new dung, then let it be mixed as before, till the spring come twelvemonths, for new dung is very injurious to Hops.

Dung of all sorts was formerly more commonly made use of than it is now, especially when rotted, and turned to mould, and they who have no other manure must use it; which, if they do, cows or hogs-dung, or human ordure mixed with mud, may be a proper compost, because Hops delight most in a manure that is cool and moist.

LUTEOLA. See Reseda.

LYCHNIDEA. See Phlox.

LYCHNIS. *Turn. Inst. R. H. 333. tab. 175.* Champion.

The Characters are,

The flower hath five petals, whose tails are the length of the empalement. It hath ten stamina, which are alternately ranged, and fastened to the tails of the petals. In the center is situated an almost oval germen. The empalement afterward becomes an oval capsule with one cell, opening with five valves, filled with roundish seeds.

The Species are,

1. LYCHNIS *floribus fasciculatis fastigiatis.* Hort. Cliff. 174. Greater hairy Champion with a scarlet flower.
2. LYCHNIS *petalis integris.* Lin. Sp. Plant. 436. Champion with entire petals; commonly called the Single Catchfly.
3. LYCHNIS *floribus dioicis.* Hort. Cliff. 171. Champion with male and female flowers on different plants; frequently called Bachelors Button.
4. LYCHNIS *floribus dioicis, calycibus inflatis hirsutis.* Wild Champion with a single white flower.
5. LYCHNIS *petalis quadrifidis, fructu subrotundo.* Hort. Cliff. 174. Champion with quadrifid petals, and a roundish fruit; commonly called Ragged Robin.
6. LYCHNIS *petalis bifidis corymbosis.* Lin. Sp. Plant. 436. Champion with bifid petals, and flowers growing in a corymbus.
7. LYCHNIS *petalis bifidis, caule dichotomo, foliis subhirtis.* Lin. Sp. Plant. 437. Champion with bifid petals, a stalk divided by pairs, and leaves which are somewhat hairy.

8. LYCHNIS *caule erecto, calycibus striatis acutis, petalis dissectis.* Fig. Plant. Plat. 170. Champion with an erect stalk, striped acute empalements, and petals cut into many parts.

The first sort here mentioned is commonly known by the title of scarlet Lychnis; of which there is one with double flowers, which is most esteemed for the size of the flowers and multiplicity of the petals; as also for the duration of the flowers, which continue much longer in beauty than the single flowers, so that the latter is not much cultivated at present, though the flowers of this are very beautiful; and as the plants are so easily propagated by seed, they may soon be had in greater plenty than those with double flowers, which do not produce seeds. Of the single sort there are three varieties, the deep scarlet, the flesh colour, and the white, but the first is the most beautiful.

This is easily propagated by seeds, which should be sown on a border exposed to the east, in the middle of *March*. The plants will appear in *April*, and by the end of *June* they will be fit to remove, when there should be a bed of common earth prepared to receive them, into which they should be planted at about four inches apart, observing to water and shade them till they have taken root; after which time they will require no other care but to keep them clean from weeds till the following autumn, when they should be transplanted into the borders of the pleasure-garden where they are to continue. The summer following these plants will flower and produce ripe seed, but the roots will abide several years, and continue to flower.

The sort with double flowers is a valuable plant; the flowers are very double, and of a beautiful scarlet colour. This hath a perennial root, from which arise two, three, or four stalks, according to the strength of the roots, which in rich moist land grow upwards of four feet high; the stalks are strong, erect, and hairy, garnished the whole length with spear-shaped leaves, embracing the stalks; these are placed opposite. The flowers are produced in close clusters sitting upon the top of the stalk; the flowers are double, and of a bright scarlet colour. They appear the latter end of *June*, and in moderate seasons continue near a month in beauty. This was originally produced from the seeds of the single sort, and is propagated by slips from the roots in autumn; but as this is a slow method of increasing the plants, so the best way to have them in plenty is to cut off the stalks in *June*, before the flowers appear, which may be cut into small lengths, each of which should have three joints; these cuttings should be planted on an east border of soft loamy earth, putting two of the joints into the ground, leaving one eye just level with the surface; these must be watered, and then covered close with bell or hand-glasses, so as to exclude the outward air, and shaded with mats when the sun shines hot upon them. The cuttings so managed will put out roots in six weeks or two months, when they must be exposed to the open air. These will make good plants by autumn, when they may be transplanted into the borders of the pleasure-garden, where they will flower the following summer.

I have not seen any double flowers of the two other varieties, but have been informed that there are of both the white and the flesh colour with double flowers in some of the *French* gardens. These make a variety, but are not so beautiful as the scarlet, so are not much esteemed.

The second sort is commonly called Red German Catchfly. This hath been found growing naturally upon the rocks in *Edinburgh* park, and in some places in *Wales*. It was formerly cultivated in flower-gardens for ornament; but since this sort with double flowers hath been produced, the single has been almost banished out of the gardens. This hath long narrow Grass like leaves, which come out from the

root without order, sitting close to the ground; between these come up strait single stalks, which in good ground rise a foot and a half high; at each joint of the stalk come out two leaves opposite, of the same form as the lower, but decrease in their size upward; under each pair of leaves, for an inch in length, there sweats out of the stalk a glutinous liquor, which is almost as clammy as birdlime; so that the flies, which happen to light upon these places, are fastened to the stalk where they die, from whence it had the title of Catchfly. The stalk is terminated by a cluster of purple flowers, and from the two upper joints come out on each side the stalk a cluster of the same flowers, so that the whole form a sort of loose spike. These appear in the beginning of *May*, and are succeeded by roundish seed-vessels, which are full of small angular seeds, ripening in *July*.

It may be propagated in plenty by parting of the roots in autumn, at which time every slip will grow; or if the seeds are sown in the same manner as is directed for the first sort, the plants may be raised in plenty. This delights in a light moist soil, and a shady situation.

The double flowering of this sort was accidentally obtained from the seeds of the single. This has not been known much more than forty years in the *English* gardens, but it is now so common as to have excluded that with single flowers; it differs only from that in having very double flowers. As this never produces seeds, so it can only be propagated by parting and slipping of the roots; the best time for this is in autumn, at which time every slip will grow. If this is performed in *September*, the slips will have taken good root before the frost, and will flower well the following summer; but if they are expected to flower strong, the roots must not be divided into small slips, though for multiplying of the plants it matters not how small the slips are. These should be planted on a border exposed to the morning sun, and shaded when the sun is warm, till they have taken root. If the slips are planted in the beginning of *September*, they will be rooted strong enough to plant in the borders of the flower-garden, by the middle or latter end of *October*. The roots of this sort multiply so fast, as to make it necessary to transplant and part them every year; for when they are let remain longer, they are very apt to rot. This requires the same soil and situation as the former.

The third sort grows naturally by the side of ditches, and in moist pastures in many parts of *England*, so is seldom admitted into gardens. It hath a perennial root, from which arise many branching diffused stalks, from two to three feet high, garnished with oval acute-pointed leaves, placed by pairs at each joint, and are terminated by clusters of purple flowers, which appear in *April* and *May*. The male flowers grow upon separate plants from the female. The latter produces seeds which ripen in *July*; the stalks decay in autumn, but the roots continue several years.

There is a variety of this with double flowers, which is cultivated in gardens, by the title of Red Bachelors Button. This is an ornamental plant, and continues long in flower. It is propagated by slips, which should be planted the beginning of *August* in a shady border of loamy earth, where they will take root in about six weeks or two months, and may then be transplanted into the borders of the flower-garden. These roots should be annually transplanted, otherwise they frequently rot; and young plants must be propagated by slips, to supply the decay of the old roots, which are not of very long duration. This thrives best in a soft loamy soil, and in a shady situation, where they have only the morning sun.

The fourth sort is very common upon dry banks on the side of roads, in most parts of *England*, so is not admitted into gardens. There is a variety of this with purple flowers, which I find is by some supposed to be the same as the

third, but is very different, for the stalks of this are branched out much more; the leaves are longer and more veined, and the flowers of this stand singly upon pretty long foot-stalks, so are not produced in clusters like those of the third. This is also very hairy, and the empalement of the flowers is swollen like inflated bladders. This flowers near a month after the other, but the male and female flowers grow upon different plants, as in the former.

There is a variety of this with double flowers, which is propagated in gardens by the title of double white Bachelors Button, and is an ornamental plant in the flower-garden, though being white it doth not make so good an appearance as the other; however, it adds to the variety. This is propagated in the same way as the double sort before-mentioned, but the plants will thrive in a drier soil, and a more open exposure than that.

The fifth sort grows very common in moist meadows, and by the side of rivers in most parts of *England*, where it is intermixed with the Grass. This rises with upright unbranched stalks near a foot and a half high, garnished with narrow spear-shaped leaves, placed opposite at each joint. The stalks are slender, channelled, and are terminated by six or seven purple flowers, upon pretty long foot-stalks which branch out. The empalement of the flower is striped with purple, and the petals of the flowers are deeply jagged in four narrow segments, which appear as if torn; from whence the country people have given it the appellation of Ragged Robin. This sort is never kept in gardens, but there is a variety of it with double flowers, which is propagated by the gardeners for ornament. It only differs from the single in the multiplicity of the petals, and produces no seeds, so is propagated by slips in the same manner as the second sort. It is commonly known by the title of Double Ragged Robin.

The sixth sort grows naturally on the *Alps*, in *Lapland*, and the other cold parts of *Europe*. This is a perennial plant, which delights in a moist soil. The stalks of this are erect, half a foot high, garnished with narrow spear-shaped leaves, placed opposite like the former sort, but are a little shorter and broader. The flowers are produced in a corymbus on the top of the stalk, sitting close together; they are of a purple colour, and the petals are cut in the middle. It is propagated by seeds, and also by parting of the roots; it must have a moist soil and a shady situation, otherwise the plants will not thrive. The time for transplanting the plants and parting the roots, is the same as for the second sort.

The seventh sort grows naturally in *Siberia*. This hath a perennial root, from which arise many narrow leaves sitting close to the ground. The stalks rise a foot high, dividing into branches by pairs. The flowers grow out from the division of the branches, as also at the top of the stalks. They are composed of five white petals, which are divided in the middle, and are succeeded by roundish capsules filled with small angular seeds. This requires the same treatment as the former sort.

The eighth sort was brought from *Portugal* to *England*, and is probably a variety of one with single flowers, which grows naturally in that country, but is different from any we have in *England*. It approaches nearest to the Double Ragged Robin, but is different from that. It hath a perennial root, from which arise many oblong narrow leaves sitting close to the ground. From these come out upright stalks about nine inches high, which divide upwards by pairs; and from the middle of each division comes out a slender foot stalk two inches long, sustaining one double purple flower at the top, whose petals are very much jagged at their points; the empalements of the flowers are marked with deep purple stripes. From the side of the stalks there are also foot-stalks come out at the wings, which for the most

most part sustain but one flower, though sometimes they have two; these flowers being very double, are never succeeded by seeds. It is propagated by slips in the same manner as the third and fourth sorts, but coming from a warm country, it is impatient of much cold, and requires a particular treatment, for it does not thrive well in pots, nor will it live through the winter in open borders; so that the only situation in which I have seen it thrive, was where it was planted as close as possible to a south wall, in dry undunged earth; for in rich or moist ground the roots presently rot, as they also do when they are watered. If they are planted in brick rubbish, they will still do better. I was favoured with this plant by *John Browning, Esq;* of *Lincoln's-Inn*, who received it from *Portugal*.

The other *Species* of *LYCNIUS* are now ranged under the following genera, *viz.*

AGROSTEMMA, *CUCULABUS*, *SAPONARIA*, and *SILENE*, to which articles the reader is desired to turn for those which are not here enumerated.

LYCIUM. *Lin. Gen. Plant.* 232. Boxthorn.

The *Characters* are,

The flower is funnel-shaped, of one petal, with an incurved tube, whose brim is cut into five obtuse segments. It has five awl-shaped stamina. In the center is situated a roundish germen, which afterward becomes a roundish berry with two cells, inclosing kidney-shaped seeds fastened to the middle partition.

The *Species* are,

1. *LYCIUM foliis lineari-longioribus, tubo florum longiori, segmentis obtusis.* Boxthorn with longer linear leaves, a longer tube to the flower, and obtuse segments.

2. *LYCIUM foliis lineari-brevioribus, tubo florum breviori, segmentis ovalibus patentissimis.* Boxthorn with shorter linear leaves, a shorter tube to the flower, and oval segments spreading open.

3. *LYCIUM foliis cuneiformibus.* *Vir. Cliff.* 14. Boxthorn with wedge-shaped leaves.

4. *LYCIUM foliis lanceolatis crassiusculis, calycibus trifidis.* *Lin. Sp. Plant.* 192. Boxthorn with spear-shaped thick leaves, and trifid empalements.

5. *LYCIUM foliis ovato-lanceolatis, ramis diffusis, floribus solitariis patentibus alaribus, stylo longiori.* Boxthorn with oval spear-shaped leaves, diffused branches, and single spreading flowers proceeding from the sides of the branches, with a longer style.

6. *LYCIUM foliis lanceolatis acutis.* Boxthorn with spear-shaped acute leaves.

7. *LYCIUM foliis oblongo-ovatis, crassiusculis, confertis, spinis robustioribus.* Boxthorn with oblong, oval, thick leaves growing in clusters, and stronger spines.

8. *LYCIUM foliis lineari-lanceolatis confertis, calycibus brevibus acutis.* Boxthorn with linear spear-shaped leaves growing in clusters, and short acute empalements.

9. *LYCIUM inermis, foliis lanceolatis, alternis, perennantibus.* Smooth Boxthorn, with spear-shaped ever-green leaves placed alternate.

10. *LYCIUM foliis cordato-ovatis, sessilibus, oppositis perennantibus, spinis crassis bigeminis, floribus confertis.* *Lycium* with oval heart-shaped leaves placed opposite, which are ever-green, and sit close to the stalks, with thick double spines, and flowers growing in clusters.

The first sort grows naturally in *Spain*, *Portugal*, and at the *Cape of Good Hope*. This rises with irregular shrubby stalks ten or twelve feet high, sending out several crooked knotty branches, covered with a whitish bark, armed with long sharp spines, upon which grow many clusters of narrow leaves; these thorns often put out one or two smaller on their sides, which have some clusters of smaller leaves upon them; the branches are garnished with very narrow leaves an inch and a half long, and at the base of these

come out clusters of shorter and narrower leaves. The flowers come out from the side of the branches, standing upon short foot-stalks; they are funnel-shaped, of one petal, with a long incurved tube, cut into five obtuse segments at the brim, of a dull purple colour, and have five stamina, almost as long as the tube, with erect summits. In the center is situated a roundish germen, supporting a style which is longer than the stamina, crowned by a bifid stigma. The germen afterward turns to a roundish fleshy berry, of a yellowish colour when ripe, inclosing several hard seeds.

It may be propagated either by seeds, cuttings, or layers. If by seeds, they should be sown in the autumn soon after they are ripe, for if they are kept out of the ground till spring, they seldom come up the first year. If the seeds are sown in pots, the pots should be plunged into some old tan in the winter, and in very severe frost covered with Peas haulm or straw, but in mild weather should be open to receive the wet; in the spring the pots should be plunged into a moderate hot-bed, which will soon bring up the plants; these must be inured to bear the open air as soon as the danger of the frost is over, and when they are three inches high, they may be shaken out of the pots, and each planted in a small separate pot, and placed in the shade till they have taken new root, when they may be removed to a sheltered situation, where they may remain till the autumn; then they should be either removed into the green-house, or placed under a hot-bed frame to shelter them from hard frost; for these plants are too tender to live in the open air in *England*, so they must be kept in pots, and treated in the same way as *Myrtles*, and other hardy green-house plants; but when the plants are grown strong, there may be a few of them planted in the full ground in a warm situation, where they will live in moderate winters, but in hard frosts they are commonly destroyed. If the cuttings of these plants are planted in a shady border in *July*, and duly watered, they will take root, and may then be treated in the same way as the seedling plants.

The second sort came from the *Cape of Good Hope*. This hath an irregular shrubby stalk like the former, but seldom rises more than four or five feet high; the large leaves are shorter and a little broader than those of the first, but the tufts of small leaves are narrower; the tube of the flower is shorter, the brim is deeper, cut into oval segments which spread open; the empalement is shorter and cut into acute segments; the flowers and fruit are also smaller.

The third sort grows naturally in the hedges in the south of *France*, in *Spain*, and *Italy*. This hath many irregular shrubby stalks, which rise eight or nine feet high, sending out several irregular branches, covered with a white bark, armed with pretty strong thorns; the leaves are narrow at bottom, growing broader upward, and are of a pale green colour. The flowers come out from the side of the branches, they are of a purplish white colour and small, so make no great appearance.

It may be propagated by cuttings or layers, in the same manner as the first sort. The plants will live abroad in a sheltered warm situation, but in very hard frost they should be covered with straw or litter, otherwise the branches will be killed, and sometimes the roots are destroyed where they have not some cover.

The fourth sort was brought from *Africa* by the late *Dr. Shaw*, where it grows naturally. This hath a shrubby stalk which rises seven or eight feet high, sending out several irregular branches, which are armed with strong spines, and garnished with short, thick, spear-shaped, oval leaves, which stand without order. The flowers come out from the side of the branches, they are small and white, so make little appearance. It may be propagated by cuttings in the same

same way as the first sort, but is too tender to live in the open air in winter in this country, so the plants must be kept in pots, and removed into the green-house in autumn, and treated in the same way as other hardy kinds of green-house plants.

The fifth sort grows naturally in *China*. This has weak, irregular, diffused branches, which rise to a great height, but require support, otherwise they will trail upon the ground: I have measured some of these branches, which in one year has been upward of twelve feet long; the lower leaves are more than four inches long, and three broad in the middle, of a light green, and a thin consistence; as the shoots advance in length, so the size of the leaves diminish. The flowers come out singly at the joints toward the upper part of the branches, standing upon short slender foot-stalks; they are of a dull purple colour with short tubes; the brims are spread open broader than either of the former sorts, and the style is considerably longer than the tube of the flower. The plant is very hardy, and retains its leaves till *November* before they decay. It propagates fast enough by its creeping roots, which send out suckers at a great distance, and the cuttings thrust into the ground will take root as freely as Willows.

The sixth sort grows naturally in *China*. This rises with a shrubby stalk to a considerable height, sending out many irregular branches covered with a very white bark, and armed with a few short spines; the leaves are about three inches long, and one broad in the middle. The flowers of this sort appear in *June* and *July*, which are succeeded by small round berries, which are as red as coral. This sort is propagated by cuttings, which should be planted in the spring before they begin to shoot, in a border exposed to the morning sun, where they will take root very freely; but these should not be removed till the autumn, when they may be planted to cover high walls, for the branches are too weak to support themselves; and as the leaves continue green as long as most of the deciduous plants, so they are proper plants for such purposes, for they may be trained to a great height.

The seventh sort was brought me from the *Cape of Good Hope*. This rises with shrubby branching stalks seven or eight feet high, which are armed with long strong thorns, that have several clusters of leaves upon them; the branches are garnished with small, oblong, oval leaves, which are placed without order; sometimes they come out in small clusters from one point, at others they are single; these are of a light green, and a pretty thick consistence. The plants have not as yet flowered here, so I can give no account of them, but by the fruit, which I received entire, I make no doubt of its belonging to this genus.

This sort is pretty hardy, for it has lived abroad two winters, where it was planted against a south-east wall. It may be propagated either by layers or cuttings, in the same manner as the first; and when the plants have obtained strength, they may be planted in a warm situation, where they will live with very little shelter.

The eighth sort has much the appearance of the first, but the branches are not so strongly armed with thorns; the leaves are broader and of a lighter green, standing in clusters at every joint. The flowers are smaller, of a deeper purple colour, and have much shorter empalements, which are cut into acute segments. It flowers at the same time with the first sort, but does not produce any seeds in this country. It is not so hardy as the former sort, so requires protection from very hard frost; therefore the plants should be kept in pots, and housed in the winter, treating them in the same way as other hardy green-house plants.

The ninth sort has been long an inhabitant of the *Chelsea* garden; it was raised from seeds which came from *China*,

and was for many years taken for the Tea tree, till it produced some flowers, which discovered its true genus. This rises with a strong woody stalk six or seven feet high, sending out many branches, which are covered with a brown bark and are smooth, having no thorns; they are garnished with spear-shaped leaves about three inches long, and near three quarters of an inch broad, placed alternately on the branches, standing upon short foot stalks; they are of a deep green, and continue all the year. The flowers are white, and of the same shape with the others of this genus, but there has not been any seeds as yet produced in *England*.

This plant will live in the open air, if it is planted in a warm situation and a dry soil; but it is of slow growth, seldom shooting more than three or four inches in a season; it is also difficult to propagate, for the branches which are laid down, will not take root in less than two years, and cuttings are with difficulty made to grow.

The tenth sort grows naturally at the *Cape of Good Hope*, from whence the seeds were sent to *Holland* a few years past, where the plants were raised. This is a low shrubby plant, which sends out branches from the ground upward, which are covered with a dark green bark, and are armed with short strong thorns, which come out by pairs, and sometimes there are double pairs upon the same foot-stalk; these are situated just below the leaves, and where there are four, two of them point upward, and the other two downward. The leaves are heart-shaped, not much larger than those of the Box tree, of the same consistence and colour, terminating in acute points; they are placed opposite, upon very short foot-stalks, standing pretty close together; these continue green all the year. The flowers come out from the side of the branches, upon short slender foot-stalks, each supporting five or six small white flowers, which grow in a cluster at the top; these have very short empalements, and pretty long tubes, divided at the brim into five acute segments. These flowers have an agreeable odour, and are succeeded by oval scarlet berries, each containing two seeds.

This sort may be propagated by cuttings in the same manner as the first sort, which, if planted in *July*, and shaded from the sun, will take root very freely; then they should be planted into separate small pots, and placed in the shade till they have taken new root, after which they may be treated in the same manner as the eighth sort. This plant has not as yet been planted in the full ground in *England*, but it lives through the winter under a common frame.

The other species which were included in this genus, are now removed to *Celastrus*.

LYCOPERSICON. *Tourn. Inst. R. H. 150. tab. 63.*
Love Apples, or Tomatas.

The Characters are,

The flower has one wheel-shaped petal, with a very short tube, and a large five-cornered brim which spreads open and is plaited. It hath five small stamina which close together. It hath a roundish germen, which afterward becomes a roundish fleshy fruit or berry, divided into several cells, inclosing many flat seeds.

The Species are,

1. LYCOPERSICON caule inermit herbaceo, foliis pinnatis incis, fructu rotundo glabro. Love Apple with an herbaceous unarmed stalk, pinnated cut leaves, and a smooth round fruit.
2. LYCOPERSICON caule herbaceo, hirsutissimo, foliis pinnatis, incis, fructu compresso sulcato. Love Apple with a very hairy herbaceous stalk, winged cut leaves, and a compressed furrowed fruit; commonly called Tomatas by the Spaniards.
3. LYCOPERSICON caule inermit, herbaceo, erecto, foliis ovatis dentato-angulatis, subspinosis, fructu subrotundo sulcato. Love Apple with an herbaceous, erect; unarmed stalk, oval,

angular, indented leaves, with a few spines, and a roundish furrowed fruit.

4. *LYCOPERSICON caule inermi herbaceo, foliis inæqualiter pinnatis, foliolis obtuse-dentatis, racemis reflexis.* Love Apple with an herbaceous unarmed stalk, leaves unequally winged, whose lobes are bluntly indented, and reflexed spikes.

5. *LYCOPERSICON caule inermi herbaceo, foliis pinnatis, incis, undatis, stylo longiore persistente.* Love Apple with an unarmed herbaceous stalk, winged cut leaves which are waved, and a longer permanent style to the flower.

6. *LYCOPERSICON caule herbaceo, procumbente, foliis pinnatifidis, glabris, floribus solitariis alaribus.* Love Apple with an herbaceous trailing stalk, wing-pointed smooth leaves, and flowers growing singly from the wings of the stalk.

7. *LYCOPERSICON caule inermi herbaceo, foliis pinnatis integerrimis.* Love Apple with an unarmed herbaceous stalk, and winged leaves which are entire; commonly called Potatoe, by the *Indians* Batatas.

The first sort here mentioned, is supposed to be the *Lycopersicon* of *Galen*. This is an annual plant, with an herbaceous, branching, hairy stalk, which will rise to the height of five or six feet if supported, otherwise the branches will fall to the ground; garnished with winged leaves of a very rank disagreeable odour, composed of four or five pair of lobes terminated by an odd one; these are cut on their edges, and end in acute points. The flowers come out from the side of the branches, upon pretty long foot-stalks, each sustaining several yellow flowers, ranged in a single long bunch, which are succeeded by round, smooth, pulpy fruit, about the size of a large Cherry. There are two varieties of this, one with yellow, and the other with red fruit. This is the sort which is used in medicine.

The second sort is very like the first, excepting the shape and size of the fruit, which differ greatly; for those of the second sort are very large, compressed at both ends, and deeply furrowed on the sides. This never varies to the other, nor that to this, so that it is undoubtedly a distinct species. This is the sort which is commonly cultivated for soups, the *Portuguese* and *Spaniards* use them also in many of their sauces, by whom the fruit are called Tomatas.

The third sort is annual; this rises with an erect herbaceous stalk a foot and a half high, dividing into several branches, garnished with oval angular leaves, placed alternately upon pretty long foot-stalks, which have one or two short spines upon the midrib of the leaves. The flowers are white, and come out singly from the side of the branches, which are succeeded by red striated fruit, firmer than those of the other sorts, and about the size of Cherries.

The fourth sort is somewhat like the first, but the leaves are unequally winged, having some smaller lobes placed between the large ones; the lobes of this are shorter, broader, and not cut like those of the first, but have some obtuse indentures toward the base. These have not that rank disagreeable odour which the two first have; the fruit of it is not so large as those of the first, but they are round, smooth, and are very late before they ripen here; so that unless the plants are raised early in the spring, they will not produce ripe fruit in *England*.

The fifth sort is annual; this hath a very branching herbaceous stalk, spreading out into many divisions, and is not so hairy as the two first; the leaves are composed of a greater number of lobes, which are much shorter and more indented on their edges, where they are a little waved. The flowers stand upon very long foot-stalks, which branch out, and support a large number of flowers at the top; these have a longer style than those of the other species, which is permanent, remaining on the top of the fruit. This is also late in ripening the fruit, so that unless the

plants are raised early in the spring, the fruit will not ripen in *England*.

The sixth sort was raised by Mr. *James Gordon*, gardener at *Mile End*, who gave me some of the seeds, but from what country it came I could not learn. This hath very weak, trailing, smooth stalks, not more than a foot long, garnished with smooth leaves, standing by pairs opposite, which are regularly cut on the sides almost to the midrib, in form of a winged leaf; these segments are also indented on their edges, and at their points. The flowers, which are of a pale yellow colour, come out on the side of the stalks singly, and have large spreading empalements, which are deeply cut at the brim into many acute segments which spread open. The flowers are succeeded by small roundish berries a little compressed at the top, of an herbaceous yellow colour when ripe.

All these sorts are propagated by sowing their seeds on a moderate hot-bed in *March*, and when the plants are come up two inches high, they should be transplanted into another moderate hot-bed, at about four inches distance from each other, observing to shade them until they have taken root; after which they must have a large share of fresh air, for if they are too much drawn while young, they seldom do well afterwards.

In *May* these plants should be transplanted, either into pots or borders near walls, pales, or hedges, to which their branches may be fastened to support them from trailing on the ground, which they otherwise will do, and then the fruit will not ripen; so that where these plants are cultivated for the sake of their fruit, they should be planted to a warm aspect, and the branches regularly fastened as they extend, that the fruit may have the advantage of the sun's warmth to forward them, otherwise it will be late in the season before they are ripe, and they are unfit for use before; but when the plants are brought forward in the spring, and thus regularly trained to the south sun, the fruit will ripen by the latter end of *July*, and there will be a succession of it till the frost kills the plants.

The third sort is never used either in the kitchen or for medicine, but the plants are preserved for the sake of variety, especially by those persons who are lovers of botany. This sort is propagated by seeds, which should be sown upon a hot bed in the spring, and the plants afterward treated in the same manner as hath been directed for the *CAPSICUM*, with whose culture this plant will thrive, and produce plenty of fruit annually.

The seventh sort is the common Potatoe, which is a plant so well known now, as to need no description. Of this there are two varieties, one with a red and the other with a white root; that whose roots are red, have purplish flowers, but the white root has white flowers; these are supposed to be only accidental variations, and not distinct species.

The common name of Potatoe, seems to be only a corruption of the *Indian* name Batatas. This plant has been much propagated in *England* within thirty years past, for although it was introduced from *America* about the year 1623, yet it was but little cultivated in *England* till of late; the roots being despised by the rich, and deemed only proper food for the meaner sort of persons; however, they are now esteemed by most people, and the quantity of them which are cultivated near *London*, I believe, exceeds that of any other part of *Europe*.

This is generally propagated by its roots, which multiply greatly, if planted in a proper soil. The common way is, either to plant the small roots or offsets entire, or to cut the larger roots into pieces, preserving a bud or eye to each; but neither of these methods is what I would recommend, for when the smaller offsets are planted, they generally produce

produce a great number of roots, but these are always small; and the cuttings of the larger roots do frequently rot, especially if wet weather happens soon after they are planted; therefore what I would recommend is, to make choice of the fairest roots for this purpose, and to allow them a larger space of ground, both between the rows, as also in the rows, plant from plant; by which method I have observed, the roots have been in general large the following autumn.

The soil in which this plant thrives best, is a light sandy loam, not too dry or over moist; this ground should be well ploughed two or three times, in order to break and divide the parts; and the deeper it is ploughed, the better the roots will thrive. In the spring, just before the last ploughing, there should be a good quantity of rotten dung spread on the ground, which should be ploughed in the beginning of *March*, if the season proves mild, otherwise it had better be deferred until the middle or latter end of that month; for if it should prove hard frost after the roots are planted, they may be greatly injured, if not destroyed thereby; but the sooner they are planted in the spring, after the danger of frost is over, the better it will be, especially in dry land. In the last ploughing, the ground should be laid even, and then the furrows should be drawn at three feet distance from each other, and about seven or eight inches deep. In the bottom of this furrow the roots should be laid, at about one foot and a half asunder; then the furrow should be covered in with the earth, and the same continued through the whole field or parcel of land, intended to be planted.

After all is finished, the land may remain in the same state till near the time when the shoots are expected to appear above ground, when the ground should be well harrowed over both ways, which will break the clods, and make the surface very smooth; and by doing of it so late, it will destroy the young weeds, which, by this time, will begin to make their appearance; and this will save the expence of one hoeing, as also stir the upper surface of the ground, which, if much wet has fallen after the planting, is often bound into a hard crust, which retards the appearance of the shoots.

As I have allotted the rows of Potatoes at three feet distance, it was in order to introduce the hoe plough between them, which will greatly improve these roots; for by twice stirring and breaking of the ground between these plants, it will not only destroy the weeds, but also loosen the ground, whereby every shower of rain will penetrate the ground to the roots, and greatly improve their growth; but these operations should be performed early in the season, before the stems or branches of the plants begin to fall, and trail upon the ground, because after that, it will be impossible to do it without injuring of the shoots.

If these ploughings are carefully performed, it will prevent the growth of weeds, till the haulm of the plants cover the ground, so that afterward there will be little danger of weeds growing so as to injure the crop; but as the plough can only go between the rows, it will be necessary to make use of a hoe to stir the ground, and destroy the weeds in the rows between the plants; and if this is carefully performed in dry weather, after the two ploughings, it will be sufficient to keep the ground clean until the Potatoes are fit to take up.

In places where dung is scarce, many persons scatter it only in the furrows, where the roots are planted; but this is a very poor method, because when the Potatoes begin to push out their roots, they soon extend beyond the width of these furrows, and the new roots are commonly formed at a distance from the old, so will be out of the reach of this dung, and consequently will receive little benefit from it. And as most of the farmers covet to have a crop of Wheat

after the Potatoes are taken off the ground, so the land will not be so thoroughly dressed in every part, nor so proper for this crop, as when the dung is equally spread, and ploughed in all over the land, nor will the crop of Potatoes be so good. I have always observed, where this method of planting the Potatoes has been practised, the land has produced a fine crop of Wheat afterward, and there has scarce one shoot of the Potatoe appeared among the Wheat, which I attribute to the farmers planting only the largest roots; for when they have forked them out of the ground the following autumn, there have been six, eight, or ten large roots produced from each, and often many more, and scarce any very small roots; whereas, in such places where the small roots have been planted, there has been a vast number of very small roots produced; many of which were so small, as not to be discovered when the roots were taken up; so have grown the following season, and have greatly injured whatever crop was on the ground.

The haulm of these Potatoes is generally killed by the first frost in the autumn, then the roots should be taken up soon after, and may be laid up in dry sand in any sheltered place, where they may be kept dry, and secure from frost. Indeed the people who cultivate these roots near *London*, do not wait for the decaying of the haulm, but begin to take up part of them as soon as their roots are grown to a proper size for the market; and so keep taking up from time to time, as they have vent for them. There are others likewise, who do not take them up so soon as the haulm decays, but let them remain much longer in the ground; in which there is no hurt done, provided they are taken up before hard frost sets in, which would destroy them, unless where the ground is wanted for other crops: in which case, the sooner they are taken up the better, after the haulm is decayed. When these roots are laid up, they should have a good quantity of sand or dry earth laid between them, to prevent their heating; nor should they be laid in too large heaps, for the same reason.

LYCOPUS, Water Horehound.

This plant grows in great plenty on moist soils by the sides of ditches, in most parts of *England*, but is never cultivated in gardens, so that it would be needless to say any thing more of it in this place.

LYSIMACHIA. *Tourn. Inst. R. H. 141. tab. 59.* Loostrife.

The Characters are,

The flower is of one petal, cut into five oblong segments, which spread open. It hath five awl-shaped stamina, and a roundish germen, which afterward turns to a globular capsule with one cell, opening with ten valves, and filled with small angular seeds.

The Species are,

1. *LYSIMACHIA paniculata, racemis terminalibus.* *Lin. Sp. Plant. 146.* Greater yellow Loostrife.

2. *LYSIMACHIA racemis lateralibus pedunculatis.* *Lin. Sp. Plant. 147.* Two-leaved Loostrife with yellow globular flowers.

3. *LYSIMACHIA spicis terminalibus patulis, lanceolatis staminibus corollâ longioribus.* *Lin. Sp. Plant. 147.* Narrow-leaved Eastern Loostrife, with a purple flower.

4. *LYSIMACHIA racemis simplicibus terminalibus, petalis obtusis, staminibus corollâ brevioribus.* *Lin. Sp. Plant. 146.* Loostrife with spikes of flowers terminating the stalks, obtuse petals to the flower, and stamina shorter than the petal.

5. *LYSIMACHIA petiolis ciliatis, floribus cernuis.* *Lin. Sp. Plant. 147.* Loostrife with hairy foot-stalks and nodding flowers.

6. *LYSIMACHIA racemis simplicibus terminalibus, petalis obtusis, staminibus corollâ longioribus.* Willow-leaved Loostrife, with a spike of white flowers terminating the stalk.

7. *LYSIMACHIA foliis subcordatis, floribus solitariis, caule repente.* Vir. Cliff. 13. Great Yellow Moneywort.

8. *LYSIMACHIA foliis ovatis acutiusculis, pedunculis folio longioribus, caule repente.* Lin. Sp. Plant. 148. Smaller Moneywort with a purplish flower.

9. *LYSIMACHIA foliis ovatis acutis, floribus solitariis, caule procumbente.* Hort. Cliff. 52. Yellow Pimpernel of the woods.

10. *LYSIMACHIA foliis subquaternis, pedunculis verticillatis unifloris.* Lin. Sp. Plant. 147. Smaller yellow Loostrife, with leaves marked with black spots.

The first sort grows by the side of ditches and rivers in many parts of *England*, so is not often admitted into gardens, because the roots creep far in the ground, whereby it becomes often a troublesome plant. It rises with upright stalks from two to three feet high, garnished with smooth spear-shaped leaves, placed sometimes by pairs, at others there are three, and frequently four of these leaves placed round the stalk at each joint. The upper part of the stalk divides into several foot-stalks, which sustain yellow flowers growing in a panicle; these have one petal which is deeply cut into five segments, spreading open, and are succeeded by roundish seed-vessels, filled with small seeds.

The second sort grows naturally in the northern parts of *England*. This hath a perennial creeping root, which sends up several erect stalks a foot and a half high, garnished at every joint by two pretty long narrow leaves placed opposite. The foot-stalks of the flowers come out opposite on each side of the stalks, sustaining at their top a globular or oval thyrse of yellow flowers, whose stamina are much longer than the petals. This is seldom kept in gardens for the same reason as the former.

The third sort is a biennial plant, which was discovered by Dr. *Journesfort* in the *Levant*. This rises with an upright stalk about a foot high, garnished with spear-shaped leaves, ending in acute points, placed opposite; they are smooth, and of a lucid green. The flowers are purple, and grow in a loose spike, terminating the stalks.

It is propagated by seeds, which should be sown in autumn soon after they are ripe, and from those the plants will come up the following spring; but if the seeds are kept out of the ground till spring, they will not vegetate till the year after. When the plants come up, they must be kept clean till autumn, then they may be planted into the borders of the pleasure-garden, where they will flower and produce ripe seeds the following summer.

The fourth sort is an annual plant, which grows naturally in the *Levant*. This hath a shorter stalk than the former. The lower leaves are broader, the spikes of flowers are shorter, and of a pale purple colour. The seeds of this sort should be sown in the autumn, where the plants are to remain; when they come up they will require no other culture, but to keep them clean from weeds, and if they are too close they should be thinned to the distance of four or five inches, which is all the culture they will require.

The fifth sort grows naturally in *Canada*. This has a perennial creeping root, sending up erect stalks about two feet high, garnished with oblong smooth leaves, placed opposite, which are veined on their under side, and end in acute points. The flowers are produced from the wings of the stalks, each sitting upon a long slender foot-stalk, three or four arising from the short branches, which come out on each side the stalk. The flowers are like those of the first sort, but smaller.

This sort spreads and propagates by roots, in as great plenty as the first, and is equally hardy, so requires no other culture.

The sixth sort grows naturally in *Spain*. This hath a perennial root, from which arise several upright stalks three feet high, garnished with narrow, smooth, spear-shaped

leaves, which stand opposite. The flowers are white, and are produced in a long, close, upright spike, at the top of the stalk; they are cut into five oval segments, which spread open; the stamina stand out longer than the petal.

This is the finest species of this genus; and as the roots of it do not spread like those of the other, so deserves a place in the pleasure-garden, where it is a very ornamental plant for shady borders. It loves a moist soil and a shady situation, where it will continue long in beauty. It may be propagated by parting of the roots in autumn, but by this method it increases slowly, so that the only way to have it in plenty is by sowing of the seeds; these should be sown upon an east-aspected border in autumn, soon after they are ripe, then the plants will come up the following spring. When the plants come up, they should be kept clean from weeds, and if they are too close, some of them may be drawn out and transplanted on a shady border, which will give the remaining plants room to grow till autumn, when they may be transplanted into the borders where they are designed to flower.

The seventh sort is commonly called Moneywort, or Herb Two-pence. This is a perennial plant, which grows naturally in moist shady places in most parts of *England*, so is not cultivated in gardens.

The eighth sort is a small trailing plant, which grows upon bogs in most parts of *England*. The stalks seldom are more than three or four inches long, and are terminated by three or four small flowers, of a bright purple colour, growing in a bunch.

The ninth sort is a perennial plant with trailing stalks, which grows naturally in moist woods in most parts of *England*, so is not cultivated in gardens.

The tenth sort grows naturally among Rushes and Reeds, by the river's side in *Holland*. This hath a perennial creeping root like the first. The stalks rise a foot high, garnished by spear-shaped leaves, placed sometimes by pairs, at others by threes, and often four at each joint, surrounding the stalk. The flowers also come out at each joint, four of them standing round the stalk in whorls, which are yellow. It may be treated in the same manner as the first sort, and is equally hardy.

LYSIMACHIA GALERICULATA. See *Scutellaria*.

LYSIMACHIA NON PAPPOSA. See *Cenothera*.

LYSIMACHIA SILIQUOSA. See *Epilobium*.

LYTHRUM. Lin. Gen. Plant. 532. Willow Herb, or purple Loostrife.

The Characters are.

The flower hath six oblong blunt petals, which spread open, whose tails are inserted in the indentures of the empalement, and ten slender stamina. In the center is situated an oblong germen, which after-ward turns to an oblong acute capsule with two cells, filled with small seeds.

The Species are,

1. *LYTHRUM foliis oppositis cordato-lanceolatis, floribus spicatis dodecandriis.* Lin. Sp. Plant. 446. Common purple Willow Herb with oblong leaves.

2. *LYTHRUM foliis cordato-ovatis, floribus verticillato-spicatis tomentosis.* Purple Willow Herb with roundish leaves.

3. *LYTHRUM foliis alternis linearibus, floribus hexandriis.* Hort. Upsal. 118. Willow Herb with a narrow Hyssop leaf.

4. *LYTHRUM foliis oblongo-ovatis inferne oppositis, supernè alternis, floribus hexandris.* Spanish Willow Herb with a Hyssop leaf, and oblong, deep, blue flowers.

The first sort grows naturally by the side of rivers and ditches in most parts of *England*. It has a perennial root, from which come forth several upright angular stalks, which rise from three to four feet high, garnished with oblong leaves, placed sometimes by pairs; at others there are three leaves at each joint, standing round the stalk. The flowers are

are purple, and are produced in a long spike at the top of the stalk, which make a fine appearance. Although this plant is despised, because it grows common, yet it merits a place in gardens better than many other which are propagated with care, because they are more rare. It is easily cultivated by parting of the roots in autumn, and should be planted in a moist soil, where it will thrive and flower without any other care than the keeping it clean from weeds.

There is a variety of this with an hexangular stalk, and generally with three leaves at each joint, but this is only accidental, for the roots of this, when removed into a garden, come to the common sort.

The second sort is like the first, but has oval, heart-shaped, downy leaves, placed by threes round the stalk. The flowers are produced in long spikes at the top of the stalks, disposed in thick whorls, with spaces between each; they are of a fine purple colour, and appear at the same time with the former.

The third sort grows naturally on moist bogs in many parts of *England*, so is seldom admitted into gardens.

The fourth sort grows naturally in *Spain* and *Portugal*, from both which countries I have received the seeds. The root of this is perennial. The stalks are slender, not more than nine or ten inches long, spreading out on every side. The lower part of the stalks are garnished with oblong oval leaves, placed opposite. On the upper part of the stalks the leaves are narrower, and placed alternate. The flowers come out singly from the side of the stalks at each joint; they are larger than those of the common sort, and of a deeper purple colour, so make a fine appearance in *July*, when they are in beauty.

This sort has never produced any seeds in *England*, and the severe winter in 1740, killed all the plants here, since which time I have not seen any of the plants in the *English* gardens.

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MACALEB. See *Cerasus*.

MADDER. See *Rubia*.

MMAGNOLIA. *Plum. Nov. Gen. 38. tab. 7. Lin. Gen. Plant. 610.* The Laurel-leaved Tulip tree.

The Characters are,

The flower is composed of eight or ten oblong, concave, blunt leaves. It hath a great number of short stamina, which are inserted into the germen, and many oblong oval germina, fastened to the receptacle, supporting recurved contorted styles, with hairy stigmas. The germen afterward becomes oval cones, with imbricated capsules, having one cell, opening with two valves, inclosing one kidney-shaped seed, hanging by a slender thread from the scale of the cone.

The Species are,

1. *MAGNOLIA foliis ovato-lanceolatis subtus glaucis annuis.* Magnolia with oval spear-shaped leaves, which are gray on their under side, and annual; commonly called Small Magnolia.

2. *MAGNOLIA foliis lanceolatis persistentibus, caule erecto arboreo: Fig. Plant. tab. 172.* Magnolia with spear-shaped leaves, which are ever-green, and an erect tree-like stalk; commonly called Greater Magnolia.

3. *MAGNOLIA foliis lanceolatis amplissimis annuis, petalis exterioribus dependentibus.* Magnolia with very large spear-shaped leaves, which are annual, and the outer petals of the flower declining; commonly called Umbrella tree.

4. *MAGNOLIA foliis ovato-lanceolatis acuminatis annuis, petalis obtusis.* Magnolia with oval, spear-shaped, pointed leaves, which are annual, and obtuse petals to the flower.

The first sort grows pretty common in *Virginia* and *Carolina*, and other parts of *North America*. In moist places this grows from seven or eight to fifteen or sixteen feet high, with a slender stem. The wood is white and spongy, the bark is smooth and white; the branches are garnished with thick smooth leaves, resembling those of the Bay, but are of an oval shape, smooth on their edges, and white underneath. The flowers are produced at the extremity of the

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branches, which are white, and composed of six concave petals, and have an agreeable sweet scent. After these are past, the fruit increases in size to be as large as a Walnut with its cover, but of a conical shape, having many cells round the outside; in each of which is lodged a flat seed, about the size of a small Kidney Bean. The fruit is at first green, afterward red, and when ripe of a brown colour. The seeds when ripe are discharged from their cells, and hang by a slender thread.

When these trees are transplanted from the places of their growth into dry ground, they make handfomer trees, and produce a great number of flowers. This is to be understood of *America*, for in *Europe* they do not thrive so well in a dry soil, as in a moist loamy land.

The second sort grows in *Florida* and *South Carolina*, where it rises to the height of eighty feet or more, with a strait trunk upward of two feet diameter, having a regular head. The leaves of this tree resemble those of the common Laurel, but are much larger, and of a lucid green on their upper side, and in some trees are of a russet or buff colour on their under side. These leaves continue all the year, so that this is one of the most beautiful ever green trees yet known. The flowers are produced at the end of the branches, composed of eight or ten petals, which are narrow at their base, but broad at their extremity, where they are rounded, and a little waved; they are of a purple white colour. In the center is situated a great number of stamina and styles, fastened to one common receptaculum; the flowers are succeeded by oblong scaly cones. These trees, in their native places of growth, begin to produce their flowers in *May*, which are succeeded by others, so that the woods are perfumed with their odour for a long time; but those which have flowered in *England*, seldom begin till the middle of *June*, and do not continue long in beauty. There are many large plants of this sort in the gardens of his Grace the Duke of *Richmond*, at *Goodwood* in *Suffex*, which have produced flowers several years; and in the nursery of Mr.

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Christopher Gray, near *Fulham*, there is one very handsome plant, which has lived in the open air many years, and has also flowered several years.

As this sort is a native of a warm country, it is a little impatient of cold, especially while young, therefore the plants should be kept in pots, and sheltered in winter for some years, until they have acquired strength, when they may be shaken out of the pots, and planted in the full ground; but they must be planted in a warm situation, where they may be defended from the strong winds, and screened from the north and east, otherwise they will not live abroad.

The third sort grows in *Carolina* pretty frequent, but in *Virginia* it is pretty rare. This usually grows from sixteen to twenty feet high, with a slender trunk, the wood is soft and spongy; the leaves of this tree are remarkably large, and are produced in horizontal circles, somewhat resembling an Umbrella, from whence the inhabitants of those countries have given it this name. The flowers are composed of ten or eleven white petals, which hang down without any order; the fruit is very like that of the former sort, but longer; the leaves of this sort drop off at the beginning of winter.

This tree is as yet very rare in *Europe*, but as it is propagated from seeds, we may hope to have it in greater plenty soon, if we can obtain good seeds from *Carolina*, for it is rarely met with in *Virginia*.

The fourth sort is also very rare in *England*. There are but few of the plants at present here, nor is it very common in any of the habitable parts of *America*; some of these trees have been discovered by Mr. *John Bartram*, growing on the north branch of *Susquehannab* river. The leaves of this tree are near eight inches long and five broad; ending in a point. The flowers come out early in the spring, which are composed of twelve white petals, and are shaped like those of the second sort; the fruit of this tree is longer than those of the other species, but in other respects agrees with them. The wood of this tree is of a fine grain, and an Orange colour.

All these sorts are propagated by seeds, which must be procured from the places of their natural growth; these should be put up in sand, and sent over to *England*, as soon as possible, for if they are kept long out of the ground, they very rarely grow; therefore the seeds should be sown as soon as possible, when they arrive here.

Some years past I received a good quantity of these seeds from *Carolina*, which I sowed in pots as soon as I received them, and plunged the pots into a moderate hot-bed, and with this management I raised a great number of plants; but from the seeds which have been lately brought over, there have been but few plants produced; whether the seeds were not perfectly ripe when they were gathered, or from what other cause this has happened, I cannot say, but it is certain the fault must be in the seeds, because they have been differently sown and managed by the several persons who received them, and the success was nearly alike everywhere.

There have been several plants of the first and second sorts raised from layers, and some from cuttings; but these do not thrive so well as those which come from seeds, nor will they grow to near the size of those, so that it is much the best way to procure their seeds from *America*, and propagate them that way.

The first sort frequently comes up well from seeds, but the young plants are very difficult to keep the two first years; for if they are exposed much to the sun, their leaves change yellow, and the plants decay, so the best way is to keep the pots plunged in a moderate hot-bed, and shade them every day from the sun with mats, giving them air

in plenty when the weather is warm, and frequently refresh them with water; during the winter season they must be screened from frost, and in mild weather they must enjoy the free air, to prevent their growing mouldy; they should have but little wet after their leaves are fallen. With this management the plants may be trained up, and when they have acquired strength, they may be planted in the open air, where they will thrive and flower, if they have a sheltered situation.

The second sort is not so difficult to train up; but in order to get them forward, it will be proper, when they are removed out of the seed-pots, to plant them each into a separate small pot, and plunge them into a gentle hot-bed of tanners bark, observing to shade them from the sun, and admit proper air to them; but at *Midsummer* they should be inured to the open air gradually, and then placed in a sheltered situation, where they may remain till autumn; but on the first approach of frost, they should be removed under shelter, otherwise the early frosts will pinch their tender shoots, which often occasions their dying downward after. When the plants have got strength, some of them may be turned out of the pots, and planted in the full ground, in a warm sheltered situation; but part of them should be kept in pots, and sheltered in the winter, to preserve them, lest by severe frost the other should be killed.

If the plants make good progress, they will be strong enough to plant in the full ground in about six or seven years. The time for removing or shifting these plants is in *March*, before they begin to shoot, which may sometimes happen to be too soon to turn them out of the pots into the full ground, especially if the season proves late; but as there will be no danger in removing them out of the pots, the ball of earth being preserved to their roots, so it is best to defer this till the month of *April*; but it will be necessary to harden those plants which are intended to be planted out, by exposing them to the air as much as possible, for this will keep the plants backward, and prevent their shooting; for if they make shoots in the green-house, those will be too tender to bear the sun, until they are by degrees hardened to it, and the least frost will greatly pinch them, and such often happen very late in the spring.

The two or three winters after these are planted out, it will be necessary to lay some mulch on the surface of the ground about their roots, as also to throw some mats over their heads, especially at the beginning of the morning frosts in autumn, for the reasons before given; but they should never be too closely covered up, lest the shoots should grow mouldy, for that will certainly kill the leading buds of every shoot, and prove to the full as injurious to them as the frost. As the plants get strength, they will be better able to endure the cold of our climate, though it will be proper to lay some mulch about their roots every winter, and in very severe frost to cover their heads and stems.

It is the second sort which requires the most care, being much tenderer than any of the other sorts, for they will endure the cold very well, without much care, after they have acquired strength; for as these lose their leaves in the winter, the frost will not have so much force upon them as the second sort, whose leaves are frequently tender toward the end of the shoots, especially when they grow freely, or shoot late in the autumn.

MAHALEB. See *Cerasus*.

MAJORANA. See *Origanum*.

MALABAR NUT. See *Justicia*.

MALA ÆTHIOPICA. See *Lycopersicon*.

MALA ARMENICA. See *Armeniaca*.

MALACOIDES. See *Malope*.

MALA COTONEA. See *Cydonia*.

MALA INSANA. See *Malongena*.

MALLOW. See Malva.

MALLOW Tree. See Lavatera.

MALOPE. Bastard Mallow.

The Characters are,

The flower is shaped like that of the Mallow, and hath a double empalement, the outer being composed of three, and the inner is of one leaf, cut into five segments; the flower is of one petal, divided into five parts to the bottom. In the center is situated the column, having a great number of stamina and styles joined closely to it. The germen afterward becomes a fruit composed of many cells, which are collected into a head, in each of which is lodged a single seed.

We have but one Species of this plant, viz.

MALOPE *foliis ovatis crenatis glabris*. Lin. Hort. Cliff. 347. Bastard Mallow with oval smooth leaves, which are notched.

The whole plant has greatly the appearance of the Mallow, but differs from it, in having the cells collected into a button, somewhat like a Blackberry; the branches spread, and lie flat upon the ground, extending themselves a foot or more each way. The flowers are produced singly upon long foot-stalks, from the setting on of the leaves, which are in snape and colour like those of the Mallow.

This is propagated by seeds, which should be sown upon a warm border in August, where the plants will come up before winter, which should be planted in small pots, and sheltered under a hot-bed frame, for they are too tender to live in the open air in winter; but in summer they should be placed with other hardy foreign plants in a sheltered situation, where in warm seasons they will produce seeds.

MALPIGHIA. Plum. Nov. Gen. 46. tab. 36. Barbadoes Cherry.

The Characters are,

The flower has five kidney-shaped petals, which are concave, and spread open, and ten awl-shaped stamina, and two mellow glands adhering to the empalement. It has a small roundish germen, supporting three slender styles. The germen afterward turns to a large, furrowed, globular berry, with one cell, inclosing three rough, stony, angular seeds.

The Species are,

1. MALPIGHIA *foliis ovatis integerrimis glabris, pedunculis umbellatis*. Hort. Cliff. 169. Malpighia with smooth, oval, entire leaves, and umbellated foot-stalks; commonly called Barbadoes Cherry.

2. MALPIGHIA *foliis ovato-lanceolatis, acuminatis, glabris, pedunculis umbellatis*. Malpighia with the appearance of the Pomegranate tree.

3. MALPIGHIA *foliis lanceolatis subtus incanis, pedunculis umbellatis alaribus*. Malpighia with spear-shaped leaves, hoary on their under side, and umbellated foot-stalks proceeding from the wings of the stalk.

4. MALPIGHIA *foliis cordato-lanceolatis, setis decumbentibus rigidis, pedunculis unifloris aggregatis*. Broad-leaved Malpighia, with spines growing on the under side of the leaf.

5. MALPIGHIA *foliis ovatis acutis glabris, pedunculis umbellatis alaribus terminalibusque*. Malpighia with oval, smooth, acute-pointed leaves, and umbellated foot-stalks proceeding from the sides and ends of the branches.

6. MALPIGHIA *foliis lineari lanceolatis, setis decumbentibus rigidis, pedunculis unifloris aggregatis*. Malpighia with linear spear-shaped leaves, rigid declining bristles, and foot-stalks having one flower, proceeding from the sides of the branches in clusters.

7. MALPIGHIA *foliis lanceolatis dentato-spinosis subtus hispida*. Lin. Sp. Plant. 426. Malpighia with spear-shaped leaves, indented and prickly, whose under sides are set with spiny hairs.

8. MALPIGHIA *foliis subovatis dentato-spinosis, pedunculis unifloris*. Malpighia with leaves nearly oval, indented and prickly, and foot-stalks with one flower.

The first sort is commonly cultivated in the *West-Indies* for the sake of the fruit; this usually grows to the height of sixteen or eighteen feet, having a slender stem, covered with a light brown bark. The leaves are placed opposite to each other; they are oval, smooth, ending in acute points, and continue green all the year. The flowers are produced in bunches upon pretty long foot-stalks, which come out from the side of the branches; they are composed of five petals, which are of a Rose colour, joined at their base. The flowers are succeeded by red fruit, shaped like those of the small wild Cherry, of the same size, each inclosing four angular furrowed stones, surrounded by a thin pulp, which has an agreeable acid flavour.

The second sort grows naturally in *Jamaica*. This rises with a shrubby stalk ten or twelve feet high, dividing into several slender spreading branches, covered with a light brown bark, garnished with oval, spear-shaped, smooth leaves placed opposite, ending in acute points. The flowers are produced in umbels at the end of the branches, standing upon short foot-stalks; they are of a pale Rose colour, composed of five obtuse, concave, indented petals, having long narrow tails. In the center is situated the roundish germen, supporting three styles, attended by ten stamina which spread asunder. The germen afterward turns to a roundish pulpy berry with many furrows, red when ripe, inclosing three or four hard angular seeds.

The third sort grows naturally at *Campeachy*. This rises with a strong woody stalk eighteen or twenty feet high; dividing into many branches, covered with a brown spotted bark, garnished with spear-shaped leaves placed opposite, which are hoary on their under side. The flowers come out in umbels from the side of the branches; they are of a Rose colour, and are succeeded by oval channelled fruit, like those of the former sort.

The fourth sort grows naturally in *Jamaica*. This rises with a woody stalk from fifteen to eighteen feet high, dividing into many strong branches, which are furrowed and covered with a brown bark. The leaves are from three to four inches long, and one broad at their base, where they are rounded in form of a heart, lessening gradually to the point; these are covered on their under sides with stinging bristly hairs so closely, as to render it very troublesome to handle them, for these fasten themselves into the flesh, and are difficult to get out again. The flowers are produced in umbels from the side of the branches; they are of a light purple colour, and shaped like those of the other species, and are succeeded by oval furrowed fruit, like those of the former sort. This is called in the *West-Indies* Couhage, or Cowitch Cherry.

The fifth sort grows naturally at *Cartagena* in *New Spain*. This rises with a shrubby stalk about ten feet high, covered with a light brown spotted bark, branching out regularly on every side; the leaves are oval, smooth, and end in acute points, standing opposite, of a light green on their upper side, but paler on their under. The flowers come out from the side of the stalks in small umbels, standing erect; the foot-stalks of the umbels are scarce an inch long, and come out alternately from the side of the branches. The flowers are of a pale blush colour, shaped like those of the former sorts, which are succeeded by roundish furrowed berries with a red skin, covering three hard angular seeds.

The sixth sort grows in the island *Barbuda*. This rises with a shrubby stalk seven or eight feet high, covered with a bright purplish bark, which is spotted and furrowed, dividing toward the top into several smaller branches, garnished with narrow spear-shaped leaves, of a lucid green on their upper side, but of a russet brown on their under, where they are closely armed with stinging bristles, which fasten themselves into the flesh on clothes of those who touch them.

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The flowers are produced from the side of the branches in clusters; they are of a pale purple colour, of the same form as the other species, and are succeeded by small, oval, furrowed fruit, of a dark purple colour when ripe.

The seventh sort grows naturally in the island of *Cuba*. This rises with a shrubby stalk to the height of seven or eight feet, sending out branches the whole length, covered with a gray bark, and garnished with narrow prickly leaves like those of the Holly, which have many stinging bristles on their under side. The flowers are of a pale blush colour, and are produced in small clusters from the side of the branches. The fruit is more pointed than those of the common sort, and turns to a dark purple colour when ripe.

The eighth sort grows naturally near the *Havannah*. This is a very low shrub, seldom rising more than two or three feet high; the stalk is thick and woody, covered with a rough gray bark, garnished with lucid green leaves, which appear as if cut at their ends, where they are hollowed in, and the two corners rise like horns ending in a sharp thorn, as do also the indentures on the sides. The flowers come out from the side of the branches, upon foot-stalks an inch long, each sustaining one small, pale, blush flower, of the same form with those of the other species; the fruit is small, conical, and furrowed, changing to a purple red colour when ripe.

The fruit of most of the species here mentioned, are promiscuously gathered and eaten by the inhabitants of the countries where they grow; but the first sort is that which is cultivated in some of the islands for its fruit, though it is but indifferent; the pulp which surrounds the stone is very thin, but has a pleasant acid flavour, which renders it agreeable to the inhabitants of those warm countries, where, to supply the want of those Cherries which are cultivated in *Europe*, they are obliged to eat the fruit of these shrubs.

These plants are preserved in the gardens of those persons who are so curious in botanical studies, as to erect hot-houses for maintaining foreign plants; and where there are such conveniencies, these plants deserve a place, because they retain their leaves all the year, and commonly continue flowering from *December* to the end of *March*, when they make a fine appearance at a season, when there is a scarcity of other flowers, and many times they produce ripe fruit here. Those sorts whose leaves are armed with stinging bristles, like the Cowitch, are the least worthy of a place in stoves, because they are so troublesome to handle, nor do their flowers make so good an appearance as many of the other sorts.

As these plants are natives of the warmest parts of *America*, so they will not live through the winter in *England*, unless they are preserved in a warm stove; but when the plants have obtained strength, they may be exposed in the open air in a warm situation, from the middle or latter end of *June*, till the beginning of *October*, provided the weather continues so long mild; and the plants so treated, will flower much better than those which are constantly kept in a stove.

They are all propagated by seeds, which must be sown upon a good hot-bed; and when the plants are fit to transplant, they must be each put into a separate small pot, and plunged into a hot-bed of tanners bark, and must be treated in the same manner as hath been directed for other tender plants of the same country; the two first winters it will be proper to keep them in the bark-bed in the stove; but afterward they may be placed upon stands in the dry stove in winter, where they may be kept in a temperate warmth, in which they will thrive much better than in a greater heat; these must be watered two or three times a week, when they are placed in the dry stove, but it must not be given to them in large quantities.

MALVA. *Tourn. Inst. R. H. 94. tab. 23. Mallows.*

The Characters are,

The flower has a double empalement; the outer is composed of three, the inner is of one leaf, cut into five broad segments at the brim. The flower is of one petal. It has a great number of stamina which coalesce at bottom in a cylinder, but spread open above. In the center is situated an orbicular germen supporting a short cylindrical style, with many bristly stigmas. The empalement afterward turns to several capsules, which are joined in an orbicular depressed head fastened to the column, opening on their inside, each containing one kidney-shaped seed.

The Species are,

1. MALVA caule erecto herbaceo, foliis lobatis obtusis, pedunculis petiolisque pilosis. *Lin. Sp. Plant. 689.* Wild Mallow with a sinuated leaf.

2. MALVA caule repente, foliis cordato-orbiculatis obsolete quinquelobatis. *Hort. Cliff. 347.* Common Mallow with a small flower and a round leaf.

3. MALVA annua, caule erecto herbaceo, foliis lobatis obtusis crenatis. Annual Mallow with an erect herbaceous stalk, and obtuse lobed leaves which are crenated.

4. MALVA caule erecto, foliis angulatis, floribus axillaribus glomeratis. *Vir. Cliff. 356.* Curled or furbelowed Mallow.

5. MALVA annua, caule erecto herbaceo simplici, foliis suborbiculatis obsolete quinquelobatis, floribus confertis alaribus sessilibus. Upright, annual, China Mallow, with very small white flowers.

6. MALVA caule erecto ramoso hirsuto, foliis angulatis, floribus alaribus pedunculis brevioribus. Tallest annual Mallow of *Crete*, with small flowers growing in umbels on the sides of the stalk.

7. MALVA caule erecto herbaceo, foliis lobatis, spicis secundis axillaribus. *Lin. Sp. Plant. 688.* Mallow with an erect herbaceous stalk, leaves having lobes, and spikes of flowers proceeding from the sides of the stalks.

8. MALVA caule erecto, foliis multipartitis scabriusculis. *Hort. Cliff. 347.* Narrow-leaved, curled, Vervain Mallow.

9. MALVA caule erecto, foliis trilobatis obtusis dentatis glabris. Common, greater, Vervain Mallow.

10. MALVA caule erecto hirsuto, foliis trilobatis dentatis subtus tomentosis. Mallow with an erect hairy stalk, and indented leaves having three lobes, which are downy on their under side.

11. MALVA foliis radicalibus reniformibus incisiss, caulibus quinque partitis pinnato multifidis. *Hort. Upsal. 202.* Round, cut-leaved, Vervain Mallow.

12. MALVA foliis palmatis dentatis, corollis calyce minoribus. *Lin. Sp. Plant. 690.* Egyptian Vervain Mallow with a Crane's-bill leaf.

13. MALVA foliis quinquelobatis incisiss, calycibus acutis bipidibus, pedunculis longissimis. Maritime Vervain Mallow of *Provence*, with a Crane's-bill leaf.

14. MALVA foliis subcordatis laciniatis hirsutis, caule arborescente. African shrubby Mallow with a red flower.

15. MALVA foliis cordatis crenatis, floribus lateralibus solitariis, terminalibus spicatis. *Prod. Leyd. 359.* Low American Marshmallow, with a yellow spiked flower.

The two first sorts are found wild in most parts of *England*, so are rarely cultivated in gardens. The first is the sort commonly used in medicine, with which the markets are supplied by the herb-folks, who gather it in the fields.

The third sort was discovered by *Dr. Tournefort* in the *Levant*. This is an annual plant, with an erect stalk; the flowers are larger than those of the common sort, and are of a soft red colour.

The fourth sort is annual. This rises with an upright stalk four or five feet high; the leaves are curled on their edges, for which variety it is preserved in gardens.

The fifth sort was formerly sent from *China* as a pot-herb, and hath been cultivated in some curious gardens in *England*; though it is not likely to obtain here as an esculent plant, since we have many others which are preferable to it for that purpose. This is an annual plant, which will propagate itself fast enough, provided it be permitted to scatter its seeds.

The sixth sort was discovered by Dr. *Tournefort*, in the island of *Candia*. This will become a weed, if suffered to scatter the seeds.

The seventh sort grows naturally in *Peru*. This is an annual plant, rising with an upright branching stalk two feet high, garnished with broad hairy leaves, having three lobes. The flowers grow in spikes from the wings of the stalks of a pale blue, set very closely on the spikes, and are succeeded by seeds, which, if permitted to scatter, will come up plentifully the following spring without care.

The eighth sort is a biennial plant, which grows naturally in pastures in many parts of *England*, so is seldom admitted into gardens. The stalks of this are a foot and a half long, and frequently incline toward the ground. The leaves are finely cut into narrow segments almost to the midrib, and these segments are deeply indented. The flowers are shaped like those of the common Mallow, and are of a Rose colour.

The ninth sort is the common Vervain Mallow, which is mentioned in the catalogue of medicinal plants. This is found growing naturally in some of the midland counties in *England*, but not near *London*. It is a biennial plant, the stalks rise higher than those of the former; the leaves are cut into three obtuse lobes, which are indented. The flowers are larger than those of the former, but appear at the same time, and the seeds ripen in autumn.

The tenth sort differs from the ninth, in having hairy stalks, and the under side of the leaves being downy. This grows naturally about *Paris*.

The eleventh sort is a biennial plant, which grows naturally in *France* and *Italy*. The lower leaves of this are rounded and eared somewhat like a kidney in shape, and are cut on their edges; but those on the stalks are divided into five parts, which end with many wing-shaped points; the stalks of this are shorter than those of the other sorts.

The twelfth sort grows naturally in *Egypt*. This is an annual plant, whose stalks are smooth a foot long, and decline toward the ground. The leaves stand upon pretty long foot-stalks, shaped like a hand, having five divisions which join at their base to the foot-stalk. The flowers come out single from the wings of the stalk, and at the top in clusters; they have pretty large acute empalements, they are small, and of a pale blue colour. These appear in *June*, and the seeds ripen in autumn.

The thirteenth sort grows naturally in the south of *France*. This is an annual plant, which has some resemblance of the former, but the stalks are longer and more branched; the leaves are cut into five obtuse lobes almost to the bottom, and are deeply cut on their side. The flowers stand upon very long foot-stalks; the empalement of the flower is large, prickly, and acute-pointed; the flowers are blue, and larger than those of the other sort. It flowers and ripens its seeds about the same time with that.

The fourteenth sort grows naturally at the *Cape of Good Hope*. This rises with a woody stalk ten or twelve feet high, sending out branches from the side; the stalks and branches are closely covered with hairs, and are garnished with hairy leaves, which are indented on the sides, so as to have the appearance of a trilobate leaf. The flowers come out from the side of the branches, upon foot-stalks an inch long; they are of a deep red colour, and shaped like those of the common Mallow, but are smaller. This plant

continues flowering great part of the year, which renders it valuable.

There are two other varieties of this plant, which have been mentioned by some authors as distinct species. The first is, *Alcea Africana frutescens, grossulariæ folio ampliore, unguibus florum atro-rubentibus. AÆ. Phil. 1729.* Shrubby African Vervain Mallow, with a larger Gooseberry leaf, and the bottoms of the flower of a dark red. The other is, *Alcea Africana frutescens, folio grossulariæ flore parvo rubro. Boerb. Ind. alt. 1. 272.* Shrubby African Vervain Mallow, with a Gooseberry leaf, and a small red flower. The leaves of the last appear very different from either of the other, being deeply divided into three lobes, which are also deeply indented, so that any person, upon seeing it, would suppose it to be a different species; but I have frequently raised all these, with some other intermediate varieties, from the seeds of one plant.

This sort is easily propagated by seeds, which, if sown on a common border in the spring, the plants will come up; but as it is too tender to live abroad in the winter, so when the plants are three or four inches high, they should be each planted into a separate pot, placing them in the shade till they have taken fresh root; then they may be removed to a sheltered situation, intermixing them with other hardy exotick plants, where they may remain till the frost comes on, when they should be removed into the greenhouse, and afterward treated in the same way as the hardy plants from the same country, always allowing them plenty of free air in mild weather.

The fifteenth sort grows naturally in most of the islands in the *West-Indies*. This is an annual plant, which rises about a foot high, sending out a few, short, woolly branches from the side, garnished with heart-shaped woolly leaves, which are notched on their edges, standing alternately upon pretty long foot-stalks. The flowers terminate the stalks in a close spike; they are small, and of a pale yellow colour. The seeds ripen in autumn.

This is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a new hot-bed, shading them until they have taken fresh root; then they must have free air admitted to them, in proportion to the warmth of the season, and the latter end of *June* they may be placed in the open air in a sheltered situation, where they will flower and produce ripe seeds.

There are some other sorts of Mallows, which are natives of this country, but as they are plants of no great beauty or use, it is needless to mention them in this place.

MALVA ROSEA. See *Alcea*.

MALUS, the Apple tree.

The Species are,

The branches spread, and are more depressed than those of the Pear tree. The flower consists of five leaves, which expand in form of a Rose. The fruit is hollowed about the foot-stalk, it is, for the most part, roundish and umbilicated at the top; is fleshy, and divided into five cells or partitions, in each of which is lodged one oblong seed.

The Species are,

1. MALUS foliis ovatis serratis, caule arborco. Wild Apple with a very four fruit, commonly called Crab.

2. MALUS foliis serrato-angulosis. Wild Crab of *Virginia*, with a sweet-scented flower.

3. MALUS foliis ovatis serratis, caule fruticoso. Dwarf Apple, commonly called Paradise Apple.

Of the first sort there are two varieties of fruit, one is white, and the other purple toward the sun, but these are accidental variations. There is also a variety of this with variegated leaves, which has been propagated in some of

the nurseries near *London*; but when the trees grow vigorous, their leaves soon become plain.

The second sort grows naturally in most parts of *North America*; where the inhabitants plant them for stocks to graft other sorts of Apples upon; the leaves of this are longer and narrower than any of the other sorts, and are cut into acute angles on their sides. The flowers of this have a fragrant odour, which perfumes the *American* woods at the time they appear.

The third sort is undoubtedly a distinct species from all the others, for it never rises to any height; the branches are weak, scarce able to support themselves, and this difference is permanent when raised from seeds.

There is a sort of Apple called the Fig Apple, which is common to *England* and *North America*, but the fruit is not greatly esteemed; however, as some persons are fond of variety, so I have mentioned it. The varieties of *French* Apples are,

Pomme de Rambour. The Rambour is a very large fruit, of a fine red next the sun, and striped with a pale or yellowish green. This ripens very early, commonly about the end of *August*, and soon grows mealy, therefore is not esteemed in *England*.

Pomme de Courpendu, the hanging Body. This is a very large Apple, of an oblong figure, having some irregular risings or angles, which run from the base to the crown; it is of a red cast on the side toward the sun, but pale on the other side; the foot-stalk is long and slender, so that the fruit is always hanging downward, which occasioned the *French* gardeners to give it this name.

The *Rennette-blanche*, or White Renette, or *French Renette*. This is a large fine fruit, of a pale green, and a roundish figure, having some small gray spots; the juice is sugary, and it is good for eating or baking; it will keep till after *Christmas* good.

The *Rennette-grise*: This is a middle sized fruit, shaped like the Golden Renette, but is of a deep gray colour on the side next the sun, but on the other side intermixed with yellow; it is a very juicy good Apple, of a quick flavour. It ripens in *October*, and will not keep long.

Pomme d'Api. This is a small hard fruit, of a bright purple colour on the side next the sun, and of a yellowish green on the other side; it is a very firm fruit, but hath not much flavour, so is only preserved by some persons by way of curiosity. It keeps a long time sound, and makes a variety in a dish of fruit.

Le Calville d'Automne, the Autumn Calville. This is a large fruit of an oblong figure, of a fine red colour toward the sun. The juice is vinous, and much esteemed by the *French*.

Fenouillet ou Pomme d'Anis, the Fennel, or Anise Apple. This is a middle sized fruit, a little longer than a Golden Pippin, of a grayish colour. The pulp is tender, and has a spicy taste like Anise-seed; the wood and the leaves are whitish.

Pomme violette, the Violet Apple. This is a pretty large fruit, of a pale green, striped with deep red to the sun. The juice is sugary.

The Crab, which is the first sort here mentioned, has been generally esteemed as the best stock for grafting Apples upon, being very hardy, and of long duration; but of late years there have been few persons who have been curious enough to raise these stocks, having commonly sown the kernels of all sorts of Cyder Apples for stocks without distinction, as these are much easier to procure than the other; so the gardeners generally call all those Crabs, which are produced from the kernel, and have not been grafted: but were the kernels of the Crabs sown, I should prefer those for stocks, because they are never so luxuriant in their

growth, as those from Apple kernels, and they will continue longer sound; besides, these will preserve some of the best sorts of Apples in their true size, colour, and flavour; whereas the other free stocks produce larger fruit, which are not so well tasted, nor will they keep so long.

The Paradise Apple some years ago was much esteemed for stocks to graft or bud upon, but these are not of long duration; nor will the trees grafted upon them ever grow to any size, unless they are planted so low as that the cyon may strike its root into the ground, when it will be equal to no stock, for the graft will draw its nourishment from the ground, so that it is only by way of curiosity, or for very small gardens, that these stocks are proper, since there can never be expected any considerable quantity of fruit from such trees.

There is another Apple which is called the *Dutch Paradise* Apple, much cultivated in the nurseries for grafting Apples upon, in order to have them dwarfs; and these will not decay or canker as the other, nor do they stint the grafts near so much, so are generally preferred for planting espaliers or dwarfs, being easily kept within the compass usually allotted to these trees.

Some persons have also made use of Codlin stocks to graft Apples upon, in order to make them dwarf; but the fruit which are upon these stocks, are not so firm, nor do they last so long, therefore the winter fruits should never be grafted upon these stocks:

The *Virginian Crab* tree with sweet flowers, is preserved by such persons as are curious in collecting great variety of trees; it may be propagated by budding or grafting it upon the common Crab or Apple tree; but it is somewhat tender while young, wherefore it should be planted in a warm situation, otherwise it will be subject to suffer by an extreme hard winter. The flowers of this tree are said to be exceeding sweet in *Virginia*, where it grows in the woods in great plenty; but I could not observe much scent in some of them which have flowered in *England*, so that I am in doubt whether the sort at present in the gardens is the same with that of *Virginia*.

The Fig Apple is supposed by many persons to be produced without a previous flower. But this opinion is rejected by more curious observers, who affirm there is a small flower precedes the fruit, which is very fugacious, seldom continuing above a day or two.

The other sorts which are above-mentioned, are what have been introduced from *France*; but there are not above two or three of them, which are much esteemed in *England*, viz. the *French Renette*, the *Rennette-grise*, and the Violet Apple; the other being early fruit, which do not keep long, and their flesh is generally mealy, so that they do not deserve to be propagated, as we have many better fruits in *England*; which I shall next mention.

The first Apple which is brought to the *London* markets, is the Codlin. This fruit is so well known in *England*, that it is needless to describe it.

The next is the *Margaret* Apple: this fruit is not so long, as the Codlin, of a middling size; the side next the sun changes to a faint red when ripe, the other side is of a pale green; the fruit is firm, of a quick pleasant taste, but doth not keep long.

The Summer Pearmain is an oblong fruit, striped with red next the sun; the flesh is soft, and in a short time is mealy, so that it is not greatly esteemed.

The *Kentish Fill Basket* is a species of Codlin, of a large size, longer shaped than the Codlin. This ripens a little later in the season, and is generally used for baking, &c.

The Transparent Apple: This was brought to *England* about the year 1724, and was esteemed a curiosity; it came from *Petersburgh*, where it is affirmed to be so transparent,

as that the kernels may be perfectly seen, when the Apple is held to the light; but in this country it is a meally intrepid fruit, so is not worth propagating.

Loan's Pearmain. This is a beautiful fruit to the sight, of a middling size; the side next the sun is of a fine red, striped with the same colour on the other; the flesh is vinous, but as it soon grows meally, it is not greatly esteemed.

The Quince Apple. This is a small fruit, seldom larger than the Golden Pippin, but is longer, and in shape like the Quince, especially toward the stalk; the side next the sun is of a russet colour, on the other side inclining to yellow. This is an excellent Apple for about three weeks in *September*, but it will not keep much longer.

The Golden Renette is a fruit so well known in *England*, as to need no description. This ripens about *Michaelmas*, and for about a month is a very good fruit, either for eating raw or baking.

The Aromatick Pippin is also a very good Apple. It is about the size of a Nonpareil, but a little longer; the side next the sun is of a bright russet colour; the flesh is breaking, and hath an aromatick flavour. It ripens in *October*.

The Hertfordshire Pearmain, by some called the *Winter Pearmain*. This is a good sized fruit, rather long than round, of a fine red next the sun, and striped with the same colour on the other side; the flesh is juicy, and stews well, but is not esteemed for eating by any nice palates. This is fit for use in *November* and *December*.

The Kentish Pippin is a large handsome fruit, of an oblong figure; the skin is of a pale green colour; the flesh is breaking, and full of juice, which is of a quick acid flavour. This is a very good kitchen fruit, and will keep till *February*.

The Holland Pippin is larger than the former; the fruit is somewhat longer, the skin of a darker green, and the flesh firm and juicy. This is a very good kitchen fruit, and will keep late in the season.

The Monstrous Renette is a very large Apple, of an oblong shape, turning red toward the sun, but of a dark green on the other side; the flesh is apt to be meally, so it is not much valued by those who are curious, and only preserved for the magnitude of the fruit.

The Embroidered Apple is a pretty large fruit, somewhat shaped like the Pearmain, but the stripes of red are very broad, from whence the gardeners have given it this title. It is a middling fruit, and is commonly used as a kitchen Apple, though there are many better.

The Royal Russet, by some called the *Leather Coat Russet*, on account of the deep russet colour of the skin. This is a large fair fruit, of an oblong figure, broad toward the base; the flesh is inclinable to yellow. This is one of the best kitchen Apples we have, and is a very great bearer; the trees grow large and handsome, and the fruit is in use from *October* till *April*, and is also a pleasant fruit to eat.

Wheeler's Russet is an Apple of a middling size, flat and round; the stalk is slender, the side next the sun of a light russet colour, the other side inclining to a pale yellow when ripe; the flesh is firm, and the juice has a very quick acid flavour; but it is an excellent kitchen fruit, and will keep a long time.

Pile's Russet is not quite so large as the former, but is of an oval figure, of a russet colour to the sun, and of a dark green on the other side. It is a very firm fruit, of a sharp acid flavour, but is much esteemed for baking, and will keep sound till *April*, or later, if they are well preserved.

The Nonpareil is a fruit pretty generally known in *England*, though there is another Apple which is frequently sold in the markets for it, which is what the *French* call *Haute-bonne*. This is a larger fairer fruit than the Nonpareil, more inclining to yellow; the russet colour brighter, and it is earlier ripe, and sooner gone: this is not so flat as

the true Nonpareil, nor is the juice so sharp, though it is good Apple in its season; but the Nonpareil is seldom ripe before *Christmas*, and where they are well preserved, they will keep till *May* perfectly sound. This is justly esteemed one of the best Apples that have been yet known.

The Golden Pippin is a fruit peculiar to *England*. There are few countries abroad where this succeeds well, nor do they produce so good fruit in many parts of *England*, as were to be wished. This is in some measure owing to their being grafted on free stocks, which enlarges the fruit, but renders it less valuable, because the flesh is not so firm, nor the flavour so quick, and it is apt to be dry and meally; therefore this should always be grafted upon the Crab stock, which will not canker like the others: and though the fruit will not be so fair to the sight, yet it will be better flavoured.

There are yet a great variety of Apples, which, being inferior to those here mentioned, I have omitted, as those which are here enumerated will be sufficient to furnish the table and the kitchen, during the whole season of these fruits; so that where these sorts are to be had, no person of taste will eat the other.

I shall here mention some of the Apples which are chiefly preferred for the making of cyder, though there are, in every cyder country, new sorts frequently obtained from the kernels; but those hereafter mentioned, have for some years been in the greatest esteem.

The Red-streak.

Devonshire Royal Wilding.

The Whitfour.

Hertfordshire Under Leaf.

John Apple, or Deux-annes.

Everlasting Hanger.

Gennet Moyle.

All the sorts of Apples are propagated by grafting or budding upon the stocks of the same kind, for they will not take upon any other sort of fruit tree. In the nurseries there are three sorts of stocks generally used, to graft Apples upon; the first are called free stocks, which are raised from the kernels of all sorts of Apples indifferently, and by some these are also termed Crab stocks; for all those trees which are produced from the seeds, before they are grafted, are termed Crabs without any distinction; but, as I before observed, I should always prefer such stocks as are raised from the kernels of Crabs, where they are pressed for verjuice; and I find several of the old writers on this subject of the same mind. *Mr. Austen*, who wrote a hundred years ago, says, *The stock which he accounts best for Apple grafts, is the Crab, which is better than sweeter Apple trees to graft on, because they are usually free from canker, and will become very large trees, and I conceive will last longer than stocks of sweeter Apples, and will make fruits more strong and hardy to endure frosts.* It is very certain, that by frequent grafting some sorts of Apples upon free stocks, the fruits have been rendered larger, but less firm, poignant, and of shorter duration.

The second sort of stocks is the *Dutch Creeper* before-mentioned; these are designed to stint the growth of the trees, and keep them within compass for dwarfs or espaliers.

The third sort is the *Paradise Apple*, which is a very low shrub, so only proper for trees which are kept in pots, by way of curiosity, for these do not continue long.

Some persons have made use of *Codlin* stocks for grafting of Apples, in order to stint their growth; but as these are commonly propagated by suckers, I would by no means advise the using of them; nor would I choose to raise the *Codlin* trees from suckers, but rather graft them upon Crab stocks, which will cause the fruit to be firmer, last longer, and have a sharper flavour. The trees so propagated will

ast much longer sound, and never put out suckers, as the Codlins always do, which, if not constantly taken off, will weaken the trees, and cause them to canker; and it is not only from the roots, but from the knots of their stems, there are generally a great number of strong shoots produced, which fill the trees with uselefs shoots, and render them un-fighly, and the fruit small and crumpled.

The method of raising stocks from the kernels of Crabs, or Apples, is, to procure them where they are pressed for verjuice or cyder, and after they are cleared of the pulp, they may be sown upon a bed of light earth, covering them over about half an inch thick with the same light earth; these may be sown in *November* or *December*, where the ground is dry, but in wet ground, it will be better to defer it till *February*; but then the seeds should be preserved in dry sand, and kept out of the reach of vermin, for if mice or rats can get to them, they will devour the seeds; there should also be care taken of the seeds, when they are sown, to protect them from these vermin, by setting traps to take them, &c. In the spring, when the plants begin to appear, they must be constantly kept clear from weeds, which, if suffered to grow, will soon over-top the plants, and spoil their growth; if these thrive well, some of them will be fit to transplant into the nursery the *October* following, for the sooner these seedling plants are removed from the seed-bed, the less danger there will be of their shooting down tap roots, which in fruit trees should always be prevented. The ground where these young stocks are to be planted, should be carefully digged, and cleansed from the roots of all bad weeds, and laid level; then the stocks should be planted in rows three feet asunder, and the plants one foot distance in the rows, closing the earth pretty fast to their roots; when the stocks are transplanted out of the seed-bed, the first autumn after sowing, they must not be headed, but such as are inclined to shoot downward, the tap root must be shortened, in order to force out horizontal roots: if the ground is pretty good in which these stocks are planted, and the weeds constantly cleared away, the stocks will make great progress, so that those which are intended for dwarfs, may be grafted the spring twelve months after they are planted out of the seed-bed; but those which are designed for standards will require two or three years more growth, before they will be fit to graft, by which time they will be upward of six feet high. The other necessary work to be observed in the culture of these trees, while they remain in the nursery, being exhibited under the article of NURSERY, I shall not repeat it in this place.

I shall next treat of the manner of planting such of these

trees as are designed for espaliers in the kitchen-garden, where, if there is an extent of ground, it will be proper to plant, not only such sorts as are for the use of the table, but also a quantity of trees to supply the kitchen; but where the kitchen-garden is small, the latter must be supplied from standard trees, either from the orchard, or wherever they are planted; but as many of these kitchen Apples are large, and hang late in the autumn upon the trees, they will be much more exposed to the strong winds, on standard trees, than in espaliers, whereby many of the fruit will be blown down before they are ripe, and others bruised, so as to prevent their keeping; therefore where it can be done, I should always prefer the planting them in espaliers.

The distance which I should choose to allow these trees, should not be less than twenty-five, or thirty feet, for such sorts as are of moderate growth (if upon Crab or free stocks) but the larger growing sorts should not be allowed less room than thirty-five feet, which will be found full near enough, if the ground is good, and the trees properly trained; for as the branches of these trees should not be shortened, but trained at their full length, so in a few years they will be found to meet. Indeed, at the first planting, the distance will appear so great, to those persons who have not observed the vigorous growth of these trees, that they will suppose they never can extend their branches so far, as to cover the espalier; but if these persons will but observe the growth of standard trees of the same kinds, and see how wide their branches are extended on every side, they may be soon convinced, that as these espalier trees are allowed to spread but on two sides, they will of course make more progress, as the whole nourishment of the root will be employed in these side branches, than where there is a greater number of branches on every side of the tree, which are to be supplied with the same nourishment.

The next thing to be observed is the making choice of such sorts of fruits as grow nearly alike, to plant in the same espalier. This is of great consequence, because of the distance they are to be placed, otherwise those sorts which make the largest shoots, may be allowed less room to spread than those of smaller growth; besides, when all the trees in one espalier are nearly equal in growth, they will have a better appearance than when some are tall, and others short; but for the better instruction of those persons who are not conversant in these things, I shall divide the sorts of Apples into three classes, according to their different growths.

Largest growing tree.

All the sorts of Pearmains.
Kentish Pippin.
Holland Pippin.
 Monstrous Renette.
 Royal Ruffet.
Wheeler's Ruffet.
Pile's Ruffet.
 Nonpareil.
 Violet Apple.

Middle growing tree.

Codlin.
 Margaret Apple.
 Golden Renette.
 Aromatick Pippin.
 Embroidered Apple.
 Renette Grise.

Smallest growing tree.

Quince Apple.
 Transparent Apple.
 Golden Pippin.
Pomme d'Api.
Fenouillet, or Anise Apple.

N. B. These are all supposed to be grafted on the same sort of stocks.

If these Apples are grafted upon Crab stocks, I would willingly place them at the following distance from each other, especially where the soil is good, viz. the largest growing trees at forty feet, the middle growing at thirty

feet, and the small growing at twenty feet, which, from constant experience, I find to be full near enough; for in many places, where I have planted the trees at twenty-four feet distance, the trees have grown so strong, as that in seven years

years their branches have met; and in some places where every other tree hath been taken up, the branches have almost joined in seven years after; therefore it will be much the better way to plant these trees at a proper distance at first, and between these to plant some Dwarf Cherries, Currants, or other sort of fruit, to bear for a few years, which may be cut away when the Apple trees have extended their branches to them; for when the Apple trees are planted nearer together, few persons care to cut down the trees when they are fruitful, so that they are obliged to use the knife, saw, and chisel, more than is proper for the future good of the trees; and many times, where persons are inclinable to take away part of their trees, the distances will be often so irregular (where there was not this consideration in planting,) as to render the espalier unsightly.

When the trees are upon the *Dutch* dwarf stock, the distance should be for the larger growing trees thirty feet; twenty-five, for those of middle growth; and the smallest twenty feet, which will be found full near, where the trees thrive well.

The next is the choice of the trees, which should not be more than two years growth from the graft, but those of one year should be preferred; be careful that their stocks are young, sound, and smooth, free from canker, which have not been cut down in the nursery; when they are taken up, all the small fibres should be entirely cut off from their roots, which, if left on, will turn mouldy and decay, so will obstruct the new fibres in their growth; the extreme parts of the roots must be shortened, and all bruised roots cut off; and if there are any misplaced roots, which cross each other, they should also be cut away. As to the pruning of the head of these trees, there need be nothing more done, than to cut off any branches, which are so situated, as that they cannot be trained to the line of the espalier; in the planting there must be care taken not to place their roots too deep in the ground, especially if the soil is moist, but rather raise them on a little hill, which will be necessary to allow for the raising of the borders afterward. The best season for planting these trees (in all soils which are not very moist) is, from *October*, to the middle, or latter end of *November*, according as the season continues mild; but so soon as the leaves fall, they may be removed with great safety. After the trees are planted, it will be proper to place down a stake to each tree, to which the branches should be fastened, to prevent the winds from shaking or loosening their roots, which will destroy the young fibres; for when these trees are planted pretty early in the autumn, they will very soon push out a great number of new fibres, which, being very tender, are soon broken, so the trees are greatly injured thereby. If the winter should prove severe, it will be proper to lay some rotten dung, tanners bark, or some sort of mulch, about their roots, to prevent the frost from penetrating of the ground, which might damage these tender fibres; but I would not advise the laying of this mulch before the frost begins, for if it is laid over the roots soon after the trees are planted (as is often practised), it will prevent the moisture entering the ground, and do much harm to the trees.

The following spring, before the trees begin to push, there should be two or three short stakes put down on each side of the tree, to which the branches should be fastened down as horizontally as possible, never cutting them down, as is by some practised, for there will be no danger of their putting out branches enough to furnish the espalier, if the trees are once well established in their new quarters.

In the pruning of these trees, the chief point is, never to shorten any of the branches, unless there is an absolute want of shoots to fill the places of the espalier; for where the knife is much used, it only multiplies useless shoots, and

prevents their fruiting; so that the best method to manage these trees is, to go over them three or four times in the growing season, and rub off all such shoots as are irregularly produced, and train the others down to the stakes, in the position they are to remain; if this is carefully performed in summer, there will be little left to be done in the winter, and by bending of their shoots from time to time, as they are produced, there will be no occasion to use force to bring them down, nor any danger of breaking the branches. The distance which these branches should be trained from each other, for the largest sorts of fruit, should be about seven or eight inches, and for the smaller, five or six. If these plain instructions are followed, it will save much unnecessary labour of pruning, and the trees will, at all times, make a handsome appearance; whereas when they are suffered to grow rude in summer, there will be much difficulty to bring down their shoots without breaking, especially if they are grown stubborn. All the sorts of Apples produce their fruit upon cursons, or spurs, so that these should never be cut off, for they will continue fruitful a great number of years.

The method of making the espaliers having been already exhibited under that article, I need not repeat it here, but only observe, that it will be best to defer making the espalier, till the trees have had three or four years growth, for before that time, the branches may be supported by a few upright stakes, so that there will be no necessity to make the espalier, until there are sufficient branches to furnish all the lower part.

I shall now treat of the method to plant orchards, so as to have them produce the greatest profit. And first, in the choice of the soil and situation for an orchard: the best is that on the ascent of gentle hills, facing the south, or south-east, but this ascent must not be too steep, lest the earth should be washed down by hasty rains. There are many persons who prefer low situations at the foot of hills, but I am thoroughly convinced from experience, that all bottoms where there are hills on every side, are very improper for this purpose; for the air is drawn down in strong currents, which, being pent in on every side, renders these bottoms much colder, than the open situations; and during the winter and spring, these bottoms are very damp, and unhealthy to all vegetables; therefore the gentle rise of a hill, fully exposed to the sun and air, is by much the best situation. As to the soil, a gentle hazel loam, which is easy to work, and that doth not detain the wet, is the best; if this happens to be three feet deep, it will be the better for the growth of the trees, for although these trees will grow upon very strong land, yet they are seldom so thriving, nor are their fruit so well flavoured, as those which grow on a gentle soil; and on the other hand, these trees will not do well upon a very dry gravel, or sand, therefore those soils should never be made choice of for orchards.

The ground intended to be planted should be well prepared the year before, by ploughing it thoroughly, and if some dung is laid upon it the year before, it will be of great service to the trees; if in the precedent spring a crop of Peas or Beans is planted on the ground (provided they are sown or planted in rows, at a proper distance, so as that the ground between them is horse-hoed), it will destroy the weeds, and loosen the ground, so that will be a good preparation for the trees, for the earth cannot be too much wrought, or pulverized for this purpose; these crops will be taken off the ground before the season for planting of these trees, which should be performed when the trees begin to shed their leaves.

In choosing of the trees, I would advise the taking such as are but of two years growth from the graft, and never to plant old trees, or such as are grafted upon old stocks; for

for it is losing of time to plant such, young trees being always more certain to grow, and make a much greater progress than those which are old. As to pruning of the roots, it must be done in the same manner as hath been already directed for the espalier trees; and in pruning their heads, little more is necessary than to cut such branches as are ill placed, or that cross each other, for I do not approve the heading of them down, as is by some often practised, to the loss of many of their trees.

The distance which these trees should be planted, where the soil is good, must be fifty or sixty feet; and where the soil is not so good, forty feet may be sufficient; but nothing can be of worse consequence, than the crowding trees too close together in orchards: for although there be some persons who may imagine this distance too great, yet I am sure, when they have thoroughly considered the advantages attending this practice, they will agree with me. Nor is it my own authority, for in many of the old writers on this subject, who have wrote from experience, there is often mention made of the necessity for allowing a proper distance to the fruit trees in orchards; particularly *Austen*, who says, *He should choose to prescribe the planting these trees fourteen or sixteen yards asunder; for both trees and fruits have many great advantages, if planted a good distance from one another.* One advantage he mentions is, *The sun refreshes every tree, the roots, body, and branches, with the blossoms and fruits; whereby trees bring forth more fruit, and those fairer and better.* Another advantage he mentions is, *That when trees are planted at a large distance, much profit may be made of the ground under and about these trees, by cultivating garden stuff, commodious as well for sale as housekeeping; as also Gooseberries, Raspberries, Currants, and Strawberries, may be there planted.* Again he says, *When trees have room to spread, they will grow very large and great; and the consequences of that will be, not only multitudes of fruits, but also long lasting, and these two are no small advantages.* For, says he, *men are mistaken, when they say, The more trees in an orchard, the more fruits; for one or two larger trees, which have room to spread, will bear more fruit than six or ten (it may be) of those that grow near together, and crowd one another.* Again he says, *Let men but observe, and take notice of some Apple trees, that grow a great distance from other trees, and have room enough to spread both their roots and branches, and they shall see, that one of those trees (being come to full growth) hath a larger head, and more boughs and branches, than (it may be) four, or six, or more, of those which grow near together, although of the same age.*

And Mr. *Lawson*, an ancient planter, advises to plant Apple trees twenty yards asunder. As the two authors above quoted have written the best upon this subject, and seem to have had more experience than any of the writers I have seen, I have made use of them as authorities to confirm what I have advanced; though the fact is so obvious to every person who will make the least reflection, that there needs no other proof.

When the trees are planted, they should be staked, to prevent their being shaken, or blown out of the ground by strong winds; but in doing of this, there should be particular care taken, to put either straw, haybands, or woollen cloth, between the trees and the stakes, to prevent the trees from being rubbed and bruised by the shaking against the stakes, for if their bark should be rubbed off, it will occasion such great wounds, as not to be healed over in several years, if they ever recover it.

If the winter should prove very severe, it will be proper to cover the surface of the ground about their roots with some mulch, to prevent the frost from penetrating the ground, which will injure the young fibres; but this mulch should not be laid on too soon, as hath been before mentioned, lest the moisture should be prevented from soaking

down to the roots of the trees, nor should it lie on too long in the spring, for the same reason: therefore where persons will be at the trouble to lay it on in frosty weather, and remove it again after the frost is over, that the wet in *February* may have free access to the roots of the trees; and if *March* should prove dry, with sharp north or east winds, which often happens, it will be proper to cover the ground again with the mulch, to prevent the winds from penetrating and drying the ground, which will be of singular service to the trees. But I am aware, that this will be objected to by many, on account of the trouble, which may appear to be great; but when it is considered, how much of this business may be done by a single person in a short time, it can have little force, and the benefit which the trees will receive by this management, will greatly recompense the trouble and expence.

As these trees must be constantly fenced from cattle, it will be the best way to keep the land in tillage, for by constant ploughing or digging of the ground, the roots of the trees will be encouraged, and they will make the more progress in their growth; but where this is done, whatever crops are sown or planted, should not be too near the trees, lest the nourishment should be drawn away from them; and if the ground is ploughed there must be care taken not to go too near the stems of the trees, whereby their roots would be injured, or the bark of their stems rubbed off; but it will be of great service to dig the ground about the trees, where the plough doth not come, every spring or autumn, for five or six years after planting, by which time their roots will have extended themselves to a greater distance.

It is a common practice in many parts of *England*, to lay the ground down for pasture, after the trees are grown pretty large in their orchards; but this is by no means advisable, for I have frequently seen trees of above twenty years growth, almost destroyed by horses, in the compass of one week; and if sheep are put into orchards, they will constantly rub their bodies against the stems of the trees, and their grease sticking to the bark, will stint their growth, and in time will spoil them; therefore wherever orchards are planted, it will be much the better method to keep the ground ploughed or dug annually, and such crops put on the ground, as will not draw too much nourishment from the trees.

In pruning of orchard trees nothing more should be done, but to cut out all those branches which cross each other, which, if left, would rub and tear off the bark from each other, as also decayed branches, but never shorten any of their shoots. If suckers, or shoots from their stems, should come out, they must be entirely taken off, and when any branches are broken by the wind, they should be cut off, either down to the division of the branch, or close to the stem from whence it was produced; the best time for this work is in *November*, for it should not be done in frosty weather, nor in the spring, when the sap begins to be in motion.

The best method to keep Apples for winter use is, to let them hang upon the trees, until there is danger of frost; to gather them in dry weather, and then lay them in large heaps to sweat for a month or six weeks; afterward look them over carefully, taking out all such as have appearance of decay, wiping all the sound fruit dry, and pack them up in large oil jars, which have been thoroughly scalded and dry, stopping them down close, to exclude the external air; if this is duly observed, the fruit will keep sound a long time, and their flesh will be plump, for when they are exposed to the air, their skins will shrink, and their pulp will be soft.

- MALUS ARMENIACA.** See Armeniaca.
MALUS AURANTIA. See Aurantia.
MALUS LIMONIA. See Limonia.
MALUS MEDICA. See Citreum.
MALUS PERSICA. See Persica.
MALUS PUNICA. See Punica.
MAMMEA. Plum. Nov. Gen. 44. tab. 4. The Mammee tree.

The Characters are,

The flower has four large concave petals, which spread open. It hath many awl-shaped stamina, and in the center a roundish germen, which afterward turns to a large fleshy fruit, of a spherical figure, inclosing one, two, or three large, almost oval stones.

There is but one Species of this tree known, viz.

MAMMEA staminibus flore brevioribus. Lin. Sp. 512. Mammee with the stamina shorter than the flower.

This tree, in the *West-Indies*, grows to the height of sixty or seventy feet; the leaves are large and stiff, and continue green all the year; the fruit is as large as a man's fist; when ripe, it is of a yellowish green colour, and is very grateful to the taste. It grows in great plenty in the *Spanish West-Indies*, where the fruit is generally sold in their markets, and is esteemed one of the best fruits of the country. It also grows on the hills of *Jamaica*, and has been transplanted into most of the *Caribbee Islands*, where it thrives exceeding well.

In *England* there are few of these plants, but none of any size. The plants may be propagated by planting the stones, which are often brought from the *West-Indies* (but these stones should be fresh, otherwise they will not grow); these should be put into pots, and plunged into a hot-bed of tanners bark. In about two months the plants will appear above ground, after which, in warm weather, the glasses of the hot-bed should be raised to let in the fresh air. In three months after the roots of the plants will have filled the pots, when they should be carefully taken out of the pots, and the outer shell of the nut taken off with all possible care not to injure the roots of the plants; then they must be new potted, and plunged again into the bark-bed, observing to water and shade them until they have taken root, after which they should have air and water in proportion to the warmth of the season. In this bed they may remain till *Michaelmas*, when they must be removed into the bark-stove, where they must be constantly kept, and may be treated after the manner directed for the Coffee tree.

If, when the stones of this fruit are brought over, they are put into the tan-bed, under the bottom of any of the pots, they will sprout sooner than those which are planted in the earth.

MANCANILLA. See Hippomane.

MANDRAGORA. Tourn. Inst. R. H. 16. tab. 12. Mandrake.

The Characters are,

The flower hath one erect bell-shaped petal, which is a little larger than the empalement. It has five awl-shaped stamina, which are arched and hairy at their base. In the center is situated a roundish germen, which afterward turns to a large round berry with two cells, having a fleshy receptacle convex on each side, filled with kidney-shaped seeds.

We have but one Species of this genus at present in the *English* gardens, viz.

MANDRAGORA. Hort. Cliff. 51. Mandrake with a round fruit.

This plant grows naturally in *Spain*, *Portugal*, *Italy*, and the *Levant*, but is preserved here in the gardens of the curious. It hath a long taper root shaped like a Parsnep, which runs three or four feet deep in the ground; it is sometimes single, and at others divided into two or three branches, al-

most of the colour of Parsnep, but a little darker; from this arises a circle of leaves, which at first stand erect, but, when grown to their full size, spread open, and lie upon the ground; they are more than a foot in length, and four or five inches broad in the middle, of a dark green colour, and a fetid scent. These rise immediately from the crown of the root, without any foot-stalk; between them come out the flowers, each standing upon a separate foot-stalk about three inches long, which also arise immediately from the root; the flowers are five-cornered, of an herbaceous white colour; spreading open at the top like a Primrose, having five hairy stamina, with a globular germen in the center; supporting an awl-shaped style. The germen afterward turns to a globular soft berry lying upon the leaves, which, when fully grown, is as large as a nutmeg, of a yellowish-green colour when ripe, full of pulp, in which the kidney-shaped seeds are lodged. It flowers in *March*, and the seeds are ripe in *July*.

This plant is propagated by seeds, which should be sown upon a bed of light earth soon after they are ripe, for if they are kept until the spring, they seldom succeed well; but those which are sown in autumn will come up in the spring, when they should be carefully cleared from weeds. In this bed they should remain till the autumn, when they should be taken up very carefully, and transplanted into the places where they are to remain, which should be in a light deep soil; for their roots always run downward very deep; so that if the soil be wet, they are often rotted in winter; and if it be too near the gravel or chalk, they seldom thrive well; but if the soil is good and they are not disturbed, the plants will grow to a large size in a few years, and will produce great quantities of flowers and fruit, and will abide a great many years.

I have been informed by some persons of credit, that one of these roots will remain sound fifty or sixty years, and be as vigorous as a young plant. I know some plants myself, which are now above forty years old, and in great vigour, which may continue so many years longer, as there are no signs of their decay; but they should never be removed after their roots have arrived to any considerable size, which would break their lower fibres, and so stint the plants, as that if they live they will not recover their former strength in two or three years.

As to the feigned resemblance of a human form, which the roots of this plant are said to carry, it is all imposture, owing to the cunning of quacks and mountebanks, who deceive the populace and the ignorant with fictitious images shaped from the fresh roots of Briony and other plants: and what is reported as to the manner of rooting up this plant, by tying a dog thereto, to prevent the certain death of the person who should dare to attempt it, and the groans it emits upon the force offered, &c. is all a ridiculous fable: for I have taken up several large roots of this plant, some of which have been transplanted into other places, but could never observe any accident which attended it, nor was there any difference from that of other deep rooting plants.

MANIHOT. See Jatropha.

MAPLE. See Acer.

MARACQCK. See Passiflora.

MARANTA. Plum. Nov. Gen. 16. tab. 36. Indian Arrow-root.

The Characters are,

The flower hath one petal, which is of the grinning kind, with an oblong compressed tube, cut into six small segments, representing a lip flower. It has one membranaceous stamina, appearing like a segment of the petal, and a roundish germen situated under the flower, which afterward turns to a roundish three-cornered capsule with three valves, containing one hard rough seed.

The Species are,

1. *MARANTA segmentis petalorum dentatis*. Indian Arrow-root, with the segments of the flower indented.

2. *MARANTA segmentis petalorum integerrimis*. Indian Arrow-root, with the segments of the petals entire; called Indian Arrow-root.

The first sort was discovered by father Plumier in some of the French settlements in America; and the late Dr. William Houstoun, found the same sort growing in plenty near La Vera Cruz in New Spain.

This hath a thick, fleshy, creeping root, which is very full of knots, from which arise many smooth leaves, six or seven inches long and three broad in the middle, terminating in points, which arise immediately from the root; between these come out the stalks, which rise near two feet high, and divide upward into two or three smaller, garnished at each joint with one leaf of the same shape with the lower, but are smaller. The stalks are terminated by a loose spike of small white flowers, standing upon long foot-stalks. The flowers are cut into six narrow segments, which are indented on their edges, and sit upon the germen, which afterward turns to a roundish three-corned capsule, inclosing one hard rough seed.

The other sort was brought from some of the Spanish settlements in America, into the islands of Barbadoes and Jamaica, where it is cultivated in their gardens as a medicinal plant, being a sovereign remedy to cure the bite of wasps, and to extract the poison of the Manchineel tree. The Indians apply the root to expel the poison of their arrows, which they use with great success. They take up the roots, and after cleansing them from dirt, they mash them, and apply it as a poultice to the wounded part, which draws out the poison, and heals the wound. It will also stop a gangrene, if it be applied before it is gone too far, so that it is a very valuable plant.

This sort is very like the first, but the flowers are smaller, and the segments of the petals are entire, in which their principal difference consists.

These plants being natives of a warm country, are tender, therefore will not live in this climate, unless they are preserved in stoves. They propagate fast by their creeping roots, which should be parted the middle of March, just before they begin to push out new leaves, and planted in pots filled with light earth, then plunged into a moderate hot-bed of tanners bark, observing now and then to refresh them with water; but it must not be given to them in large quantities, for too much moisture will soon rot them, when they are in an unactive state. When the green leaves appear above ground, the plants will require frequently to be watered, and should have free air admitted to them every day, in proportion to the warmth of the season and the heat of the bed in which they are placed. Where they are constantly kept in the tan-bed, and have proper air and moisture, they will thrive, so as from a small root to fill the pots, in which they were planted, in one summer. About Michaelmas the first sort will begin to decay, and in a short time after the leaves will die to the ground, but the pots must be continued all the winter in the bark-bed, otherwise the roots will perish; for although they are in an unactive state, yet they will not keep from shrinking very long, when taken out of the ground; and if the pots are taken out of the tan, and placed in any dry part of the stove, the roots often shrivel and decay; but when they are continued in the tan, they should have but little water given to them when their leaves are decayed, lest it rot them.

MARJORAM. See Origanum.

MARLE is a kind of clay, which is become fatter, and of a more enriching quality, by a better fermentation, and by its having lain so deep in the earth as not

to have spent or weakened its fertilizing quality by any product.

Marles are of different qualities in different counties of England. There are reckoned to be four sorts of marles in *Suffex*, a gray, a blue, a yellow, and a red; of these the blue is accounted the best, the yellow the next, and the gray the next to that; and as for the red, that is the least valuable.

In *Cheshire* they reckon six sorts of marle:

1. The cowshut marle, which is of a brownish colour, with blue veins in it, and little lumps of chalk or lime stone; it is commonly found under clay, or low black land, seven or eight feet deep, and is very hard to dig.

2. Stone, slate, or flag marle, which is a kind of soft stone, or rather slate of a blue or bluish colour, that will easily dissolve with frost or rain. This is found near rivers, and the sides of hills, and is a very lasting sort of marle.

3. Peat marle, or delving marle, which is close, strong, and very fat, of a brown colour, and is found on the sides of hills, and in wet or boggy grounds, which have a light sand in them about two feet or a yard deep.

4. Clay marle; this resembles clay, and is pretty near akin to it, but is fatter, and sometimes mixed with chalk stones.

5. Steel marle, which lies commonly in the bottom of pits that are dug, and is of itself apt to break into cubical bits; this is sometimes under sandy land.

6. Paper marle, which resembles leaves or pieces of brown paper, but something of a lighter colour; this lies near coals.

The properties of any sorts of marles, and by which the goodness of them may be best known, are better judged of by their purity and uncompoundness, than their colour: as if it will break in pieces like dice, or into thin flakes, or is smooth like lead ore, and is without a mixture of gravel or sand; if it will shake like slate stones, and shatter after wet, or will turn to dust when it has been exposed to the sun; or will not hang and stick together when it is thoroughly dry, like tough clay; but is fat and tender, and will open the land it is laid on, and not bind; it may be taken for granted, that it will be beneficial to it.

Marles do not make so good an improvement of lands the first year as afterwards.

The quantity of marle ought to be in proportion to the depth of the earth, for over marling has often proved of worse consequence than under marling, especially where the land is strong; for by laying it in too great quantities, or often repeating the marling, the land has become so strong and bound so closely, as to detain the wet like a dish, so that the owners have been obliged to drain the ground at a great expence; but in sandy land there can be no danger in laying on a great quantity, or repeating it often, for it is one of the best dressings for such land.

MARRUBIASTRUM. See Sideritis.

MARRUBIUM. *Tourn. Inst. R. H. 192. tab. 91.* Horehound.

The Characters are,

The flower is of the lip kind, with a cylindrical tube, divided into two lips. It has four stamina which are under the upper lip, two of which are a little longer than the other. It hath a four-pointed germen, which afterward turns to four oblong seeds, sitting in the empalement.

The Species are,

1. *MARRUBIUM dentibus calycinis setaceis uncinatis*. Hort. Cliff. 312. Common white Horehound.

2. *MARRUBIUM foliis ovato-lanceolatis serratis, calycum denticulis setaceis*, Hort. Cliff. 311. Broad-leaved, foreign, white Horehound.

3. *MARRUBIUM foliis lanceolatis dentatis, verticillis minoribus, dentibus calycinis setaceis erectis.* Narrow-leaved, foreign, white Horehound.

4. *MARRUBIUM foliis cuneiformibus, verticillis involucri destitutis.* Hort. Cliff. 311. Horehound called Madwort, with leaves which are deeply cut.

5. *MARRUBIUM dentibus calycinis setaceis rectis villosis.* Hort. Cliff. 312. Low Spanish Horehound, with silver-coloured fattiny leaves.

6. *MARRUBIUM foliis subovatis lanatis supernè emarginato-crenatis, denticulis calycinis subulatis.* Hort. Cliff. 312. The whitest and most hairy Horehound.

7. *MARRUBIUM calycum limbis patentibus, denticulis acutis.* Hort. Cliff. 312. Round-leaved Spanish Horehound.

8. *MARRUBIUM foliis subovatis tomentosis supernè serratis, denticulis calycinis setaceis erectis.* Whitest round-leaved Horehound.

9. *MARRUBIUM calycum limbis planis villosis, foliis orbiculatis rugosis, caule herbaceo.* Spanish bastard Dittany, with rough-curved leaves.

10. *MARRUBIUM calycum limbis planis villosis, foliis cordatis rugosis incanis, caule suffruticoso.* Spanish bastard Dittany, with a very large hoary leaf.

11. *MARRUBIUM calycum limbis planis villosis, foliis cordatis, caule fruticoso.* Hort. Cliff. 312. Whorled, unfavoury, bastard Dittany.

12. *MARRUBIUM calycum limbis tubo longioribus membranaceis, angulis majoribus rotundatis.* Lin. Sp. Plant. 584. Bastard Dittany, with an empalement like *Molucca* Baum.

The first sort is the Prassium, or white Horehound of the shops. This grows naturally in many parts of *England*, so is seldom propagated in gardens. It hath a ligneous fibrous root, from which come out many square stalks two feet in length, garnished with hoary roundish leaves, indented on the edges, placed opposite. The flowers grow in very thick whorls round the stalks at each joint; they are small, white, and of the lip kind, standing in stiff hoary empalements, cut into ten parts at the top, which end in stiff bristles; these are succeeded by four oblong black seeds, sitting in the empalement.

The second sort grows naturally in *Italy* and *Sicily*. This rises with square stalks near three feet high, which branch much more than the first; the leaves are rounder, whiter, and stand farther asunder; the whorls of flowers are not so large, but the flowers have longer tubes.

The third sort grows naturally in *Spain* and *Portugal*. This rises with slender hoary stalks three feet high; the leaves are very hoary, much longer and narrower than those of the second; the whorls of flowers are smaller, the bristly indentures of the empalement are longer and erect; the whole plant has an agreeable flavour.

The fourth sort grows naturally in *Spain* and *Italy*. This is a biennial plant, whose stalks are about the same length as those of the first; the leaves are wedge-shaped, hoary, and obtusely indented; the whorls of flowers are small, and have no covers. The flowers stand looser in the whorls, and the cuts of the empalement end in very stiff prickles which spread open; the flowers are purple, and larger than those of the first sort.

The fifth sort grows naturally in *Spain*, and also in the islands of the *Archipelago*. The stalks of this are seldom above eight or nine inches long, covered with a soft hoary down; the leaves are small, roundish, very soft to the touch, and indented on the edges. The whorls of flowers are small, very downy and white.

The sixth sort grows naturally in *Spain*. This hath stalks about the same length as the first; the leaves are nearly oval, woolly, and crenated toward the top, and the empalement of the flowers are awl-shaped.

The seventh sort grows naturally in *Spain*. The stalks of this grow more erect than those of the common sort; the leaves are rounder and more sawed on the edges; the empalement of the flowers spread open, ending in acute segments. The flowers are like those of the common sort; the whole plant is very hoary.

The eighth sort grows naturally in the *Levant*. The stalks of this sort are very woolly; the leaves are almost oval, thick, and indented on their edges toward the top; their foot-stalks are broad, the whorls of flowers are large, and the indentures of the empalements end in stiff bristles; the whole plant is very white.

The ninth sort grows naturally in *Spain* and *Sicily*. This sends out many stiff roundish stalks, which rise more than two feet high, covered with a white cottony down; the leaves are almost round, rough on their upper side, and woolly on their under; the whorls of flowers are large, the borders of the empalement are flat and hairy; the tube of the flower is scarce so long as the empalement, so the two lips are but just visible.

The tenth sort grows naturally in *Spain*. The stalks of this are a little shrubby, and rise near three feet high, dividing into small branches; the leaves are heart-shaped and rough on their upper side, but hoary on their under; the whorls of flowers are large, the borders of the empalements flat and hairy; the tube of the flower is longer, and the flowers are larger than those of the former sort; they are of a pale purple colour, and their upper lips are erect.

The eleventh sort grows naturally in *Sicily*, and the islands of the *Archipelago*. This rises with a shrubby stalk two feet high, which divides into many branches, garnished with small heart-shaped leaves, sitting pretty close to the stalks; the whorls of flowers are not so large as those of the two former sorts. The rim of the empalements are flat. The flowers are white, and the whole plant is very hoary.

The twelfth sort grows naturally in *Crete*. This hath very woolly stalks, which rise two feet high, garnished with woolly heart-shaped leaves. The whorls of flowers are large, the borders of the empalements flat, and cut into many segments, which are membranaceous, angular, and rounded at the top. The flowers are small, of a pale purple colour, but scarce appear out of their empalements, and their upper lips are erect.

The fourth sort is supposed to be *Galen's* Madwort. This was by the ancients greatly recommended for its efficacy in curing of madness, and some few of the moderns have prescribed it in the same disorder, but at present it is seldom used.

All these plants are preserved in botanick gardens for the sake of variety, but there are not above two of the sorts which are cultivated in other gardens; these are the eleventh and twelfth sorts, whose stalks are shrubby, and the plants very hoary, so make a variety when intermixed with other plants; these very rarely produce seeds in *England*, so are propagated by cuttings, which, if planted in a shady border the middle of *April*, will take root very freely.

They are somewhat tender, so in very severe winters should be screened from the hard frosts, especially those plants which grow in good ground, and are luxuriant; their branches are more replete with juice, so very liable to suffer by cold; but when they are in a poor, dry, rubbishy soil, the shoots will be short, firm, and dry, so are seldom injured by the cold, and these plants will continue much longer than those in better ground.

The other sorts are easily propagated by seeds, which should be sown on a bed of dry earth in the spring; when the plants come up, they must be kept clean from weeds, and where they are too close they should be thinned, leaving them a foot and a half asunder, that their branches

may have room to spread, after this they require no other culture; they may also be propagated by cuttings in the same manner as the two other sorts.

MARRUBIUM NIGRUM. See Ballote.

MARTAGON. See Lilium.

MARTYNIA. *Houft. Gen. Nov. Martyn. Dec. 1. 42.*

The Characters are,

The flower hath one bell-shaped petal, and is of the ringent kind, with a swelling tube, at the base of which is situated a gibbous nectarium. It hath four slender incurved stamina, which are inflexed into each other, and an oblong germen situated under the flower. The empalement afterward turns to an oblong gibbous capsule, which divides into two parts, including a hard nut shaped like the body of a stag beetle, with two incurved strong horns at the end, having four cells, two of which are generally barren, the other two have one oblong seed in each.

The Species are;

1. MARTYNIA caule ramoso, foliis angulatis. *Lin. Sp. Plant.* 618. Martynia with a branching stalk, and angular leaves.
2. MARTYNIA caule simplici, foliis serratis. *Lin. Sp. Plant.* 618. Martynia with a single stalk, and sawed leaves.
3. MARTYNIA caule ramoso, foliis cordato-ovatis pilosis. *Plat. 286.* Martynia with a branching stalk, and oval, heart-shaped, hairy leaves.

The first sort was discovered by the late Dr. William Housoun, near La Vera Cruz, in New Spain.

This rises with a strong herbaceous stalk near three feet high, which divides upward into two or three large branches, garnished with oblong, oval, hairy, viscous leaves, cut into angles on their sides. The flowers are produced in short spikes, from the end of the branches; they are shaped like those of the common Foxglove, but are of a paler purple colour, and are succeeded by oblong oval capsules, which are thick, tough, and clammy; when ripe, divide into two parts, and drop off, leaving a large hard nut hanging on the plant, about the size and much of the same form as the stag beetle, with two strong crooked horns at the end. The nut has two deep longitudinal furrows on the sides, and several smaller crossing each other in the middle, and is so hard, that it is with difficulty cut open, without injuring of the seeds; within are four oblong cells, two of which have a single oblong seed in each, but the other two are abortive. If the plants are brought forward in the spring, they will begin to shew their flowers in July, which are first produced at the division of the branches, and afterward at the extremity of each branch, so there will be a succession of flowers on the same plant till the end of October, when the plants decay.

The second sort was discovered by Mr. Robert Millar, growing naturally about Carthagena, in New Spain. This hath a perennial root, and an annual stalk. The roots of this plant are thick, fleshy, and divided into scaly knots, somewhat like those of Toothwort, from which arise several single, fleshy, succulent stalks, about a foot high, of a purplish colour, garnished with oblong thick leaves, whose base fits close to the stalk; they are sawed on their edges, rough on their upper side, where they are of a dark green, but their under side is purplish. The stalk is terminated by a spike of blue flowers, which are bell-shaped, and do not spread open at the rim so much as the former sort; these are not succeeded by seeds in England.

The third sort grows naturally in the Mississippi. This is an annual plant, having a thick fleshy stalk about two feet high, which divides into three or four spreading branches, garnished with oval heart-shaped leaves, of a soft green, very viscous and hairy; the flowers terminate the branches in a loose thyrse; they are in shape like those of the first sort, but of a paler colour, and are succeeded by large oval fruit, having very thick covers like the outer shell of Wal-

nuts, with two long incurved horns at the end: the outer shell drops off when the fruit is ripe, leaving a hard fibrous nut hanging on the plant, which opens in the middle, having four cells, each containing two or three oval seeds.

The first and third sorts are annual, so are only propagated by seed, which should be sown in pots, and plunged into a hot-bed of tanners bark, where, if the seeds are intirely separated from their covers, the plants will appear in about a month, and will grow pretty fast, if the bed is warm; they should therefore be transplanted in a little time after they come up, each into a separate pot, and plunged into the hot-bed again, observing to water and shade them from the sun, until they have taken new root; then they should have a large share of fresh air admitted to them in warm weather, to prevent their drawing. With this management the plants will make great progress, so as to fill the pots with their roots in about a month's time, when they should be shifted into pots, about a foot diameter at the top, and plunged into the hot-bed in the bark-stove, where they should be allowed room, because they put out many side branches, and will grow three feet high or more, according to the warmth of the bed, and the care which is taken to supply them constantly with water. When these plants thrive well, they will send out many side branches, which will all of them produce small spikes of flowers; but it is only from the first spike of flowers that good seeds can be expected in this country, so that particular care should be taken, that none of those are pulled off or destroyed, because it is very difficult to obtain good seeds here, especially of the first sort: but the third sort is much more hardy, so will perfect its seeds here very well, especially if the plants are not too much drawn.

The nuts of the first sort are so hard, as to render it very difficult to get out the seeds without breaking them; and if the whole nut is put into the ground, the seeds do seldom grow. I have had some of the nuts lying in the ground two years, which after were taken up, and appeared as found and good as when they were first put in, and some of the seeds have grown after being kept four or five years above ground.

The second sort dies to the root every winter, and rises again the succeeding spring. This must be constantly preserved in the stove, and plunged into the bark-bed, otherwise it will not thrive in this country. During the winter season, when the plants are decayed, they should have but little water given them; about the middle of March, just before the plants begin to shoot, is the proper season to transplant and part the roots, when they should be planted into pots of a middle size, and plunged into the bark-bed, which should at this time be renewed with fresh tan. When the plants come up, they must be treated in the same way as other tender exoticks, which require the bark-stove.

MARVEL OF PERU. See Mirabilis.

MARUM SYRIACUM. See Teucrium.

MARUM VULGARI. See Satureja.

MARYGOLD. See Calendula.

MARYGOLD (AFRICAN). See Tagetes.

MARYGOLD (FIG). See Mesembryanthemum.

MARYGOLD (FRENCH). See Tagetes.

MASTERWORT. See Imperatoria.

MASTICHINA. See Satureja.

MATRICARIA. *Tourn. Inst. R. H. 493. tab. 281.* Fe-verfew.

The Characters are,

It hath a compound flower. The ray or border is composed of female half florets, and the disk, which is hemispherical, of hermaphrodite florets. The female half florets are tongue-shaped, and indented in three parts at the end; these have a naked germen. The hermaphrodite florets are tubulous, funnel-shaped, and cut

cut into five parts at the brim; they have each five hairy short stamina, and an oblong naked germen. The germen of both turn to single, oblong, naked seeds.

The Species are,

1. *MATRICARIA foliis compositis planis, foliolis ovatis incisif, pedunculis ramosis. Hort. Cliff. 416.* Common, or Garden Feverfew.

2. *MATRICARIA receptaculis hemisphaericis, foliis bipinnatis subcarnosis, supra convexis, subtus carinatis. Lin. Sp. Plant. 891.* Feverfew; commonly called dwarf, perennial, maritime Chamomile, with short, thick, dark, green leaves.

The first sort is the common Feverfew, which is directed to be used in medicine. It grows naturally in lanes, and upon the side of banks, in many parts of England, but is frequently cultivated in the physick gardens to supply the markets. The stalks rise upward of two feet high; they are round, stiff, and striated; the leaves are composed of seven lobes, which are cut into many obtuse segments; the stalks and branches are terminated by the flowers, which are disposed almost in the form of loose umbels. The flowers are composed of several short rays, which are white like those of the Chamomile, surrounding a yellow disk composed of hermaphrodite florets, which form a hemisphere, and are inclosed in one common scaly empalement, which are succeeded by oblong, angular, naked seeds. The whole plant has a strong unpleasant odour.

The following varieties of this plant, are preserved in botanick gardens, many of which are pretty constant, if care is taken of saving the seeds; but where the seeds of these plants have been suffered to scatter, it will be almost impossible to preserve the varieties without mixture. I shall only just insert them here, for those who are curious in collecting the varieties.

1. Feverfew with very double flowers.
2. Feverfew with double flowers, whose borders or rays are plain, and the disk fistular.
3. Feverfew with very small rays.
4. Feverfew with very short fistular florets.
5. Feverfew with naked heads, having no rays or border.
6. Feverfew with naked sulphur-coloured heads.
7. Feverfew with elegant curled leaves.

These plants are propagated by their seeds, which should be sown either in spring or autumn; and when the plants are come up, they should be transplanted out into nursery-beds, at about six inches asunder, where they may remain till they have grown large, when they may be taken up, with a ball of earth to their roots, and planted in the middle of large borders, where they will flower, and produce ripe seeds.

When the different varieties of these plants are intermixed with other plants of the same growth in large gardens, they are ornamental. But as their roots seldom abide more than two years, fresh plants should be raised from seeds, to supply their places; for although they may be propagated by parting their roots either in spring or autumn, yet these seldom make so good plants as those obtained from seeds. When these plants grow from the joints of walls, or upon dry lime rubbish, they will continue much longer than in good ground.

The second sort grows naturally near the sea, in several parts of England. I have observed it upon the *Suffex* coast in great plenty, from whence I brought the plants, which were of no longer duration in the garden than two years, though in their native soil they may continue longer. The stalks of this plant branch out pretty much, and spread near the ground; they are garnished with dark green leaves, which are composed of many double wings, or pinnæ, like those of the common Chamomile, but are much thicker in substance; they have their edges turned backward, so are

convex on their upper surface, and concave on their under. The flowers are white, like those of the common Chamomile, and are disposed almost in the form of an umbel.

This plant is seldom cultivated but in botanick gardens for variety. It may be propagated by seeds, which may be sown either in autumn, soon after they are ripe, or in the spring, upon a bed of common earth, in almost any situation; and when the plants come up, they will require no other care, but to thin them where they are too close, and keep them clean from weeds.

MAUDLIN. See Achillea.

MAUROCENIA. *Lin. Gen. Plant. edit. 2. 289.* The Hottentot Cherry.

The Characters are,

The flower hath five oval petals, which spread open. It hath five stamina, which are situated between the petals. In the center is situated a roundish germen, crowned by a trifid stigma. The germen afterward turns to an oval berry, with one or two cells, each containing a single oval seed.

The Species are,

1. *MAUROCENIA foliis subovatis integerrimis, floribus confertis lateralibus.* Maurocencia with entire leaves, which are almost oval, and flowers growing in clusters on the sides of the branches; commonly called *Hottentot Cherry*.

2. *MAUROCENIA foliis obversè ovatis serratis, floribus corymbosis alaribus & terminalibus.* Maurocencia with obverse, oval, sawed leaves, and flowers growing in a corymbus at the sides and ends of the branches; commonly called *Cape Phillyrea*, and by the *Dutch* *Leplehout*.

3. *MAUROCENIA foliis ovatis nervosis integerrimis.* Maurocencia with oval veined leaves, which are entire; commonly called smaller *Hottentot Cherry*.

4. *MAUROCENIA foliis obversè ovatis emarginatis, floribus solitariis alaribus.* Maurocencia with obverse oval leaves, which are indented at the edges, and flowers growing singly from the sides of the branches.

The first three sorts grow naturally at the *Cape of Good Hope*; the first rises to a considerable height in that country. The stalk is strong, woody, and covered with a purplish bark, sending out many stiff branches, garnished with very thick leaves, almost oval, standing for the most part opposite, of a dark green colour, and entire. The flowers come out from the side of the old branches in clusters, three, four, or five standing upon one common foot-stalk; they are composed of five plain equal petals, ending in acute points, of a greenish yellow colour, changing to white. In the center is situated the oval germen, crowned by a trifid stigma, and between each petal is situated a stamina, terminated by obtuse summits. The germen afterward turns to an oval pulpy berry, some having but one, and others two cells; in each of these is lodged one oval seed.

The second sort hath a woody stalk, which in this country seldom rises more than eight or ten feet high, dividing into many branches, covered with a dark purplish bark, garnished with pretty stiff leaves, which are sawed on their edges, obversely oval, and stand opposite, of a light green, having short foot-stalks. The flowers are produced in roundish bunches from the side, and at the end of the branches; they are white, and have five small petals, between which are situated the stamina, terminated by obtuse summits. In the center is situated a roundish germen, crowned sometimes by a bifid, and at others by a trifid stigma.

The third sort rises with a woody stalk about the same height as the former, dividing into many branches, garnished with stiff, oval, intire leaves, of a light green colour, having three longitudinal veins; these are sometimes placed opposite, and at others they are alternate, having a strong margin or border surrounding them.

The fourth sort was discovered by the late Dr. *Houffoun*, growing naturally at the palisadoes in *Jamaica*. This rises with a woody stalk, from fifteen to twenty feet high, covered with a rough brown bark, which divides into many branches, garnished with stiff leaves, placed alternately, indented at the top, with a stiff reflexed border, of a gray colour on their upper side, but of a rusty iron colour on their under, standing upon short foot-stalks. The flowers come out singly along the side of the branches, which have five small white petals, ending in acute points, and five slender stamina, which are terminated by obtuse summits. In the center is situated a roundish germen, supporting a long bifid stigma, which is permanent. The germen afterward turns to a round berry, with one or two cells, each having one oblong seed.

The first sort is too tender to live abroad in *England*, but as it requires no artificial heat, so may be preserved through the winter in a good green-house, where it deserves a place for the beauty of its leaves, which are very thick, of a deep green, and differing in appearance from every other plant. It may be propagated by laying down those shoots which are produced near the ground, but they are long in putting out roots. The shoots should be twisted in the part which is laid, to facilitate their putting out roots: if these are laid down carefully in autumn, they will put out roots sufficient to remove by the following autumn; it may also be propagated by cuttings, but this is also a tedious method, as they are seldom rooted enough to transplant in less than two years. When this is practised, the young shoots of the former year should be cut off, with a small piece of the old wood at the bottom, and planted in pots filled with loamy earth, which must be plunged into a moderate hot-bed, covering the pots with hand-glasses, which should be close stopped down to exclude the external air; they should be pretty well watered at the time they are planted, but afterward they will require but little wet; the glasses over them should be covered with mats, to screen the cuttings from the sun during the heat of the day, but in the morning before the sun is too warm, and in the afternoon, when the sun is low, they should be uncovered, that the oblique rays of the sun may raise a gentle warmth under the glasses. With this care the cuttings will take root, but where this is wanting, they seldom succeed. When the cuttings or layers are rooted, they should be each planted in a separate small pot, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain during the summer season; and, before the frosts of the autumn, they must be removed into the green-house, and treated in the same way as the other plants of that country. When the plants have obtained strength, they will produce flowers and fruit, which in warm seasons will ripen perfectly; and if the seeds are sown, soon after they are ripe, in pots, and plunged into the tan-bed in the stove, the plants will come up the spring following, and may then be treated in the same manner as those which are propagated by cuttings and layers.

The second sort is not altogether so hardy as the first, so must have a warmer place in the green-house in winter, and should not be placed abroad quite so early in the spring, nor suffered to remain abroad so late in the autumn; but if the green-house is warm, the plants will require no additional heat. This may be propagated by layers and cuttings, in the same manner as the first, and requires the same care, for the cuttings are with difficulty made to root; nor will the branches which are laid put out roots in less than a year, and if these are not young shoots, they will not take root.

The third sort is yet more rare than either of the former, and is with greater difficulty propagated, for the layers and

cuttings are commonly two years before they get roots sufficient to remove; and as it never produces seeds here, so can be no other way propagated. This is also tenderer than either of the other sorts, so requires a moderate degree of heat in winter, for without some artificial warmth it will not live through the winters in *England*. In the middle of summer the plants may be placed abroad in a warm situation, but they must be removed into shelter early in the autumn, before the cold nights come on, otherwise they will receive a check, which they will not recover in winter.

The fourth sort is much more impatient of cold than either of the other, being a native of a warmer country. This is propagated in the same way as the other sorts, but when seeds can be obtained from *Jamaica*, the plants produced from those will be much the best; but as the seeds seldom come up the first year, so they should be sown in pots, and plunged into a moderate hot-bed of tanners bark, where they may remain all the summer; and in the autumn they should be removed into the bark-stove, and plunged into the tan-bed between the other pots of plants, in any vacant spaces; there they may remain till spring, when they should be taken out of the stove, and plunged into a fresh hot-bed, which will bring up the plants. When these are fit to remove, they should be each transplanted into a separate small pot, and plunged into a hot bed again, being careful to shade them from the sun, till they have taken new root; after which, they must be treated in the same manner as other tender plants from the same country.

All the sorts delight in a soft, gentle, loamy soil, not over stiff, so as to detain the wet; nor should the soil be too light, for in such they will not thrive. They retain their leaves all the year, so make a good appearance in the winter season, their leaves being remarkably stiff and of a fine green, especially the first sort, whose fruit ripen in winter, which when it is in plenty on the plants, affords an agreeable variety.

MAYS. See *Zea*.

MEADIA. *Catesb. Carol.* 3. p. 1.

The Characters are,

The flower hath a permanent empalement of one leaf, cut into five long segments, which are reflexed. The flower hath one petal, cut into five parts, whose limb is reflexed backward. It hath five short stamina sitting in the tube, connected at the top with a conical germen, terminated by an obtuse stigma. The empalement afterward becomes an oblong oval capsule with one cell, opening at the top, and filled with small seeds.

This genus of plants was so titled by Mr. *Mark Catesby*, F. R. S. in honour of the late Dr. *Mead*, who was a generous encourager of every useful branch of science.

We have but one Species of this genus, viz.

MEADIA. *Catesb. Hist. Carol. App.* 1. tab. 1. *Meadia*.

This plant grows naturally in *Virginia*, and other parts of *North America*, from whence many years ago it was sent by Mr. *Banister* to Dr. *Compton*, Lord Bishop of *London*, in whose curious garden I first saw this plant growing in the year 1709; after which it was for several years lost in *England*, till within a few years past, when it was again obtained from *America*, and has been since propagated in pretty great plenty. It hath a perennial root, from which comes out several long smooth leaves, which are six inches long, and two and a half broad; at first standing erect, but afterward they spread on the ground, (especially if the plants are much exposed to the sun). From between these leaves arise two, three, or four stalks, in proportion to the strength of the roots, eight or nine inches high; they are smooth, naked, and are terminated by an umbel of flowers, under which is situated the many-leaved involucre. Each flower is sustained by a pretty long slender foot stalk, which is recurved, so that the flower hangs downward. It has but one

one petal, which is deeply cut into five spear-shaped segments, which are reflexed backward like the flowers of Cyclamen or Sowbread; the stamina, which are five in number, are short, and sit in the tube of the flower, having five arrow-pointed summits, which are connected together round the style, forming a sort of beak. The flowers are purple, inclining to a Peach blossom colour, and have an oblong germen situated in the bottom of the tube, which afterward becomes an oval capsule inclosed by the empalement, with the permanent style on its apex, which, when ripe, opens at the top to let out the seeds, which are fastened round the style. This plant flowers the beginning of *May*, and the seeds ripen in *July*, soon after which the stalks and leaves decay, so that the roots remain inactive till the following spring.

It is propagated by offsets, which the roots put out freely when they are in a loose moist soil and a shady situation; the best time to remove the roots, and take away the offsets, is in *August*, after the leaves and stalks are decayed, that they may be fixed well in their new situation, before the frost comes on. It may also be propagated by seeds, which the plants generally produce in plenty; these should be sown in the autumn soon after they are ripe, either in a shady moist border, or in pots which should be placed in the shade; in the spring the plants will come up, and must then be kept clean from weeds, and if the season proves dry, they must be frequently refreshed with water; nor should they be exposed to the sun, for while the plants are young, they are very impatient of heat, so that I have known great numbers of them destroyed in two or three days, which were growing to the full sun. These young plants should not be transplanted till the leaves are decayed, then they may be carefully taken up and planted in a shady border, where the soil is loose and moist, at about eight inches distance from each other, which will be room enough for them to grow one year, by which time they will be strong enough to produce flowers, so may then be transplanted into some shady borders in the flower-garden, where they will appear very ornamental during the continuance of their flowers.

MEADOW SAFFRON. See Colchicum.

MEDEOLA. *Lin. Gen. Plant.* 411.

The Characters are,

The flower has no empalement; it hath six oblong oval petals, and six awl-shaped stamina, terminated by incumbent summits, and three horned germen terminating the style. The germen afterward turns to a roundish trifid berry with three cells, each containing one heart shaped seed.

The Species are;

1. MEDEOLA *foliis ovato-lanceolatis alternis, caule scandente.* Medeola with oval, spear-shaped, alternate leaves, and a climbing stalk; commonly called Climbing African Asparagus, with a Myrtle leaf.

2. MEDEOLA *foliis lanceolatis alternis, caule scandente.* Medeola with spear-shaped alternate leaves, and a climbing stalk; or narrow-leaved, climbing, African Asparagus.

3. MEDEOLA *foliis verticillatis, ramis aculeatis.* *Lin. Sp. Plant.* 339. Medeola with leaves growing in whorls and prickly branches.

4. MEDEOLA *foliis verticillatis, ramis inermibus.* *Lin. Sp. Plant.* 339. Medeola with leaves growing in whorls and smooth branches.

The first and second sorts grow naturally at the Cape of Good Hope. They have tuberose roots, composed of several dug or oblong knobs, which unite together at the top, from which arise two or three stiff stalks, which rise four or five feet high, if they meet with any neighbouring support, to which they can fasten, otherwise they fall to the ground: the first is garnished with oval spear-shaped leaves,

ending in acute points, placed alternately, sitting close to the stalks, of a light green on their under side, and dark on their upper; the leaves of the second are much longer and narrower, in which their difference consists. The flowers come out from the side of the stalks, sometimes singly, at others there are two upon a slender short foot-stalk; they have six oblong equal petals, of a dull white colour; within these sit six stamina, which are as long as the petals, terminated by incumbent summits. In the center is situated a germen with three horns, sitting upon a short style, and crowned by three thick recurved stigmas; the germen afterward turns to a roundish berry with three cells, each containing one heart-shaped seed.

Both these sorts propagate freely by offsets from the roots, so that when they are once obtained, there will be no necessity of sowing their seeds, which commonly lie a year in the ground; nor will the plants be strong enough to flower in less than two years more, whereas the offsets will flower the following spring. The time for transplanting and parting of the roots is in *July*, when their stalks are entirely decayed, for they begin to shoot toward the end of *August*, and keep growing all the winter. These roots should be planted in pots, and may remain in the open air till there is danger of frost, when they must be removed into shelter, for they are too tender to live through the winter in the open air; but if they are placed in a warm greenhouse, they will thrive and flower very well, but they seldom produce fruit unless they have some heat in winter; therefore where that is desired, the plants should be placed in a stove kept to a moderate degree of warmth.

The third sort grows naturally in the *West-Indies*. The late Dr. *Houssoun* found it near the *Havannah*, and Mr. *Robert Millar* gathered it in the isle of *Tobago*, where it was growing in plenty. This is a very low shrub, seldom rising more than three feet high in its native soil; the stalks are herbaceous like those of Butchers Broom, and divide upward into several branches, garnished with stiff leaves, ending in acute spines; they are like those of the Butchers Broom, but are longer and narrower; these stand in whorls round the stalks; there are nine, eleven, or more, at each joint. The flowers are produced just under the leaves, sometimes singly, at others there are two, which come out from the same joint; they are of an herbaceous white colour, having six oblong pointed petals, with six stamina not so long as the petals, and a roundish germen, which afterward turns to an oval berry with three cells, each having one heart-shaped seed.

This plant is tender, so will not thrive in this country, unless it is placed in a bark-stove. It is propagated by seeds, which should be sown in pots, and plunged into a bark bed, where they may remain all the summer, for the plants seldom come up the first year; in autumn they should be removed into the bark stove, where they may remain till the following spring, when they should be removed into a fresh hot-bed, which will bring up the plants; but as these are very slow in their growth, so they will not be fit to transplant till the following spring, when they may be each planted in a separate pot filled with light sandy earth, and plunged into a fresh hot-bed, shading them from the sun till they are new rooted; after which, they must be treated in the same way as other tender plants from the same country.

The fourth sort is a native of *North America*. It is by Dr. *Linnaeus* joined to this genus, in which I have followed him; though, if I remember rightly, the characters do not exactly agree with the other, for the flower is either polypetalous, or is cut into many segments, and has but five stamina; being some years since I saw the flowers, I cannot be very certain if I am right. This hath a small scaly root, from which

which arises a single stalk about eight inches high, garnished with one whorl of leaves at a small distance from the ground, and at the top there are two leaves standing opposite; between these come out three slender foot-stalks, which turn downward, each sustaining one small, pale, herbaceous flower, with a purple pointal.

This plant is hardy enough to live in the open air, but does not propagate fast here, as it produces no seeds, so can only be increased by offsets.

MEDICA. *Tourn. Inst. R. H.* 410. *tab.* 231. Medick, or *La Lucerne*.

The Characters are,

The flower is of the butterfly kind; the standard is oval, and entire; the two wings are oblong, oval, and fixed by an appendix to the keel; the keel is oblong, bifid, and reflexed toward the standard. It has ten stamina, nine of which are joined almost to their tops; the other is single, terminated by small summits. It hath an oblong compressed germen, which is recurved, sitting on a short style; this and the stamina are involved by the keel and standard. The germen afterward turns to a compressed moon-shaped pod, inclosing several kidney-shaped seeds.

The Species are,

1. MEDICA caule erecto herbaceo, foliis ternatis, foliolis lanceolatis supernè ferratis floribus spicatis alaribus. Greater upright Medick with purplish flowers; commonly called *La Lucerne*, and by the French, *Burgundy Hay*.

2. MEDICA caule herbaceo diffuso, foliis ternatis, foliolis lineari-lanceolatis, spicis brevioribus alaribus & terminalibus. Wild Medick with Saffron-coloured flowers.

3. MEDICA caule herbaceo procumbente, foliis ternatis, leguminibus ciliato-dentatis. Medick with an herbaceous trailing stalk, trifoliate leaves, and pods which have hairy indentures.

4. MEDICA caule herbaceo procumbente, foliis pinnatis, leguminibus ciliato-dentatis. Medick with a trailing herbaceous stalk, winged leaves, and pods having hairy indentures.

5. MEDICA caule herbaceo prostrato, foliis ternatis, foliolis cuneiformibus supernè ferratis, leguminibus margine integerrimis. Medick with a prostrate herbaceous stalk, trifoliate leaves, whose lobes are wedge-shaped, sawed at the top, and the borders of the pods entire.

6. MEDICA caule herbaceo prostrato, pedunculis racemosis, leguminibus lunatis. Medick with a prostrate herbaceous stalk, branching foot-stalks, and moon-shaped pods.

7. MEDICA caule herbaceo prostrato, foliis radicalibus integerrimis, caulibus pinnatis, leguminibus dentatis. Medick with a prostrate herbaceous stalk, the bottom leaves entire, those on the stalks winged, and indented pods.

8. MEDICA foliis ternatis, foliolis cuneiformibus, caule erecto arboreo. Medick with trifoliate leaves, whose lobes are wedge-shaped, and an erect tree-like stalk; or *Cytisus Virgilii*.

The first sort hath a perennial root and an annual stalk, which rises four feet high in good land, garnished with trifoliate leaves at each joint, whose lobes are spear-shaped, sawed toward their top. The flowers grow in spikes, which are from two to near three inches in length, standing upon naked foot-stalks, rising from the wings of the stalk; they are of the Pea bloom or butterfly kind, of a fine purple colour; these are succeeded by compressed moon-shaped pods, which contain several kidney-shaped seeds.

There are the following varieties of this plant:

One with Violet-coloured flowers.

Another with yellow flowers.

A third with yellow and Violet flowers mixed.

And a fourth with variegated flowers; but the first is the best for use.

This plant is supposed to have been brought originally from *Media*, and from thence had its name *Medica*; it is

by the Spaniards called *Alfafa*; by the French, *La Lucerne*, and *Grande Trèfle*; and by several botanick writers it is called *Fœnum Burgundiacum*, i. e. *Burgundian Hay*. But there is little room to doubt of this being the *Medica* of *Virgil*, *Columella*, *Palladius*, and other ancient writers of husbandry, who have not been wanting to extol the goodness of this fodder, and have given direction for the cultivation of it in those countries where they lived.

But notwithstanding it was so much commended by the ancients, and hath been cultivated to so good purpose by our neighbours in *France* and *Switzerland* for many years, it hath not as yet found so good reception in our country as could be wished, nor is it cultivated in any considerable quantity here; though it is evident, it will succeed as well in *England* as in either of the before-mentioned countries, being extremely hardy, and resisting the severest cold of our climate: as a proof of this, I must beg leave to mention, that the seeds which have happened to be scattered upon the ground in autumn, have come up, and the plants have endured the cold of a severe winter, and made very strong plants.

About the year 1650, the seeds of this plant were brought over from *France*, and sown in *England*; but whether for want of skill in its culture, whereby it did not succeed, or that the people were so fond of going on in their old beaten road, as not to try the experiment, was the occasion of its being entirely neglected in *England*, I cannot say, but it is very certain that it was neglected many years, so as to be almost forgotten. However, I hope, before I quit this article, to give such directions for its culture, as will encourage the people of *England* to make farther trial of this valuable plant, which grows in the greatest heat, and also in very cold countries, with this difference only, that in very hot countries, such as the *Spanish West-Indies*, &c. where it is the chief fodder for their cattle at this time, they cut it every week, whereas in cold countries it is seldom cut oftener than three or four times a year. It is very certain, that this plant will be of great service to the inhabitants of *Barbadoes*, *Jamaica*, and the other hot islands in the *West-Indies*, where one of the greatest things they want is fodder for their cattle; since by the account given of this plant by *Pere Feuillé*, it thrives exceedingly in the *Spanish West-Indies*, particularly about *Lima*, where they cut it every week, and bring it into the market to sell, and is there the only fodder cultivated.

The directions given by all those who have written of this plant, are very imperfect, and generally such as, if practised in this country, will be found entirely wrong; for most of them order the mixing of this seed with Oats or Barley (as is practised for Clover;) but in this way it seldom comes up well, and if it does, the plants will draw up so weak by growing amongst the Corn, as not to be recovered under a whole year, if ever it can be brought to its usual strength again.

Others have directed it to be sown upon a low, rich, moist soil, which is found to be the worst next to a clay, of any for this plant; in both which the roots will rot in winter, and in a year or two the whole crop will be destroyed.

But the soil in which this plant is found to succeed best in this country is, a light, dry, loose, sandy, deep land, which should be well ploughed and dressed, and the roots of all noxious weeds, such as Couch Grass, &c. destroyed, otherwise these will overgrow the plants while young, and prevent their progress.

The best time to sow the seed is about the middle of *April*, when the weather is settled and fair; for if you sow it when the ground is very wet, or in a rainy season, the seeds will burst and come to nothing (as is often the case with several of the leguminous plants;) therefore you should

always observe to sow it in a dry season; and if there happens some rain in about a week or ten days after it is sown, the plants will soon appear above ground.

But the method I should direct for the sowing these seeds, is as follows: After having well ploughed and harrowed the land very fine, you should make a drill quite across the ground almost half an inch deep, into which the seeds should be scattered very thin, covering them a quarter of an inch thick, or somewhat more, with the earth; then proceed to make another drill about a foot and a half from the former, sowing the seeds therein in the same manner as before, and so proceed through the whole spot of ground, allowing the same distance between row and row, and scatter the seeds very thin in the drills. In this manner, an acre of land will require about six pounds of seeds; for when it is sown thicker, if the seed grows well, the plants will be so close as to spoil each other in a year or two, the heads of them growing to a considerable size, as will also the roots provided they have room. I have measured the crown of one root, which was in my possession, eighteen inches diameter; from which I cut near four hundred shoots at one time, which is an extraordinary increase, and this upon a poor, dry, gravelly soil, which had not been dunged for many years, but the root was at least ten years old; so that if this crop be well cultivated, it will continue many years, and annually improve; for the roots generally run down very deep in the ground, provided the soil be dry; and although they should meet a hard gravel a foot below the surface, yet their roots would penetrate it, and make their way downward, as I have experienced, having taken up some of them, which were above a yard in length, and had run above two feet into a rock of gravel, which was so hard as not to be loosened without mattocks and crows of iron, and that with much difficulty.

The reason for directing this seed to be sown in rows is, that the plants may have room to grow; and for the better stirring the ground between them, to destroy the weeds, and encourage the growth of the plants, which may be very easily effected with a *Dutch* hoe, just after cutting the crop each time, which will cause the plants to shoot again in a very little time, and be much stronger than in such places where the ground cannot be stirred; when the plants first come up, the ground between should be hoed with a common hoe; and if in doing of this you cut up the plants where they are too thick, it will cause the remaining to be much stronger. This hoeing should be repeated two or three times while the plants are young, according as the weeds are produced, observing always to do it in dry weather, that the weeds may the better be destroyed; for if it be done in moist weather, they will root and grow again.

With this management the plants will grow to the height of two feet or more, by the beginning of *August*, when the flowers will begin to appear, at which time it should be cut, observing to do it in a dry season; if it is to be made Hay, it must be often turned, that it may soon dry, and be carried off the ground, for if it lie long upon the roots, it will prevent the shooting again. After the crop is taken off, you should stir the ground between the rows with a hoe, to kill the weeds, and loosen the surface, which will cause the plants to shoot again in a short time, so that by the middle or end of *September* there will be shoots four or five inches high, when you may turn in sheep upon it to feed it down, for it will not be fit to cut again the same season, nor should the shoots be suffered to remain upon the plants, which would decay when the frosty weather comes on, and fall upon the crown of the roots, and prevent their shooting early the succeeding spring. So that the best way is to feed it until *November*, when it will have done shooting for that season; but it should not

be fed by large cattle the first year, because the roots being young, would be in danger of being destroyed, either by their trampling upon them, or their pulling them out of the ground; but sheep will be of service to the roots by dunging the ground, provided they do not eat it too close, so as to endanger the crown of the roots.

The beginning of *February*, the ground between the rows should be again stirred with the hoe, to make it clean; but in doing of this you should be careful not to injure the crown of the roots, upon which the shoots will be coming out, for it is one of the earliest pabulum for cattle yet known. With this management, if the soil be warm, by the middle of *March* the shoots will be five or six inches high, when, if you are in want of fodder, you may feed it down till a week in *April*; after which it should be suffered to grow for a crop, which will be fit to cut the beginning of *June*, when you should observe to get it off the ground as soon as possible, and stir the ground again with a *Dutch* hoe, which will forward the plants shooting again; so that by the middle or latter end of *July*, there will be another crop fit to cut, which must be managed as before; after which it should be fed down again in autumn, and as the roots by this time will have taken deep hold in the ground, there will be little danger of hurting them, if you should turn in large cattle; but you must always observe not to suffer them to remain after the roots have done shooting, lest they should eat down the crown of the roots below the buds, which would considerably damage, if not destroy them.

In this manner you may continue constantly to have two crops to cut, and two feedings upon this plant; and in good seasons there may be three crops cut, and two feedings, which will be a great advantage to graziers, especially as this plant will grow upon dry barren soils, where Grass will come to little; and this will afford a good feed in dry summers, when Grass is often burnt up; for as it is an early plant in the spring, so it will be of great service when fodder falls short at that season, for it will be fit to feed at least a month before Grass or Clover.

The best places to procure the seed from, are *Switzerland*, and the northern parts of *France*, which succeed better with us than that which comes from a more southern climate; but this seed may be saved in *England* in great plenty, if a small quantity of ground stocked with the plants should be left uncut till the seeds are ripe, when it must be cut, and laid to dry in an open barn where the air may freely pass through, but defended from the wet, for if it be exposed thereto, it will shoot while it remains in the pod, whereby it will be spoiled. When it is quite dry, it must be threshed out, and cleansed from the husk, and preserved in a dry place till the season for sowing it. The seed saved in *England* is much preferable to any brought from abroad, as I have several times experienced, the plants produced from it having been much stronger than those produced from *French*, *Switzerland*, and *Turkey* seeds, which were sown at the same time, and on the same soil and situation.

I am inclinable to think that the reason of this plant not succeeding, when it has been sown in *England*, has either been occasioned by the sowing it with Corn, with which it will by no means thrive; or by sowing it at a wrong season, or in wet weather, whereby the seeds have rotted, and never come up, which hath discouraged their attempting it again; but however the success has been, I dare aver, that if the method of sowing and managing of this plant, which is here laid down, be duly followed, it will be found to thrive as well as any other sort of fodder now cultivated in *England*, and will continue much longer; for if the ground be duly stirred after the cutting each crop, and the last crop fed, as hath been directed, the plants will continue in vigour forty or fifty years, or more, without renewing, as there

there are many large fields now in *France* much older, which are very vigorous. I have had some plants in my possession more than forty years old, in great perfection.

The hay of this plant should be kept in close barns, it being too tender to be kept in reeks open to the air as other hay; but it will remain good, if well dried before it be carried in, three years. The people abroad reckon an acre of this fodder sufficient to keep three horses all the year round.

And I have been assured by persons of undoubted credit, who have cultivated this plant in *England*, that three acres of it have fed ten cart horses from the end of *April* to the beginning of *October*, without any other food, though they have been constantly worked. Indeed the best use which can be made of this Grass is, to cut it, and give it green to the cattle; where this hath been daily practised, I have observed that by the time the field has been cut over, that part which was the first cut, hath been ready to cut again; so that there has been a constant supply in the same field, from the middle of *April* to the end of *October*; when the season has continued long mild, and when the summers have proved showery, I have known six crops cut in one season, but in the driest seasons there will be always three or four. When the plant begins to flower it should then be cut, for if it stands longer, the stalks will grow hard, and the under leaves will decay, so that the cattle will not so greedily devour it. Where there is a quantity of this cultivated, some of it should be cut before the flowers appear, otherwise there will be too much to cut within a proper time.

When this is made into Hay, it will require a great deal of making; for as the stalks are very succulent, it must be often turned, and exposed a fortnight or more before it will be fit to house, for this requires a longer time to make than Saint Foin, therefore, when it is cut, it should be carried to make upon some Grass ground, because the earth in the intervals of the rows will wash up, and mix with the Hay in every shower of rain, and by carrying it off as soon as it is cut, the plants will shoot up again soon; but it is not so profitable for Hay, as to cut green for all sorts of cattle, especially horses, which are extremely fond of it, and to them it will answer the purpose of both Hay and Corn, and they may be worked at the same time just as much as when they are fed with Corn, or dry food. If milch cows are fed with this plant cut green all the summer, they will give a greater quantity of milk than with any other food; and the milk, as also the butter, will be better flavoured, as I have frequently experienced: therefore every dairy farm, where there is proper land, should always have a good field sown with Lucerne, which will be found very advantageous to the possessor: for I have known twelve cows kept from *May* day to *October*, with less than two acres of this plant; whereby the Hay on the other land, has been wholly reserved for winter.

The second sort grows naturally in the south of *France*, in *Spain* and in *Italy*, and has been supposed only a variety of the first, but I have frequently cultivated this by seeds, and have never observed it to alter. The stalks of this are smaller, do not stand erect, and never rise so high; the leaves are not half so broad; the flowers are produced in short roundish spikes, and are of a Saffron colour. It hath a perennial root which will continue many years, but is seldom cultivated any where.

The third sort grows naturally in *Italy*; this is an annual plant, with several slender branching stalks a foot and a half long, which spread on the ground, garnished with trifoliate leaves, whose lobes are oval, spear-shaped, and entire. The flowers are produced singly upon slender foot-stalks, which proceed from the side of the branches; they are small,

of a yellow colour, and shaped like those of the former sort; these are succeeded by broad, flat, moon-shaped pods, whose borders are indented, and terminated by fine hairs; in each of these pods, is lodged four or five kidney-shaped seeds.

The fourth sort grows naturally in *Spain*; this is also an annual plant, whose stalks grow a foot and a half long, trailing on the ground, garnished with winged leaves, composed of two pair of small lobes, terminated by one large, oval, spear-shaped one. The flowers stand upon long slender foot-stalks, each sustaining four or five gold-coloured flowers at the top, which are succeeded by compressed moon-shaped pods, not half so large as those of the third sort, but have hairy indentures like those.

The fifth sort grows naturally on the borders of the sea in several parts of *Italy*; this is also an annual plant, with prostrate herbaceous stalks, about a foot long, garnished with trifoliate leaves, whose lobes are wedge-shaped and sawed toward the top. The flowers are produced upon slender foot-stalks, each sustaining five or six pale yellow flowers, which are succeeded by small, thick, moon-shaped pods, whose borders are entire, containing three or four small kidney-shaped seeds in each.

The sixth sort grows in most of the warm countries in *Europe*; this is a biennial plant, with a prostrate herbaceous stalk about a foot long, garnished with trifoliate leaves, whose lobes are oval and entire. The flowers stand upon branching foot-stalks, which come out toward the end of the branches, each sustaining many pale yellow flowers upon short separate foot-stalks, which are succeeded by moon-shaped pods, each containing four or five kidney-shaped seeds.

The seventh sort grows naturally in the *Archipelago*; this is an annual plant; the stalks are slender, about a foot long, branching out into smaller, garnished with winged hoary leaves; those on the lower part of the stalk, are composed of two pair of lobes, terminated by an odd one, but those on the upper part of the stalks are trifoliate. The flowers are produced at the end of the stalks, they are small, yellow, and shaped like those of the other sorts, and are succeeded by compressed moon-shaped pods, which are acutely indented on their borders, and contain three or four kidney-shaped seeds.

These annual sorts are preserved in the gardens of those who are curious in botany; the seeds of these should be sown on an open bed of fresh ground, in the place where the plants are to remain, because they do not bear transplanting well, unless when they are young. As the plants spread their branches on the ground, so they should not be sown nearer than two feet and a half asunder; when the plants come up, they will require no other care, but to keep them clean from weeds.

The eighth sort grows naturally in the islands of the *Archipelago*, in *Sicily*, and the warmest parts of *Italy*. This rises with a shrubby stalk to the height of six or seven feet, covered with a grayish bark, and divides into many branches, which, while young, are covered with a hoary down, garnished at each joint with trifoliate leaves; the lobes are small, spear-shaped, and hoary on their under side; these remain all the year. The flowers are produced on foot-stalks, which arise from the side of the branches, which are of a bright yellow, each foot stalk sustaining four or five flowers, which are succeeded by compressed moon-shaped pods, each containing three or four kidney-shaped seeds.

It flowers great part of the year, especially when the winters are favourable, or when the plants are sheltered in winter, they are seldom destitute of flowers; but those in the open air begin to flower in *April*, and continue in succession till *December*. Those flowers which appear early in summer,

summer, will have their seeds ripe in *August*, or the beginning of *September*, and the others will ripen in succession till the cold stops them.

This plant may be propagated by sowing the seeds, either upon a moderate hot-bed, or on a border of light earth, in the beginning of *April*; when the plants come up, they should be carefully cleaned from weeds; but they should remain undisturbed, if sown in the common ground, till *August* following; but if on a hot-bed, they should be transplanted about *Midsummer* into pots, placing them in the shade until they have taken root; after which they may be removed into a situation where they may be screened from strong winds, in which they may abide till the latter end of *October*, when they must be put under a frame, to shelter them from hard frosts, especially while they are young. In *April* following these plants may be shaken out of the pots, and placed in the full ground, where they are designed to remain, which should be in a light soil and a warm situation, in which they will endure the cold of our ordinary winters extremely well, and continue to produce flowers most part of the year, and retaining their leaves all the winter renders them the more valuable.

Those also which were sown in an open border may be transplanted in *August* following, in the same manner; but in doing of this, you must be careful to take them up with a ball of earth to their roots, if possible, as also to water and shade them until they have taken root; after which they will require little more care than to keep them clear from weeds, to prune off the luxuriant branches to keep them within due compass; but you should never prune them early in the spring, nor late in autumn, for if frost should happen soon after they are pruned, it will hurt the tender branches, and, many times, the whole plant is lost thereby.

These plants have been supposed tender, so were housed every autumn; but I have had large plants of this kind, which have remained in the open air in warm situations many years without any cover, and have been much stronger, and flowered better, than those which were housed; though, indeed, it will be proper to keep a plant or two in shelter, lest by a very severe winter (which sometimes happens in *England*) the plants abroad should be destroyed.

They may also be propagated by cuttings, which should be planted in *April*, upon a bed of light earth, and watered and shaded until they have taken root, after which they may be exposed to the open air, but they should remain in the same bed till *August* following before they are transplanted, by which time they will have made strong roots, so should be removed to the places where they are to remain, observing (as was before directed) to water and shade them until they have taken root; after which you may train them up with straight stems, by fastening them to sticks, otherwise they are apt to grow crooked and irregular; and when you have got their stems to the height you design them, they may then be reduced to regular heads, and, with pruning their irregular shoots every year, they may be kept in very good order.

This plant grows in great plenty in the kingdom of *Naples*, where the goats feed upon it, with whose milk the inhabitants make great quantities of cheese; it also grows in the islands of the *Archipelago*, where the *Turks* use the wood of these shrubs to make handles for their sabres, and the *Calogers* of *Patmos* make their beds of this wood.

This is by many people supposed to be the *Cytisus* of *Virgil*, *Columella*, and the old writers on husbandry, which they mention as an extraordinary plant, and worthy of cultivation for fodder, from whence several persons have recommended it as worthy of our care in *England*. But however useful this plant may be in *Crete*, *Sicily*, *Naples*, or those

warmer countries, yet I am persuaded it will never thrive in *England*, so as to be of any real advantage for that purpose; for in severe frost it is very subject to be destroyed, or at least so much damaged, as not to recover its former verdure before the middle, or latter end of *May*, and the shoots which are produced, will not bear cutting above once in a summer, and then will not be of any considerable length, the stems growing very woody, which renders the cutting of it very troublesome; so that, upon the whole, it can never answer the trouble and expence in cultivating it, nor is it worth the trial, since we have so many other plants preferable to it; though in hot, dry, rocky countries, where few other plants will thrive, this may be of great advantage, as it grows from the fissures of rocks, where there is not soil for cultivation, in such situations this plant will live many years, and thrive very well.

But however unfit this may be for such uses in *England*, yet for the beauty of its hoary leaves, which will abide all the year, together with its long continuance in flower, it deserves a place in every good garden, where being intermixed with shrubs of the same growth, it makes a very agreeable variety.

MEDICAGO. *Lin. Gen. Plant.* 805. Snail Trefoil.

The Characters are,

The flower is of the butterfly kind, having an oval erect standard, whose borders are reflexed. The wings are oblong, oval, and fixed to the keel by an appendix. The keel is oblong, bifid, obtuse, and reflexed. It hath ten stamina, nine of which are joined, and the other is single, and an oblong germen, which sits upon a short style, and is involved with the stamina by the keel, crowned by a very small stigma; it afterward turns to a pod, twisted into the form of a snail, inclosing many kidney-shaped seeds.

The Species are,

1. MEDICAGO *pedunculis racemosis, leguminibus cochleatis, spinosis, caule procumbente tomentoso.* *Hort. Cliff.* 378. Medicago with branching foot-stalks, snail-shaped prickly pods, and a trailing woolly stalk; or Sea Medick.

2. MEDICAGO *leguminibus cochleatis inermibus, stipulis dentatis, caule anguloso diffuso, foliis oblongo ovatis acute dentatis.* Snail Trefoil; commonly called Snails.

3. MEDICAGO *leguminibus tornatis inermibus, stipulis acute dentatis, foliis ferratis.* Snail Trefoil, with a smaller, turned, smooth fruit.

4. MEDICAGO *leguminibus cochleatis spinosissimis aculeis utrinque tendentibus.* Snail Trefoil with a large fruit, whose spines point upward and downward; commonly called Hedgehog.

5. MEDICAGO *leguminibus cochleatis spinosis, foliis acute dentatis tricuspisisque.* Snail-shaped Trefoil, with a round prickly capsule, and elegantly cut leaves.

There are many other species of this genus, which grow naturally in the warm parts of *Europe*, and are preserved in botanick gardens for the sake of variety; but as these are rarely cultivated in other gardens, so it would be beside my purpose to enumerate them here.

The first sort grows naturally on the borders of the *Mediterranean* sea; this is a perennial plant, with trailing woolly branches about a foot long, divided into small branches, garnished with trifoliate downy leaves at each joint. The flowers are produced from the side and at the ends of the branches, in small clusters; they are of a bright yellow colour, and are succeeded by small, round, snail-shaped fruit, which are downy, armed with a few short spines.

This plant is perennial, and may be propagated by seeds, which should be sown upon a warm border of dry soil in the spring, where the plants are designed to remain; when the plants come up, two or three of them may be transplanted into small pots to be sheltered in winter, because in

small, of a purplish colour, and are succeeded by small black fruit.

The thirteenth sort is a low shrub, seldom rising more than three feet high, dividing toward the bottom into slender branches, garnished with spear-shaped leaves, ending in acute points, of a dark green on their upper side, but of a hoary white on their under, having three longitudinal veins, and are placed opposite, upon short foot-stalks. The flowers are produced in loose bunches at the end of the branches, which are white, and are succeeded by small purple fruit.

The fourteenth sort hath a shrubby stalk eight or nine feet high, divided into many smooth slender branches, garnished with oval spear-shaped leaves; they are entire on their edges, and smooth on both sides, standing opposite, and have three longitudinal veins. The flowers are produced in loose panicles at the end of the branches, which are succeeded by very small purple fruit.

The fifteenth sort rises with several shrubby stalks five or six feet high, dividing into crooked branches, garnished with oval rough leaves, having five longitudinal veins, of a dark green on their upper side, but pale on their under, indented on their edges. The flowers are produced in very loose bunches, which come out from the side of the stalks, of an herbaceous colour, and are succeeded by small purplish fruit, filled with very small seeds.

The sixteenth sort rises with a shrubby stalk seven or eight feet high, divided into many smooth branches, garnished with smooth spear-shaped leaves, of a dark green colour, with three longitudinal veins; the edges of these leaves are closely set with bristly stinging hairs. The flowers are produced in loose bunches at the end of the branches, of a purplish colour, and are succeeded by very small black fruit.

All the sorts are natives of the warm parts of *America*, where there are many more species than are here enumerated. Most of these here mentioned, were found by the late Dr. *Houssoun*, growing naturally in *Jamaica*, from whence he sent many of their seeds to *Europe*, some of which succeeded; but most, if not all the plants which were raised from them, were lost in the severe winter in 1740, since which time they have not been recovered in *Europe*.

There is great beauty in the diversity of the leaves of these plants, many of them being very large, and most of them are of different colours on the two surfaces, their under side being either white, gold colour, or russet, and their upper of different shades of green, so that they make a fine appearance in the hot-house all the year; indeed, their flowers have no great beauty to recommend them, but yet for the singular beauty of their leaves, these plants deserve a place in all curious collections, as much as most other sorts.

There are very few of these plants at present in any of the *European* gardens, which may have been occasioned by the difficulty of bringing over growing plants from the *West-Indies*; and the seeds being small when they are taken out of the pulp, soon become dry, so rarely succeed. The best way to obtain these plants is, to have the entire fruits put up in dry sand, as soon as they are ripe, and forwarded by the soonest conveyance to *England*; these should be immediately taken out when they arrive, and the seeds sown in pots of light earth, and plunged into a moderate hot-bed of tanners bark. When the plants come up and are fit to remove, they must be each planted into a small pot, and plunged into the tan-bed; and afterward should be treated in the manner directed for the *ANNONA*, to which I shall desire the reader to turn, to avoid repetition.

MELIA. *Lin. Gen. Plant.* 473. The Bead tree.

The Characters are,

The flower hath five spear-shaped petals which spread open, and

a cylindrical nectarium of one leaf, indented at the brim in ten parts. It has ten small stamina inserted in the top of the nectarium, with a conical germen, which afterward turns to a soft globular fruit, including a roundish nut, having five rough furrows, and five cells, each containing one oblong seed.

The Species are,

1. MELIA *foliis bipinnatis*. *Flor. Zeyl.* 162. The Bead tree, or false Sycamore.

2. MELIA *foliis pinnatis*. *Hort. Cliff.* 161. Melia with winged leaves, or ever-green Bead tree.

The first sort grows naturally in *Syria*, from whence it was brought to *Spain* and *Portugal*, where it is now become as common almost, as if it were a native of those countries. This in warm countries grows to a large tree, spreading out many branches, garnished with winged leaves composed of three smaller wings, whose lobes are notched and indented on their edges, of a deep green on their upper side, but pale on the under. The flowers come out from the side of the branches in long loose bunches, composed of five long, narrow, spear-shaped petals, of a whitish blue colour, which are succeeded by oblong fruit as large as a small Cherry, green at first, but when ripe changes to a pale yellow, inclosing a nut with five deep furrows, having four or five cells, in each of which is lodged one oblong seed. The pulp which surrounds the nut, is said to have a deadly quality if eaten, and if mixed with grease and given to dogs it will kill them. The nuts are bored through, and strung by the *Roman* catholicks to serve as beads.

There has been of late years some of these plants introduced to the islands in the *West-Indies*, where I am informed they continue flowering, and produce their fruit most part of the year. The fruit I have received from thence by the title of *Indian Lilac*, from which I have raised many of the plants, which flower much stronger than those raised from *Portugal* seeds.

This sort is propagated by seeds, which should be sown in pots, and plunged into a hot-bed of tanners bark, where (if the seeds are fresh) they will come up in about two months time: in *June* they should be gradually inured to bear the open air, and soon after placed abroad in a well sheltered situation, that they may be hardened before winter. In *October* you should remove the pots under a hot-bed frame, where they may enjoy free open air when the weather is mild, and be covered in hard frost.

In *April* following, you may shake out your plants from the seed-pots and divide them, planting each into a separate small pot, plunging them into a moderate hot-bed, which will greatly promote their rooting, and increase their growth; but you should not draw them too much, but give them a large share of air, when the weather is good; and the beginning of *June*, you should remove them out into the open air as before; during the three or four winters, while the plants are young, they require shelter from hard frost; but when the plants are grown pretty large and woody, they may be planted in the open air. The best season for this is in *April*, at which time you should shake them out of the pots, being careful not to shake the earth from the roots, but only pare off with a knife the outside of the ball. They should have a dry soil and a warm situation, otherwise they will be liable to miscarry in severe frosty weather.

Some of these plants which were planted in an open exposure, have endured the cold of our ordinary winters very well; but when a severe frost happens, they are generally killed, or at least their shoots are destroyed to the main stem; therefore it is much more secure to plant them against good aspected walls, where they will live and produce their flowers annually, and in warm seasons they may have fruit.

The second sort grows naturally in *India*, where it becomes a large tree; the stem is thick, the wood of a pale yellow, and the bark of a dark purple colour and very bitter. The branches extend wide on every side, which are garnished with winged leaves, composed of five or six pair of oblong acute-pointed lobes, terminated by an odd one, and have a strong disagreeable odour. The flowers are produced in long branching panicles, which proceed from the side of the branches; they are small, white, and cut into five acute segments; these are succeeded by oval fruit the size of small Olives, which, when ripe, are yellow; the pulp which surrounds the nut is oily, acrid, and bitter; the nut is white, and shaped like that of the former. It grows in sandy land, both in *India* and the island of *Ceylon*, where it is always green, and produces flowers and fruit twice a year.

This sort is now very rare in *England*, and also in the *Dutch* gardens, where some years past it was more common; it is propagated by seeds in the same way as the other sort, but being much tenderer, the plants should be kept constantly in the tan-bed.

The first sort is commonly called, *Zizyphus alba*, in *Portugal* and *Spain*, and in *Italy*, *Pseudocymorus*. It was by most of the modern botanists titled, *Azederach*, but Dr. *Linnaeus* has altered it to this of *Melia*, which was by *Theophrastus* applied to a species of *Ash*.

MELIANTHUS. *Tourn. Inst. R. H.* 430. tab. 245. Honey Flower.

The Characters are,

The flower hath four narrow spear shaped petals, divided into two lips, connected on their sides, and a nectarium of one leaf, situated in the lower segment of the empalement, and fastened with it to the receptacle. It hath four erect stamina, the two under being somewhat shorter than the other. In the center is situated a four-cornered germen, which afterward becomes a quadrangular capsule with distended cells, divided by partitions in the center, each containing one almost globular seed.

The Species are,

1. MELIANTHUS *stipulis solitariis petiolo adnati*. Hort. Cliff. 492. African Honey Flower, or greater Melianthus.
2. MELIANTHUS *stipulis geminis distinctis*. Hort. Cliff. 492. Smaller, stinking, African Honey Flower.

These plants grow naturally at the *Cape of Good Hope*, from whence the first sort was brought to *Holland* in the year 1672; this hath a perennial root, which spreads much in light ground, from which arise many hollow soft stalks, six or seven feet high, garnished with large winged leaves, which embrace the stalks with their base, where they have a large single stipulæ fastened on the upper side of the foot-stalk, with two ears at the base, which also embrace the stalk: The leaves have four or five pair of very large lobes, terminated by an odd one, which are deeply jagged on their edges into acute segments; between the lobes runs a double leafy border, or wing, on the upper side of the midrib, so as to connect the base of the lobes together. The flowers are produced in pretty long spikes, which arise from the top of the stalks; they are of a chocolate colour, formed like the lip flower, but have four narrow petals, in which it differs from the lip flowers; these are succeeded by oblong four-cornered capsules, divided by a central partition into four cells, each containing one roundish seed.

This plant was formerly preserved in green-houses, and treated as a tender exotick, but with that management the plants were so much drawn in winter, as to prevent their flowering. Bnt of late years they have been treated in a different way, most of them having been planted in the full ground in warm borders, where all those stalks which are not killed by frost, seldom fail to flower the spring following; so that the surest method to have them flower, is to cover

them with mats or reeds in frosty weather, to prevent their tops being killed by the cold; and if the plants grow in dry rubbish, they will not shoot so vigorous as in good ground, so will be less succulent, and therefore not so liable to suffer by frost.

This plant is easily propagated by taking off suckers or side shoots in spring, which, if they have good roots, there will be little danger of their growing, so should be planted where they are to remain, and will require no other care than is before-mentioned; they may be also be propagated by cuttings during any of the summer months, which, if watered and shaded, will take root very well, and may afterwards be transplanted where they are designed to remain.

The second sort rises with round, soft, ligneous stalks, five or six feet high, which send out two or three branches from their side, garnished with winged leaves like those of the former sort, but not half so large, and have two distinct stipulæ adhering to their foot-stalks; they are of a deep green on their upper side, and whitish on their under. The flowers come out from the side of the stalks in loose hanging bunches, each sustaining six or eight flowers, which are shaped like those of the first sort, but smaller; the lower part of the petals are green, their upper part are of a Saffron colour, and on the outside in the swelling part of the petals, is a blush of fine red; these have two long and two shorter stamina, which are terminated by yellow summits. The flowers are succeeded by four-cornered seed-vessels, which are shorter than those of the first sort, in which are lodged four oval seeds, in separate apartments.

This sort does not spread its roots so much as the first, so is not propagated with so great facility; but cuttings of this sort planted upon an old hot-bed, whose heat is over, and covered close with bell, or hand-glasses, to exclude the air, will take root pretty freely; these may be planted in pots, and sheltered in the winter under a common frame for a year or two, till they have obtained strength, then they may be planted in a warm border, and treated in the same way as the former sort, with which management I have seen them flower much better than any of those which have been treated more tenderly, and these plants have perfected their seeds in good seasons.

MELILOTUS. See *Trigonella*.

MELISSA. *Tourn. Inst. R. H.* 193. tab. 91. Baum.

The Characters are,

The flower is of the lip kind, having a cylindrical tube; the chaps are gaping, the upper lip is erect, forked, and indented at the end. The under lip is trifid. It hath four awl-shaped stamina, two of which are as long as the petal, the other are but half so long. It hath a quadrifid germen, which afterward turns to four naked seeds, sitting in the empalement.

The Species are,

1. MELISSA *racemis axillaribus verticillatis, pedicellis simplicibus*. Lin. Sp. Pl. 592. Garden, or common Baum.
2. MELISSA *floribus verticillatis sessilibus, foliis hirsutis*. Roman Baum, with soft hairy leaves and a strong smell.
3. MELISSA *pedunculis axillaribus dichotomis longitudine florum*. Lin. Sp. Plant. 592. Calamint with a large flower.
4. MELISSA *pedunculis axillaribus dichotomis longitudine foliorum*. Lin. Sp. Plant. 593. Common officinal Calamint of the Germans.
5. MELISSA *pedunculis axillaribus dichotomis folio longioribus, caule decumbente*. Lin. Sp. Plant. 593. Calamint with the scent of Pennyroyal.
6. MELISSA *racemis terminalibus, pedunculis solitariis brevissimis*. Lin. Sp. Plant. 593. Hoary Calamint with Basil leaves.
7. MELISSA *foliis ovatis glabris, floribus verticillatis sessilibus, pedunculis solitariis brevissimis*. Roman Calamint, with a Marjoram leaf, and the scent of Pennyroyal.

8. MELISSA

8. MELISSA fruticosa, ramis attenuatis virgatis, foliis sub-
tus tomentosis. Lin. Sp. Plant. 593. Shrubby Spanish Cala-
mint with a Marum leaf.

The first sort grows naturally on the mountains near *Geneva*, and in some parts of *Italy*, but is cultivated here in gardens, as a medicinal and culinary herb. It has a perennial root, the stalks are square, branching, and rises from two to three feet high, garnished with leaves set by pairs, indented about their edges, the lower ones standing upon pretty long foot-stalks. The flowers grow in loose bunches at the wings of the stalk, in whorls, standing upon single foot-stalks; they are of the lip kind, the upper lip stands erect, and is forked, the under lip is divided into three parts; the middle one is roundish, and indented at the top. The flowers are white, and the whole plant has a pleasant scent, somewhat like Lemons.

This plant is easily propagated by parting of the root; the best time for this is in *October*, that the offsets may have time to get root before the frosts come on. They should be planted two feet asunder in beds of common garden earth, in which they will soon spread and meet together; the only culture required is to keep the plants clean from weeds, and cut off the decayed stalks in autumn, stirring the ground between them.

The second sort grows naturally about *Rome*, and in several parts of *Italy*; this is very like the former. The stalks are slender, the leaves are much shorter than those of the former sort, and the whole plant is hairy, and of a strong disagreeable odour. It is seldom preserved, except in botanick gardens, but may be cultivated in the same way as the former.

The third sort grows naturally in the mountains of *Tuscany* and *Austria*, but is preserved in many *English* gardens for the sake of variety. It hath a perennial root, the stalks rise about a foot high, garnished at each joint with two leaves standing opposite, sawed on their edges, of a lucid green on their upper side, and whitish on their under: from the wings of the stalks come out single foot-stalks, which divide into two smaller, each of these sustain two flowers upon short separate foot-stalks. The flowers are large, of a purple colour, and shaped like those of the other species. This may be propagated and treated in the same way as the first sort.

The fourth sort is the common Calamint of the shops, which grows naturally in many parts of *England*, so is seldom kept in gardens.

The fifth sort is found in greater plenty than the fourth in *England*. The stalks of this are longer, and bend towards the ground. The leaves are larger, and more indented on their edges, and have a very strong scent like Pennyroyal. The whorls of flowers are set closer together than those of the fourth, but in other respects they agree.

The sixth sort grows naturally in the south of *France* and in *Italy*; this is not of so long duration as the former sorts, seldom continuing more than two or three years. The stalks are slender, a little ligneous, garnished with small, roundish, hoary leaves, placed opposite. The flowers are produced in whorls toward the upper part of the stalks, which are terminated by a loose spike; they are small and white, shaped like those of the other species, and are succeeded by seeds which ripen in autumn, and if they are permitted to scatter, there will be a sufficient supply of young plants.

The seventh sort grows naturally in *Italy*; this is a biennial plant, whose stalks are two feet long, declining toward the ground, garnished with roundish leaves, about the size of Marjoram. The flowers come out in close whorls on the upper part of the stalk, each standing on a short separate foot-stalk; they are large, and of a bright purple colour; this is propagated by seeds, which should be sown soon

after they are ripe, and then the plants will come up in the spring; but when the seeds are not sown till the spring, they seldom grow till the following year. The plants may also be propagated by cuttings, which, if planted in the summer, and shaded from the sun, will take root very freely. If these plants are planted on a warm border, they will live through the winter, but to preserve the species, a plant or two should be kept in pots, and sheltered under a frame in winter.

The eighth sort grows naturally in *Spain*; this hath slender shrubby stalks about nine inches long, which put out small side branches opposite, garnished with small, hoary, oval-pointed leaves, placed by pairs; these have much the appearance of the Marum Syriacum. The flowers grow in whorled spikes at the end of the stalks; they are small and white, and the seeds ripen in autumn. The whole plant has a strong scent of Pennyroyal; this is of as short duration as the seventh sort, and may be propagated either by seeds or cuttings in the same way, and the plants require the same treatment.

MELISSA TURCICA. See Dracocephalon.

MELO. Tourn. Inst. R. H. 104. tab. 32. Melon.

The Characters are,

It hath male and female flowers on the same plant. The male flowers have one petal, which is bell-shaped, fastened to the empalement, and cut into five segments at the brim. It hath three or four short stamina inserted in the empalement, joined together, two of which have bifid points. The female flowers have no stamina, or summits, but have a large oval germen situated below the flower, which afterward turns to an oval fruit with several cells, filled with oval, acute-pointed, compressed seeds, inclosed in a soft pulp.

There is a great variety of this fruit cultivated in the different parts of the world, and in this country there are too many of them propagated, which are of no value, especially by those who supply the markets, where their size is chiefly regarded; so that by endeavouring to augment their bulk, the fruit is rendered of no value: I shall therefore only mention a very few of the varieties, which are the most deserving of care, excluding the common Melons, as being unworthy the trouble and expence of cultivation.

The sort of Melon, which is in the greatest esteem among all the curious in every part of *Europe*, is the *Cantaleupe*, which is so called from a place about fourteen miles from *Rome*, where the pope has a country-seat, in which place this fruit has been long cultivated; but it was brought thither from that part of *Armenia*, which borders on *Persia*; where this fruit is in so great plenty, that a horse load is sold for a *French* crown. The flesh of this Melon, when in perfection, is delicious, and does not offend the most tender stomachs, so may be eaten with safety. The *Dutch* are so fond of this fruit, as to cultivate very few other sorts, and by way of pre-eminence, call it only by the appellation of *Cantaleupe*, and never join the title of Melon to it, which they apply indifferently to all the other sorts. The outer coat of this sort is very rough, full of knobs and protuberances like warts; it is of a middling size, rather round than long; the flesh is for the most part of an Orange colour, though there are some with a greenish flesh, but I have never met with any of that colour, so good as those of the other.

The *Romana* is by some much esteemed, and when the fruit is well conditioned, the plants in perfect health, and the season dry, it is a good Melon, and may be brought forwarder in the season than the *Cantaleupe*, therefore those who are desirous of early Melons, may cultivate this sort.

The *Succado* is also a good sort, and may be cultivated for early fruit, but these must give way to the *Cantaleupe*, when that is in season.

The Zatte is also a very good Melon, but very small. The fruit of this is seldom larger than an Orange; it is a little flattened at the two ends, and the outer coat is warted like the *Cantaleupe*, but there is so little flesh in one of these fruit, that they are scarce worthy the trouble of propagating.

The small *Portugal* Melon, which is by some called the Dormer Melon, is a pretty good fruit, and the plants generally produce them in plenty; so by many people this is preferred to most other, especially those who love a plenty, and are not so nice in distinguishing the quality. This may also be cultivated for an early crop.

But the best Melon for this purpose is the Black Galloway, which was brought from *Portugal* by Lord Galloway many years since, but of late years is rarely to be met with in *England*, it having been degenerated by growing among other sorts. The fruit of this sort will ripen in a shorter time from its first setting, than any other which I have yet seen; and when suffered to ripen naturally, is not a bad fruit.

The few varieties here mentioned, are sufficient to satisfy the curious, who may be fond of variety, for there are scarce any other which deserve the trouble; and indeed, those who have a true taste for this fruit, seldom cultivate any but the *Cantaleupe*; but as I before observed, where this fruit is desired early in the season, the *Cantaleupe* is not so proper as some of the other, therefore a few plants of one of the other sorts should be raised earlier in the spring, but it should be in a different part of the garden from the *Cantaleupe* Melons; for when two sorts of Melons grow near, they cannot be preserved perfectly right, therefore the *Dutch* and *German* gardeners are very careful in this respect; and in order to keep the sort in perfection, do not plant any other sort of Melon, Cucumber, or Gourd, near these, lest by the impregnation of the farina of those other, these fruit should be rendered bad; and in this particular I am convinced, from long experience, they are right; and from the not observing this, many persons who are lovers of this fruit, have gradually diminished their goodness, without knowing the cause, and have imputed it to the long cultivating from the seeds sowed in the same garden, believing it absolutely necessary to procure seeds from a distant place frequently, to preserve them good; indeed, where a person can securely depend on the care and skill of those he procures the seeds from, it is a very good method to exchange seeds now and then; but there are so few who are exact in making choice of the fruits from which they save the seeds, or careful enough to do it themselves, but often depend on others to clean the seed, that I should advise every one to do it himself, which is the sure way to have it good; for I have frequently been deceived myself, by depending on the fidelity and skill of others; nor could I procure any of these seeds from *Cantaleupe*, which were good, until my much honoured friend, the Chevalier *Rathgeb* sent me plentifully of it from thence; though I had often been supplied with seeds by persons who I thought could not be deceived in their choice, and who lived near the place of their growth.

Before I quit this head, I beg leave to caution all persons against depending upon seeds which are brought from abroad, either by those persons who import them for sale, or gentlemen who frequently bring or send over these seeds to their friends, for it seldom happens that any of these prove tolerable. I have been so often deceived by these myself, as to determine never to make trial of any of these seeds again, unless I receive them from a person who is skilful, and who eat of the fruit himself, of which he saved the seeds; for in *Italy*, *Spain*, *Portugal*, and many parts of *France*, the gardeners are very careless in the choice of all

their seeds, but of the Melons they are remarkably so; and as for those which come from *Constantinople*, *Aleppo*, and other parts of *Turkey*, I have rarely seen one Melon produced from those seeds, which was tolerable.

The seeds of Melons should not be sown until they are three years old, nor would I choose to sow them when they are more than six or seven; for although they will grow at ten or twelve years old, yet the fruit which are produced from those old seeds, are seldom so thick fleshed, as those which come from seeds which are fresher: it is the same of light seeds, which swim upon water, when they are taken out of the pulp, for I have made some trials of these, and have had them grow at three years old; but not one of the Melons produced on these plants was near so deep fleshed, as those which grew upon plants raised from heavy seeds, taken out of the same fruit, though they grew in the same bed, and were cultivated exactly in the same manner; nor was their flesh so firm, but rather inclining to be mealy; therefore I would not advise the sowing of these light seeds, nor those which are very old.

Having thus largely treated of the choice of the sorts, and of the seeds, I shall next proceed to the method of cultivating them, in order to obtain plenty of good fruit: the method which I am going to prescribe being very different from what has been constantly practised in *England*, will, I doubt not, be objected to by many; but it is what has been practised in all the good gardens in *Holland* and *Germany*, where the *Cantaleupe* Melon is produced in great plenty and perfection; and from several years experience, I have found this to be the only method in which these Melons can be cultivated with success; and I am likewise convinced, of its being the best way to obtain plenty of any other sort of Melon.

It is common to hear many persons valuing themselves upon having two or three early Melons, which, when brought to the table, are not better than a Pumpkin, and these are produced at a great expence with much trouble; and in order to have them ripe a little earlier, than they would naturally come, if suffered to grow to their full size, the stem upon which the fruit grows is commonly twisted, to prevent the nourishment entering the fruit, whereby the growth is checked; then the fruit is closely covered with the mowings of Grass-plats, laid of a sufficient depth to cause a fermentation, by which the fruit becomes coloured; but where this unnatural method is practised, the fruit hath little flesh, and that has neither moisture, firmness, or flavour; so that after four months attendance, with a great expence of dung, &c. there may perhaps be three or four brace of Melons produced, which are fitter for the dung-hill than the table. Therefore my advice is, never to attempt to have these fruit ripe earlier than the middle of *June*, which is generally soon enough for this climate; and from that time to the end of *September*, they may be had in plenty, if they are skilfully managed; and when the autumn has continued favourable, I have had them very good in the middle of *October*.

But in order to continue this fruit so long, the seeds must be sown at two different seasons; or if at three, it will be still better: the first should be sown the second week in *March*, if the season proves forward; but if it is otherwise, it will be better to defer it till the middle of that month, for the future success greatly depends on the raising the plants in strength; which cannot be so well effected, if the weather should prove so bad after the plants are come up, as that a sufficient quantity of fresh air cannot be admitted to them, therefore it is not adviseable to be too early in sowing the seeds.

These seeds may be sown on the upper side of a Cucumber-bed, where there are any; and if there are none, a
proper

proper quantity of new horse-dung must be provided, which must be thrown in a heap to ferment, and turned over, that it may acquire an equal heat, in the same manner as hath been directed for CUCUMBERS; and the plants must be raised and managed in the same manner as hath been directed for them, until they are planted where they are to remain for good; to which article the reader is desired to turn, to avoid repetition.

The second season for sowing of these seeds is the end of *March*; both these sowings must be understood to be planted under frames; for those which are designed for bell or hand-glasses, or to be covered with oil papers, should not be sown till ten or twelve days in *April*; for when these are sown earlier, if the plants are properly managed, they will extend their shoots to the sides of the glasses, before it will be safe to let them run out, for it often happens in this country, that we have sharp morning frosts in the middle of *May*; so that if the ends of these vines are then without the glasses, if they are not covered with mats, to guard them against the frost, they will be in danger of suffering greatly therefrom; and, on the other hand, if the plants have spread so much as to fill the glasses, and are not permitted to run out, they will be in equal danger of suffering by their confinement from the heat of the sun in the day time; therefore it is, that I should advise the putting of the seed in rather a little later for the glasses, than those which are to be covered with oil papers. Nor will the times here mentioned be found too late, for I have put the seeds of *Cantaleupe* Melons into a hot-bed the third of *May*, which were not transplanted, but remained where they were sown, and covered with oiled paper; and from this bed I cut a large crop of good fruit, which ripened about the latter end of *August*, and continued till the end of *October*. This I only mention, to shew what has and may be done, though it must not be always depended upon.

We next come to the making and preparing of the beds, or, as the gardeners term it, the ridges, into which the plants are to be put out to remain; these should always be placed in a warm situation, where they may be defended from all cold and strong winds, for the east and north winds are generally very troublesome in the spring of the year; so that if the place be exposed to these aspects, it will be difficult to admit a proper share of fresh air to the young plants; and if it is much exposed to the south-west winds, which often are very boisterous in summer and autumn, these will turn up and displace the vines, whereby they will suffer greatly; therefore the best position for these beds is, where they are open to the south, or a little inclining to the east, and sheltered at a distance by trees from the other points: this place should be inclosed with a good Reed fence, which is better for this purpose than any other inclosure, because the winds are deadened by the Reeds, and are not reverberated back again, as they are by walls, pales, or other close fences; but in making the inclosure, it should be extended to such distance every way from the beds, as not to obstruct the sun's rays during any part of the day; this should have a door wide enough to admit of wheelbarrows passing, to carry in dung, earth, &c. and should be kept locked, that no persons should be allowed to go in, but those who have business; for ignorant persons, having often curiosity to look into the beds, open the glasses and let the cold air to the plants, and frequently leave the glasses in part open; or sometimes when they are raised by the gardener to admit the fresh air, the tilts are thrown down, so that the air is excluded; all which are very injurious to the young plants, as is also the handling of the fruit after it is set; therefore none should be admitted, but when the person who is intrusted with the care of them is there.

The next thing is the preparation of the earth for these plants, in which the *Dutch* and *German* gardeners are very exact: the mixture which they generally prepare is of the following sorts; of Hazel loam, one third part; of the scouring of ditches or ponds a third part, and of very rotten dung a third part; these are mixed up at least one, and often two years, before they make use of it, frequently turning it over, to incorporate their parts and sweeten it; but the compost in which I find these plants succeed best in *England*, is two thirds of fresh gentle loam, and one third of rotten neats dung; if these are mixed together one year before it is wanted, so as to have the benefit of a winter's frost and summer's heat, observing to turn it over often, and never suffer weeds to grow upon it, this will be found equal to any other compost whatever.

As these plants succeed best when they are planted young, so before the plants appear there should be a quantity of new dung thrown in a heap, proportionable to the number of lights intended, allowing about fifteen good wheelbarrows full to each light; this must be two or three times turned over, to prepare it (as hath been directed for Cucumbers) and in a fortnight it will be fit for use, at which time the trench must be dug to receive the dung, where the bed is intended, which must be made rather wider than the frames, and in length proportional to the number of frames intended. As to the depth, that must be according as the soil is dry or wet; in a dry ground it should not be less than a foot, or a foot and a half deep; for the lower these beds are made, the better they will succeed, where there is no danger of their suffering by wet. In the well laying and mixing of the dung, the same care must be taken as hath been advised already for Cucumbers, which in every respect must be the same for these beds. When the bed is made, the frames should be placed over it to keep out wet; but there should be no earth laid upon it, till after it has been three or four days made, and is found of a proper temperature of heat; for many times these beds will heat so violently when they are first made, as to burn the earth, if covered with it; and when this happens, it is much the best way to take off this earth again, for the plants will never thrive in it.

As soon as the bed is found to be of a proper warmth, the earth should be laid upon it, which at first need not be more than two inches thick, except in the middle of each light, where the plants are to be placed, where there must be raised a hill eighteen inches high or more, terminating in a flat cone; in two or three days after the earth is put on the bed, it will be of a proper temperature to receive the plants; then in the evening you may transplant the plants, but always do it when there is little wind stirring: in taking up of the plants, their roots should be carefully raised with a trowel, so as to preserve all their fibres; for if these are broken off, the plants do not soon recover this; or if they do, they are generally weaker, and never make so good vines as those which are more carefully removed; for these plants are more nice and tender in transplanting than those of Cucumbers, especially the *Cantaleupe* Melon; which, if it is not planted out, soon after the third, (or what the gardeners call the rough) leaf is put out, they are long recovering their vigour; so that when it happens, that the beds cannot be ready for them in time, it will be a good method to plant each plant into a small pot while they are young, and these may be plunged into the hot bed where they were raised, or in a Cucumbe-bed where there is room, so that they may be brought forward; and when the bed is ready, they may be turned out of the pots, with the whole ball of earth to their roots, whereby they will receive no check in removing: and this latter method is what I should prefer to any other for the *Cantaleupe*, because there should

never be more than one plant left to grow in each light; therefore by this method there will be no necessity of planting more, as there will be no danger of their succeeding; whereas in the common way, most people plant two or more plants in each light, for fear one should miscarry. When the plants are placed on the top of the hills, they should be gently watered, which should be repeated once or twice after till the plants have taken good root, after which they seldom require more; for when they receive too much wet, they often canker at the root, and when that happens they never produce good fruit. When the plants have established themselves well in the new beds, there should be a greater quantity of earth laid on the bed, beginning round the hills where the plants grow, that their roots may have room to strike out; and as the earth is put in from time to time, it must be trodden or pressed down as close as possible, and at last it should be raised at least a foot and a half thick upon the dung all over the bed, observing also to raise the frames, that the glasses may not be too near the plants, lest the sun should scorch them.

When the plants have gotten four leaves, their tops should be pinched off with the finger and thumb, but not bruised or cut with a knife, because in either of these cases the wound will not so soon heal over: this pinching is to cause the plants to put out lateral branches, for these are what will produce the fruit; therefore when there are two or more of these lateral shoots produced, they must also be afterward pinched, to force out more, which must be practised often, that there may be a supply of what the gardeners call runners, to cover the bed. The management of these beds must be nearly the same as hath been directed for the Cucumbers, therefore I need not repeat it here; but shall only observe, that the Melons require a greater share of air than Cucumbers, and very little water; and when it is given to them, it should be at a distance from their stems.

If the plants have succeeded well, they will spread over the bed and reach to the frames in about six weeks, at which time the alleys between the beds should be dug out; or where there is but one bed, there should be a trench made on each side of about four feet wide, as low as the bottom of the bed, and hot dung wheeled in, to raise a lining to the same height as the dung of the bed, which should be trodden down close, and afterward covered with the same earth as was laid upon the bed, to the thickness of a foot and a half or more, treading it down as close as possible; this will add to the width of the bed, so much as to make it in the whole twelve feet broad, which is absolutely necessary; for the roots of the plants will extend themselves quite through it, so that if the extreme fibres are exposed to the air, it is common to see the vines decay, before the fruit is well grown; for where there is no addition made to the width of the bed, the roots will have reached the sides of the bed by the time that the fruit appears, and having no more room to extend themselves, their extremities are dried by the sun and air, which is soon discovered by the plants hanging their leaves in the heat of the day, which is soon after attended with a decay of many of those leaves, which are near the stem, and the plants from that time will gradually languish, so that the fruit cannot be supplied with nourishment, but when ripe will be found to have little flesh, that mealy and ill flavoured; whereas those plants which have sufficient breadth for their roots to run, and the earth laid of a proper depth and closely trod down, will remain in vigour until the frost destroys them; so that I have had a second crop of fruit on them, which have sometimes ripened well; but all the first were excellent, and of a larger size than these sorts usually grow: the leaves of these plants were very large, of a strong green, so that they

were in the utmost vigour; whereas, in most places where the *Cantaloupe* Melons have been raised in *England*, the beds have been no wider than they were first made, and perhaps not more than three inches thickness of earth upon them, so that the plants have decayed many times before they have ripened a single fruit; from whence people have imagined, that this sort of Melon was too tender for this climate, when their ill success was entirely owing to their not understanding their culture.

There is also another advantage attending this method of widening the beds, as above directed, which is that of adding a fresh warmth to the beds, by the hot dung which is buried on each side, which will cause the dung in the bed to renew its heat; and as the plants will by this time shew their fruit, this additional heat will be of great service in setting of the fruit, especially if the season should prove cold, as it sometimes happens in this country till the end of *May*. When the beds are made up in the manner here directed, and the vines have extended so far as to fill the frames, and want more room, the frames should be raised up with bricks about three inches high, to admit the shoots of the vines to run out from under them; for if the plants are strong, they will extend six or seven feet each way from their stems, especially if they are raised from new seeds; for which reason I caution every one to allow them room, and to put but one plant in each light; for when the vines are crowded, the fruit seldom will set well, but will drop off when they are as large as an egg; therefore the frames which are designed for Melons should not be made small, for the wider these are, the better will the plants thrive, and produce a greater plenty of fruit.

There is no part of gardening, in which the practitioners of this art differ more, than in the pruning and managing of these plants; nor are there any rules laid down in the several books in which the culture of Melons have been treated of, by which any person can be instructed; for there is such inconsistency in all their directions, and what is worse, the greatest part of them are absurd, so that whoever follows them can never hope to succeed; therefore I shall, in as few words as possible, give such plain directions, as I hope will be sufficient to instruct any person, who is the least conversant in these things.

I have before advised the pinching off the ends of the plants as soon as they have a joint, in order to get lateral shoots, which are by the gardeners called runners; and when these shoots or runners have two or three joints, to pinch off their tops also, to force out more runners, because it is from these that the fruit is to be produced; but after a sufficient number are put out, they should not be stopped again, but wait for the appearance of the fruit, which will soon come out in plenty; at which time the vines should be carefully looked over three times a week, to observe the fruit, and make choice of one upon each runner, which is situated nearest the stem, having the largest foot-stalk, and that appears to be the strongest fruit; then pinch off all the other fruit which may appear upon the same runner, also pinch off the end of the runner at the third joint above the fruit; this will stop the sap and set the fruit. There is also another method practised by some gardeners to set this fruit, which is the taking off some of the male flowers, whose farina is just ripe and fit for the purpose, laying them over the female flowers, which are situated on the crown of the young fruit, and with their nails gently strike the male flowers to shake the farina into the female flowers, whereby they are impregnated, and the fruit soon after will swell, and shew visible signs of their being perfectly set; so that where the plants are under frames, and the wind excluded from them, which is necessary to convey the farina from

the male to the female flowers, this practice may be very necessary; but when the fruit appears on the vines, the glasses should be constantly taken off at all times, when the weather is good, for where this is omitted, the fruit seldom sits in plenty. The taking off all the other fruit will prevent the nourishment being drawn away from the fruit intended to grow, which if they were all left on, the plant could not supply them with sufficient nourishment; so that when they come to be as large as the end of a man's thumb, they all drop off, and scarce one of them sets, which will be prevented by the method before directed: but there are some persons, who are so covetous of having a number of fruit, as not to suffer any to be taken off, whereby they generally fail in their expectation. My allowing but one fruit to be left upon each runner is, because if half of these stand, there will be full as many fruit as the plant can nourish; for if there are more than six or eight upon one plant, the fruit will be small, and not so well nourished; indeed I have sometimes seen fifteen or twenty Melons upon one plant, but these have generally been of the smaller kinds, which do not require so much nourishment as the *Cantaleupes*, whose skins are of a thick substance; so that where a greater number are left of them than the plants can well supply, their flesh will be remarkably thin.

As I before advised the stopping or pinching off the runners three joints above the fruit, so by this there will be fresh runners produced a little below the places where the others were pinched; therefore it is that I advise the careful looking over the vines so often, to stop these new runners soon after they come out, as also to pull off the young fruit which will appear; and this must be repeated as often as it is found necessary, which will be until those intended to stand are grown so large as to draw all the nourishment which the plants can supply, for then the plants will begin to abate of their vigour. These few directions, if properly made use of, is all the pruning which is necessary to be given them; but at the same time when this is practised, it may be necessary to give some water to the plants, but at a distance from their stems, which will be of service to set the fruit and cause it to swell; but this must be done with great caution.

When the plants have extended themselves from under the frames, if the weather should alter to cold, it may be necessary to cover the extremities of the vines every night with mats; for if these are injured, it will retard the growth of the fruit, and often prove very injurious to the plants: after this, what water is given to the plants should be in the alleys between the beds; for as the roots of the vines will by this time have extended themselves through into the alleys, so when the ground there is well moistened, the plants will receive the benefit of it; and by this method, the stems of the plants will be preserved dry, whereby they will continue sound; but these waterings should not be repeated oftener than once a week in very dry warm weather, but be sure to give as much air as possible to the plants, when the season is warm.

Having given full instructions for the management of those Melons which are raised under frames, I shall next proceed to treat of those which are raised under bell or hand-glasses. The plants for these must be raised in the same manner as hath been already directed, and about the latter end of *April*, if the season proves forward, will be a good time to make the beds; therefore a sufficient quantity of hot dung should be provided, in proportion to the intended number of glasses, allowing eight or nine good wheelbarrows of dung to each glass. Where there is but one bed, which is proposed to be extended in length, the trench should be dug out four feet wide, and the length accord-

ing to the number of glasses intended, which should not be placed nearer than four feet to each other; for when the plants are too near each other, the vines will intermix, and fill the bed so closely, as to prevent the fruit from setting: in digging of the trench, it should be so situated as to allow for the widening of the bed three or four feet on each side; the depth must be according as the soil is dry or wet; but, as was before observed, if the soil is so dry, as that there is no danger of the beds being hurt by the wet, the lower they are made in the ground the better: in the making of the beds, the same regard must be had to the well mixing and laying of the dung, as was before directed; and after the dung is laid, there should be a hill of earth raised, where each plant is to stand one foot and a half high; the other part of the bed need not as yet be covered more than four inches thick, which will be sufficient to keep the warmth of the dung from evaporating; then the glasses should be placed over the hills, and set down close, in order to warm the earth of the hills to receive the plants; and if the beds work kindly, they will be in a proper temperature to receive the plants, in two or three days after making; then the plants should be removed in the same manner as was before directed, and if they are in pots, so that there will be no danger of their growing, there should but one plant be put under each glass; if they are not in pots, there should be two, one of which may be afterward taken away, if they both grow. These plants must be watered at first planting, to settle the earth to their roots, and shaded every day, until they have taken new root; and if the nights prove cold, it will be proper to cover the glasses with mats, to preserve the warmth of the bed.

Where there are several of the beds intended, they should be placed at eight feet distance from each other, that there may be a proper space left between them, to be afterward filled up, for the roots of the vines to have room for extending themselves, for the reasons before given.

When the plants have taken good root in the beds, their tops must be pinched off; and their pruning, &c. must, from time to time, be the same as for those under the frames: in the day time, when the weather is warm, the glasses should be raised on the opposite side to the wind, to admit fresh air to the plants; for where this is not observed, they will draw up weak and sickly, therefore all possible care should be taken to prevent this; for if the runners have not proper strength, they can never supply the fruit with nourishment.

When the plants are grown so long as to reach the sides of the glasses, if the weather proves favourable, the glasses must be set up on three bricks, so as to raise them about two or three inches from the surface of the beds, to give room for the vines to run out from under them; but when this is done, the beds should be covered all over with earth to the depth of one foot and a half, and trod down as close as possible; and if the nights should prove cold, there should be a covering of mats put over the beds, to prevent the cold from injuring the tender shoots of the vines; but as the vines of the *Cantaleupe* Melons are impatient of wet, it will be necessary to arch the beds over with hoops, to support the mats, that they may be ready for covering at all times when they require it; which is the only sure method to have these Melons succeed in *England*, where the weather is so very uncertain and variable; for I have had some beds of these Melons in as fine order under these glasses as could be desired, which were totally destroyed by one day's heavy rain in *June*.

After the thickness of earth is laid upon the beds, if the weather should prove cold, it will be adviseable to dig trenches on each side of the beds, into which you should lay a suffi-

cient quantity of hot dung, to make it of the same thickness with the bed, after the manner before directed for the frames; or if there is a sufficient quantity of hot dung ready, the whole space between the beds may be dug out, and filled up with the dung, laying thereon the earth a foot and a half deep, treading it down close: this new dung will add a fresh warmth to the beds, and cause the plants to shew fruit soon after.

The watering of these plants must be done with great caution, and not given to their stems; the pinching of the runners must also be duly attended to, as also the pulling off all superfluous fruit, to encourage those which are designed to remain; and in short, every thing before directed for those under frames, must likewise be observed for these; and the further care is, to cover them in all hard rains and cold nights with mats; which, if performed with care, there will be little danger of their miscarrying, and these vines will remain vigorous until the cold in autumn destroys them.

There have been many persons, who of late years have raised their Melons under oiled paper, and in many places they have succeeded well; but where this is practised, there must be great care taken not to keep these coverings too close over them; for where that is done, the vines will draw very weak, and rarely set their fruit in any plenty; therefore where these coverings are proposed to be used, I should advise the bringing up of the plants under hand or bell-glasses, in the manner before directed, until they are grown far enough to be let out from under the glasses; and then, instead of the covering with mats, to put over the oiled paper; and if this covering is prudently managed, it will be the best that can be used. The best sort of paper for this purpose is that which is strong, and not of too dark colour; it should be done over with Linseed oil, which will dry soon. There should be a proportionable number of the sheets of this paper pasted together, as will spread to the dimensions of the frame to which it is to be fastened; and if this is fixed to the frame, before the oil is rubbed over it, so much the better; but this should be done so long before they are used, as that the oil may be thoroughly dry, and the stench gone off, otherwise it will hurt the plants.

There are some persons who make these frames of broad hoops, in imitation of the covers of waggons; but as these are cumbersome to move, and there are no conveniencies for admitting air to the plants, but by raising the whole frame on one side, so I prefer those made of pantile laths, framed like the ridge of a house; each slope having hinges, whereby any of the pannels may be raised at pleasure, to admit the air to the plants: but as descriptions of these things are not well comprehended by persons not so conversant with them, I shall exhibit a figure of one of these frames, to be added to the article of STOVES.

There are some few persons of quality in England, who have made the same conveniencies for their hot-beds, to raise the *Cantaloupe* Melons, as is in general practised by the *Dutch*; which is first to dig a trench in the ground ten feet wide, and in length proportional to the number of lights which are designed to cover the beds: this pit is boarded up with old ship planks, so as to make the depth full three feet and a half, or more, which pit they fill with tanners bark or dung mixed well together: then they have frames made six feet wide in the clear, which are placed in the middle of the hot-bed, whereby there will be two feet left on each side the frame within the planking, to allow room for the roots of the Melon plants to extend each way. Upon this hot-bed made with tanners bark and dung, they lay a foot and a half of good loamy earth for the plants to root into. By this method the dung, tan, and earth, is prevented from falling into the walks on the sides of the beds, so the walks

will be clean for to pass between them, which is an advantage. But as these ship-planks will not last long found, so I have made several of these trenches, the sides of which are bricked up, and the top of the wall covered with an Oak curb, to prevent the bricks from being displaced. These pits I find answer the purpose better than the other, and when their duration is considered, will be found as cheap as the other.

The further management of the Melons, after their fruit is set, is to keep pulling off all the superfluous fruit, and to pinch off all weak runners, which may draw away part of the nourishment from the fruit; as also to turn the fruit gently twice a week, that each side may have equal benefit of the sun and air; for when they are suffered to lie with the same side constantly to the ground, that side will become of a pale or whitish colour, as if it were blanched, for want of the advantages of the sun and air. The plants will require a little water in very dry weather, but this should be given them in the alleys, at a distance from the stems of the plants, and not oftener than once in a week or ten days, at which times the ground should be well soaked in the alleys. This will encourage the growth of fruit, and cause the flesh to be thick; but the great caution which is necessary to be observed, is not to over-water the plants, which is certain injury to them; also be sure to give as much free air as possible, at all times, when the weather will permit, for this is absolutely necessary to render the fruit good.

When the fruit is fully grown, they must be duly watched to cut them at a proper time; for if they are left a few hours too long upon the vines, they will lose much of their delicacy, therefore they should be looked over at least twice every day; and if those fruit which are intended for the table, are cut early in the morning, before the sun has warmed them, they will be much better flavoured; but if any should require to be cut afterward, they should be put into cold spring water, or ice, to cool them, before they are brought to the table; and those cut in the morning, should be kept in the coolest place till they are served up to table. The sign of this fruit's maturity is, that of its beginning to crack near the foot-stalk, and its beginning to smell, which never fail; for as these *Cantaloupe* Melons seldom change their colour until they are too ripe, that should never be waited for.

The directions here given for the management of the *Cantaloupe* Melons, will be found equally good for all the other sorts, as I have fully experienced; for in the common method of managing them, where the earth is laid but three or four inches thick, the plants are very apt to decay before the fruit is ripe; for their roots soon reach to the dung, and are extended to the sides of the bed, where their tender fibres are exposed to the air and sun, which causes the leaves of the plants to hang down in the heat of the day, so it is necessary to shade the plants with mats, to prevent their sudden death; for this drooping of the leaves occasions the watering of the plants often to keep them alive, which is also prejudicial to their roots; whereas, when the beds are made of a proper width, and earthed of a sufficient thickness, the plants will bear the strongest heat of the sun in this climate, without shewing the least want of moisture, or their leaves drooping, and they will continue in health till the autumn cold destroys them.

In saving of the seeds, I need not repeat here, that only such should be regarded which are taken from the firmest fruit, and those which have the highest flavour; and if these are taken out with the pulp entire, without displacing the seeds, and suffered to remain in the pulp two or three days before it is washed out, the better; and then to preserve only the heavy seeds, which sink in the water.

MELOCACTUS. } See Cactus.
MELOCARDUUS. }

MELOCHIA. See Corchorus.

MELON. See Melo.

MELONGENA. *Tourn. Inst. R. H. 151. tab. 65.* Mad Apple, by some called Egg Plant.

The Characters are,

The flower has but one petal, which is cut into five parts, and reflexed. It hath five awl-shaped stamina. In the center is situated an oblong germen, which afterward becomes an oval or oblong fruit with one cell, with a fleshy pulp, filled with compressed roundish seeds.

The Species are,

1. MELONGENA caule inermi herbaceo, foliis oblongo-ovatis tomentosis integris, fructu ovato. Mad Apple with an oblong Violet-coloured fruit.

2. MELONGENA caule inermi herbaceo, foliis oblongo-ovatis tomentosis, fructu tereti. Mad Apple with a taper Violet-coloured fruit.

3. MELONGENA caule inermi herbaceo, foliis oblongis sinuatis tomentosis, fructu incurvo. Mad Apple with an incurved fruit.

4. MELONGENA spinosa, foliis sinuato-lacinatis, fructu tereti, caule herbaceo. Apple-bearing Nightshade, with prickly leaves and fruit.

The first sort grows naturally in *Asia, Africa, and America*, where the fruit is commonly eaten by the inhabitants; it is cultivated in the gardens in *Spain* as an esculent fruit, by the title of *Barenkeena*; the *Turks*, who also eat the fruit, call it *Badinjan*, the *Italians* *Melanzana*, and the inhabitants of the *British* islands in *America* *Brown John*, or *Brown Jolly*. It is an annual plant, with an herbaceous stalk, which becomes ligneous, and rises from two to three feet high, sending out many side branches, garnished with oblong, oval, woolly leaves, whose borders are very slightly sinuated. The flowers come out singly from the side of the branches, which have a thick fleshy empalement, deeply cut into five acute segments, armed with strong prickles on the outside. The flowers have one petal, which is cut at the brim into five segments, which expand in form of a star, but are a little reflexed; they are blue, and the summits which are connected together in the bosom of the flower are yellow. The flowers are succeeded by oval fleshy fruit about the size and shape of a swan's egg, of a dark purple on one side, and white on the other.

There are the following varieties of this species; one with white fruit, called by some the *Egg Plant*; one with yellow fruit, and another with pale red fruit; all these varieties are generally constant, the seeds producing the same fruit as those from which they were taken, but as they only differ in colour, so I choose not to enumerate them as distinct species.

The second sort differs from the first in the shape of the fruit, which is commonly eight or nine inches long, taper and strait; in other respects they are the same, but as this never varies when propagated in gardens, so there can be no doubt of its being a distinct species. There are two varieties of this sort, one with a purplish fruit, and the other white, but the latter is the most common in *England*.

The third sort differs from the two former in the shape of the leaves, which are deeply sinuated on their borders. The fruit is oblong and incurved, of a yellowish colour, and larger at the end than in any other part.

The fourth sort grows naturally in *India*. This differs greatly from either of the former. The stalks and leaves are armed with very strong thorns; the leaves are larger, and deeply jagged on their sides. The flowers are larger, and of a deeper blue colour. The fruit is long, taper, and white.

These fruit are eaten by most of the inhabitants of the warm parts of the globe, and are esteemed a delicacy, but are supposed to have a property of provoking lust.

They are propagated by seeds, which should be sown upon a moderate hot-bed early in *March*; when the plants come up, they must be transplanted into another hot-bed about three or four inches asunder, observing to water and shade them until they have taken root; after which they must have a great share of air when the weather is warm, otherwise they will draw up very weak. They must also be frequently watered, without which they will make but very indifferent progress. When the plants are grown so strong as to fill the frame (which will be by the middle or end of *May*) you must transplant them out into a rich spot of ground, at two feet distance, or into the borders of the pleasure-garden at the same distance from other plants, observing to preserve as much earth to the roots as possible when you take them up, otherwise they are subject to miscarry. They must have water plentifully, until they have taken root; after which they will require but very little care, more than to keep them clear from weeds, and in very dry weather to give them some water.

These plants are only preserved as curiosities in the *English* gardens, the fruit being seldom eaten in this country, except by some *Italians* or *Spaniards*, who have been accustomed to eat them in their own countries.

MELOPEPO. See Cucurbita.

MELOTHRIA. *Lin. Gen. Plant. 48.*

The Characters are,

The flower is of one leaf, wheel-shaped. In the center of the flower is situated the germen, attended by three conical stamina, inserted in the tube of the flower. The germen afterward becomes an oval small berry, having three divisions, in which are lodged small flat seeds.

We have but one Species of this plant, viz.

MELOTHRIA. *Lin. Hort. Cliff. 490.* Smallest Cucumber, with a smooth, black, oval fruit.

This plant grows wild in the woods in *Carolina, Virginia*, and also in many of the islands in *America*; the vine spreads upon the ground, having angular leaves, resembling those of the Melon, but much smaller. These vines strike out roots at every joint, which fasten themselves into the ground, by which means their stalks extend to a great distance each way. The flowers are very small, in shape like those of the Melon, of a pale sulphur colour. The fruit in the *West-Indies* grows to the size of a Pea, of an oval figure, and changes black when ripe; these are by the inhabitants sometimes pickled when they are green.

In *England* the fruit are much smaller, and are so hidden by the leaves, as to render it difficult to find them. The plants will not grow in the open air here, but must be sown upon a hot-bed, and if they are permitted, will soon spread over the surface, when the fruit is ripe; if they scatter their seeds, the plants will come up where the earth happens to be used on a hot-bed again. This is preserved in some gardens for the sake of variety, but is of no use.

MENISPERMUM. *Tourn. Art. R. Par. 1705.* Moonseed.

The Characters are,

The flower has six oblong, oval, concave petals, and six stamina which are shorter than the petals, with three almost oval germen on the top of the styles, crowned by obtuse indented stigmas. The germen afterward turn to three oval berries with one cell, each inclosing one moon-shaped compressed seed.

The Species are,

1. MENISPERMUM foliis peltatis subrotundis angulatis. *Hort. Cliff. 140.* Climbing Moonseed of *Canada*, with a navel-shaped leaf.

2. *MENISPERMUM foliis cordatis peltatis lobatis. Flor. Virg.*
40. Moonseed with an Ivy leaf.

3. *MENISPERMUM foliis cordatis subtus villosis. Lin. Sp. Plant.* 340. Moonseed with heart-shaped leaves, which are hairy on their under side.

The first sort grows naturally in the woods of *Canada, Virginia*, and most parts of *North America*. It hath a thick ligneous root, from which are sent out many climbing stalks, which become ligneous, and rise to the height of twelve or fourteen feet, twisting themselves about the neighbouring plants for support, and are garnished with large, smooth, roundish leaves, whose foot-stalks are placed almost in the middle of them; on the upper side there is a hollow in that part of the leaf, resembling a navel. The flowers come out in loose bunches from the side of the stalks; they are of an herbaceous colour, small, and composed of six oblong oval petals, and six very short stamina, terminated by single summits; the three germen situated in the center, turn to so many channelled berries, each containing one compressed seed.

This sort may be easily propagated by laying down of the branches, which, if performed in autumn, they will have made good roots by that time twelve-month, when they may be separated from the old plant, and transplanted where they are designed to remain; these plants require support, for their branches are slender and weak. In the country, where it grows naturally, they climb up the trees to a considerable height; so that if these are planted near trees in wilderness quarters, where their stalks may have support, they will thrive better than in an open situation.

The second sort differs from the first in the shape of its leaves, which are angular; their foot-stalks join to the base of the leaves, so have no umbilical mark on their surface. The stalks of this become ligneous, and rise as high as those of the first sort; the flowers and berries do not differ from them. It is propagated after the same manner.

The third sort grows naturally in *Carolina*. This has by some been supposed the same with the second sort, but it differs from that in its roots, not becoming woody as those do. The stalks are also herbaceous; the leaves are entire and hairy, not more than half so large as those of the second, nor is the plant so hardy. This sort does not produce flowers in *England*, unless the season proves very warm.

This may be propagated by parting of the roots; the best time for doing this is in the spring, a little before the plants begin to shoot; these should be planted in a warm situation and a light soil, for in strong land, where the wet is detained in winter, the roots are apt to rot; therefore if they are planted close to a wall exposed to the south or west, their stalks may be fastened against the wall, to prevent their trailing upon the ground, and in this situation the plants will frequently flower, and by a little shelter in severe frost, their stalks may be preserved from injury.

MENTHA. Tourn. Inst. R. H. 188. tab. 89. Mint.

The Characters are,

It hath a lip flower of one petal. The mouth is cut into four almost equal segments, the upper being a little larger and indented. It hath four erect stamina, the two nearest being longest. In the bottom of the tube is situated a four-pointed germen, which afterward turns to four naked seeds sitting in the empalement.

The Species are,

1. *MENTHA floribus spicatis, foliis oblongis serratis. Hort. Upsal.* 168. Mint with spiked flowers; commonly called Spear Mint.

2. *MENTHA floribus spicatis, foliis longioribus glabris, superne minimè serratis.* Narrow-leaved, smooth-spiked Mint.

3. *MENTHA foliis lanceolatis serratis, subtus incanis, floribus spicatis hirsutissimis.* Mint with spear-shaped sawed leaves, which are hoary on their under side, and very hairy spiked flowers.

4. *MENTHA spicis confertis, foliis serratis tomentosiss sessilibus. Hort. Cliff.* 306. Wild Mint with a longer leaf.

5. *MENTHA spicis crassioribus, foliis ovato-lanceolatis serratis subtus tomentosiss petiolatis.* Hairy Water Mint with a thicker spike.

6. *MENTHA spicis crassioribus interruptis, foliis lanceolatis acutè serratis.* Blackish hot Mint, with a taste like Pepper; commonly called Pepper Mint.

7. *MENTHA floribus spicatis, foliis cordatis dentatis undulatis sessilibus. Hort. Cliff.* 306. Danish or German curled Mint.

8. *MENTHA spicis confertis, foliis ovatis rugosis sessilibus.* Wild Mint with a rounder rough leaf, and a spiked flower having a strong scent.

9. *MENTHA spicis confertis interruptis, foliis oblongo-ovatis acuminatis dentatis sessilibus.* Round-leaved red Mint, smelling like an Orange; commonly called Orange Mint.

10. *MENTHA foliis oblongis dentatis, utrinque tomentosiss sessilibus, spicis tenuioribus.* Narrow-leaved wild Mint of *Aleppo*, which rarely flowers.

11. *MENTHA floribus capitatis, foliis ovatis serratis petiolatis, staminibus corollâ longioribus. Hort. Cliff.* 306. Greater, round-leaved, Water Mint.

12. *MENTHA floribus capitatis, foliis lanceolatis serratis subpetiolatis. Lin. Sp. Plant.* 576. Broad-leaved, blackish, hot Mint, or Pepper Mint.

13. *MENTHA floribus verticillatis, foliis ovatis acutis serratis, staminibus corollâ brevioribus. Lin. Sp. Plant.* 577. Whorled hairy Field Mint, or Calamint of the shops.

14. *MENTHA floribus verticillatis, foliis ovatis dentatis, staminibus corollâ longioribus.* Smallest Water Mint.

15. *MENTHA floribus verticillatis, foliis ovatis, marginibus ciliatis, staminibus corollam æquantibus.* Whorled Mint with a rounder leaf, smelling like Basil.

16. *MENTHA floribus verticillatis, foliis ovatis serratis hirsutis, staminibus corollâ longioribus.* Common, hairy, Water Mint, or Silymbrium.

17. *MENTHA floribus verticillatis, foliis lanceolatis acutis serratis, rugosis, staminibus corollam æquantibus.* Whorled Mint with a longer acute-pointed leaf, and an aromatick scent.

18. *MENTHA floribus verticillatis, foliis oblongo-ovatis rugosis serratis, staminibus corollâ longioribus.* Curled Mint with whorled flowers, and a rounder leaf.

The first sort is what the gardeners cultivate to supply the markets, which is used both as a culinary herb, and for medicine. It is generally called Spear Mint, and by some Hart Mint, or *Roman Mint*. This is a plant so well known, as to need no description. There are two varieties of this, one with a curled, and the other has variegated leaves, but both these run from the common sort; these are by some preserved in their gardens for the sake of variety, therefore I have mentioned them here.

The second sort hath smoother and narrower leaves than the first, but in other respects it agrees with that, so that it is frequently cultivated in the gardens for use, without distinction.

The third sort grows naturally in moist places. The leaves of this are shorter, and broader in the middle than either of the former; the serratures on their edges are more acute, and their under sides are woolly. The scent of this sort is very like that of the Garden Mint.

The fourth sort hath longer and broader leaves than either of the former, which are woolly and white. The serratures on their edges are farther asunder; they are hairy, and very sharp pointed. The spikes of flowers are slender, hairy, several of them grow together at the top of the stalk. This is the *Mentastrum*, or wild Mint of the shops, and is an ingredient in the *Trochisci de Myrrha*.

The fifth sort grows naturally in several parts of *England*; it is titled Spiked Horse Mint, or Water Mint. The stalks of this are shorter than those of either of the former; the leaves are oval, spear-shaped, of a pale colour, sawed on their edges. The flowers grow in short thick spikes at the top of the stalks, their stamina being shorter than the petal.

The sixth sort grows naturally by the side of the river between *Mitcham* and *Croydon* in *Surry*. This hath smooth purple stalks; the leaves are smaller than those of common Mint, sawed on their edges, of a darker green colour than either of the former; their midrib and veins are purple, and a little hairy on their under side. The spikes of flowers are shorter and thicker than those of the common Mint, and are broken, or interrupted at the bottom. The whole plant has a hot biting taste like Pepper, and a pleasant scent.

The seventh sort was originally brought from *Denmark*, where it was thought to grow naturally, but Dr. *Linnaeus* fixes it as a native of *Siberia*. The stalks of this sort are hairy, and rise about the same height with the common. The leaves are heart-shaped, deeply indented on their edges, waved and curled, and fit close to the stalk; they are of a light green. The flowers are purple, growing in thick interrupted spikes at the top of the stalks; their empalements are cut almost to the bottom, and the style of the flower is bifid, standing out beyond the petal.

The eighth sort grows naturally in many parts of *England*. This rises with a strong hairy stalk, about the same height as the common Mint, garnished with oval rough leaves fitting close; they are of a dark green, and crenated on their edges. The spikes of flowers grow in clusters at the top of the stalks, which are short and close; their stamina are stretched out beyond the petal.

The ninth sort is commonly called Orange Mint, from its scent, which is somewhat like that of the rind of Orange. This rises with an upright smooth stalk about the same height with the common Mint, but does not branch out like that; the leaves are much broader than those of the common sort, the indentures on their edges are deep, and they end in acute points. The spikes of flowers grow in clusters on the top of the stalks, which are interrupted; their stamina are shorter than the petal. It is commonly cultivated in gardens for its pleasant scent.

The tenth sort grows naturally at *Aleppo*, but is hardy enough to thrive in the open air in *England*. This hath slender stalks, which are purple at bottom, but woolly upward, seldom branching, garnished with oblong indented leaves, which are downy on both sides, fitting close to the stalks. The spikes of flowers are single, and very slender, but do not often appear in *England*, but when they do it is late in the summer. It creeps much at the root, so the only way to obtain flowers, is to confine their roots in pots.

The eleventh sort grows naturally in ditches in most parts of *England*, and is commonly known by the name of Water Mint. This hath hairy stalks about a foot high, which branch toward the top, garnished with oval sawed leaves, standing upon pretty long foot-stalks. The flowers grow in roundish spikes at the end of the branches, of a purple colour, and their stamina are longer than the petal. The whole plant has a very strong scent, somewhat like that of Pennyroyal.

The twelfth sort grows naturally in ditches in several parts of *England*. The stalks of this are purple, smooth, and short; the leaves are small, spear-shaped, of a dark colour, and are slightly sawed on their edges. The flowers grow in roundish heads on the top of the stalks; their stamina are longer than the petal. This sort has a warm biting taste, but not quite so hot as the Pepper Mint before described, but is often used for it.

The thirteenth sort grows naturally in arable land in most parts of *England*, and is rarely admitted into gardens. This is the Water Calamint of the shops, but is now seldom used in medicine. The stalks of this sort rise about a foot high, are hairy, garnished with oval leaves, ending in acute points, sawed on their edges. The flowers grow in very thick whorls round the stalks; they are small, of a purple colour, and their stamina are shorter than the petal.

The fourteenth sort grows in watery places in many parts of *England*. This hath weak trailing stalks a foot and a half long, garnished with small oval leaves, which are indented on their edges, and stand upon pretty long foot-stalks. The flowers grow in thick whorls round the stalks, and their stamina are longer than the petal.

The fifteenth sort grows plentifully on the side of the road between *Bocking* and *Gosfield* in *Effex*. The stalks of this are much smaller, and not so long as those of the former; the leaves are shorter and rounder, and are very little indented on their edges, but have their borders set with hairs. The whorls of flowers are smaller, and the whole plant has the scent of Basil.

The sixteenth sort grows naturally in ditches in many parts of *England*. This hath hairy stalks a foot or more in height; the leaves are oval, sawed, and very hairy. The flowers grow in large whorls toward the top of the stalks, and their stamina are longer than the petals. This hath a pleasanter scent than the common Water Mint, so is called Sweet Water Mint, by way of distinction.

The seventeenth sort grows naturally by the side of the river *Medway*, between *Rocheester* and *Chatham*. This hath hairy stalks near two feet high, garnished with spear-shaped leaves, ending in acute points; the stalks are beset with whorls of flowers, almost their whole length, so that they have frequently ten or twelve whorls on each. The flowers are purplish, and their stamina are equal with the petals: this hath a very pleasant aromattick scent.

The eighteenth sort grows naturally in *Holland*, between *Leyden* and *Haerlem*. This hath purple smooth stalks, which rise about the same height as the common Mint, garnished with oblong oval leaves, which are rough and sawed on their edges, having very short foot-stalks. The flowers grow in whorls toward the top of the stalks; under each of these are placed two very small leaves, in which this differs from most of the other whorled Mints.

All the sorts of Mint are easily propagated by parting the roots in spring, or by planting cuttings during any of the summer months, but they should have a moist soil; and after the cuttings are planted, if the season should prove dry, they must be often watered, until they have taken root; after which they will require no farther care, but to keep them clear from weeds: they should be planted in beds about four feet wide, allowing a path two feet broad, to go between the beds to water, weed, and cut the plants. The distance they should be set is about five or six inches, or more, because they spread very much at their roots; for which reason, the beds should not stand longer than three years, for by that time the roots will be matted so closely, as to rot and decay each other, if permitted to stand longer. There are some people who are very fond of Mint fallad in winter and spring; in order to obtain which, they take up the roots before *Christmas*, and plant them upon a moderate hot-bed close together, covering them with fine earth about an inch thick, and cover the bed either with mats or frames of glass. In these beds the Mint will come up in a month's time, and be soon fit to cut for that purpose.

When the herb is cut for medicinal use, it should be done in a very dry season, just when it is in flower; for if it stand longer, it will not be near so handsome, nor so well

well tasted; and if it be cut when it is wet, it will change black and be little worth; this should be hung up to dry in a shady place, where it may remain until it be used.

MENTHA CATARIA. See Nepeta.

MENTZELIA. Plum. Nov. Gen. Plant. 40. tab. 6.

The Characters are,

The flower hath five petals a little longer than the empalement, and many erect bristly stamina. From the long cylindrical germen, which is situated under the flower, arises a bristly style. The germen afterward turns to a cylindrical long capsule with one cell, containing many small seeds.

We know but one Species of this genus, viz.

MENTZELIA. Hort. Cliff. 492. Plumier titles it *Mentzelia foliis & fructibus asperis*. Nov. Gen. Plant. 41. Mentzelia with prickly leaves and fruit.

This plant grows plentifully at *La Vera Cruz*.

The plant is annual, it rises with a slender, smooth, stiff stalk, a little woody, more than three feet high, branching out alternately at distances; the branches are distorted, and run into one another; these are garnished with leaves shaped like the point of a halbert, standing alternately upon short foot-stalks, covered with short hooked prickles, which fasten themselves into the clothes of those who rub against them. The flowers come out singly from the joints of the stalk, resting upon a cylindrical germen, which is near an inch in length, narrow at the base, but widens upward. Upon the top of it comes out the empalement, after the same manner as those of the *Onagra*; the flowers are of a pale yellow colour. In the middle arises a great number of stamina which are erect, terminated by single summits; from the germen arises a single style, crowned by a single stigma. The germen afterward turns to a long cylindrical capsule, armed with prickles as the leaves, which also fasten themselves to the clothes of those who rub against them; these have but one cell, which is filled with small seeds.

As this is an annual plant, which perishes soon after the seeds are ripe, so the seeds must be sown on a hot-bed early in the season, that the plants may be brought forward early in the spring, otherwise they will not produce ripe seed in this country. When the plants are come up about an inch high, they should be each transplanted into a separate pot, and plunged into a hot-bed of tanners bark, being careful to shade them from the sun until they have taken new root; then they must be treated in the same manner as other tender annual plants.

MENYANTHES, is the *Trifolium Palustre*, or Bog Bean.

This plant is common upon boggy places in divers parts of *England*; but as it is never cultivated in gardens, so I shall not trouble the reader with any further account of it.

MERCURIALIS. Tourn. Inst. R. H. 534. tab. 308.

The Characters are,

It is male and female in different plants; the male flowers have a spreading empalement, cut into three concave segments, but have no petals; they have nine or twelve erect hairy stamina. The female flowers have no petals, but have two awl-shaped, acute-pointed nectariums; to each of these there is a single broad germen, which afterward turns to a twin capsule shaped like a *scrotum*, having two cells, each containing one roundish seed.

The Species are,

1. MERCURIALIS caule brachiato, foliis glabris. Hort. Cliff. 461. Mercury with spiked and testiculated flowers, which are male and female.

2. MERCURIALIS caule simplicissimo, foliis scabris. Hort. Cliff. 461. Mountain Mercury, or Dog's Mercury, with spiked and testiculated flowers.

3. MERCURIALIS caule subfruticoso, foliis tomentosis. Hort. Cliff. 461. Shrubby hoary Mercury, having spiked and testiculated flowers.

The first sort is commonly called *French Mercury*, from whence it might have been brought into *England*; for although it is now become a weed in gardens and upon dung-hills, yet it is seldom found growing at a distance from habitations. This is an annual plant, with a branching stalk about a foot high, garnished with spear-shaped leaves, of a pale or yellowish green colour. The male plants have spikes of herbaceous flowers, growing on the top of the stalk; these fall off soon; but the female plants, which have testiculated flowers proceeding from the side of the stalks, are succeeded by seeds, which, if permitted to scatter, will produce plenty of plants of both sexes.

The second sort grows under hedges and in woods in most parts of *England*. This hath a perennial root, which creeps in the ground; the stalks are single and without branches, rising ten or twelve inches high, garnished with rough leaves, placed by pairs at each joint, of a dark green colour, indented on their edges; these have their male flowers growing in spikes upon different plants, from those which produce seeds.

The third sort grows naturally in the south of *France*, in *Spain*, and *Italy*. This rises with a shrubby branching stalk a foot and a half high, garnished with oval leaves placed by pairs, which are covered with a white down on both sides. The male flowers grow in short spikes from the side of the stalks, upon different plants from the fruit, which are testiculated and hoary. If the seeds of these are permitted to scatter, the plants will come up the following spring; and if the seeds are sown, it should be performed in the autumn, for those which are sown in the spring never grow the same year. This plant should have a warm situation and a dry rubbishy soil, in which it will live three or four years, but in hard frost these plants are frequently killed.

MESEMBRYANTHEMUM. Dill. Gen. 9. Hort. Elth. 179. Ficoides, or Fig Marygold.

The Characters are,

The flower hath one petal, which is cut into many linear segments almost to the bottom, and ranged in several series, but are joined together at their base; within these are ranged a great number of hairy stamina. Under the flower is situated an obtuse five-cornered germen, supporting sometimes five, and often ten or more styles. The germen afterward becomes a roundish fleshy fruit, having as many cells as there are styles, filled with small seeds.

The Species are,

1. MESEMBRYANTHEMUM foliis alternis teretiusculis obtusis ciliatis. Hort. Upsal. 129. Fig Marygold of *Naples* with a white flower, or *Egyptian Kali*.

2. MESEMBRYANTHEMUM foliis alternis ovatis obtusis undulatis. Hort. Cliff. 216. African Fig Marygold, with a waved Plantain leaf, marked with silvery spots; commonly called the *Diamond Ficoides*, or *Diamond Plant*.

3. MESEMBRYANTHEMUM foliis semiteretibus, floribus sessilibus axillaribus. Lin. Sp. Plant. 481. Fig Marygold of the *Cape*, with a taper leaf and a whitish flower.

4. MESEMBRYANTHEMUM foliis semicylindraccis, floribus quadrifidis. Lin. Sp. Plant. 481. Upright, ligneous, Fig Marygold of *Africa*, with a radiated flower, which is at first purple, afterward silvery, shut in the day, and opens at night.

5. MESEMBRYANTHEMUM foliis semiteretibus falcatis, caule arborecente. African Tree Fig Marygold, with a taper leaf, and a white flower opening at night, but shut in the day.

6. MESEMBRYANTHEMUM foliis subtrigonis, subulatis, caule erecto, corymbo trichotoma. Lin. Sp. Plant. 481. Upright African Fig Marygold, with a taper leaf, and white flowers growing in umbels.

7. MESEMBRYANTHEMUM *acaule, foliis subteretibus connatis, floribus octagynis. Lin. Sp. Plant. 481.* Low Fig Marygold of the Cape, with an Onion leaf, and a staminate flower.

8. MESEMBRYANTHEMUM *foliis lanceolatis planis crenulatis. Hort. Cliff. 217.* Trailing, African, Fig Marygold, with a Tripolium leaf and a silvery flower.

9. MESEMBRYANTHEMUM *acaule, foliis triquetris linearibus apice trifariam dentatis. Hort. Cliff. 218.* Dwarf Fig Marygold of the Cape, with a triangular leaf indented at the top, and a smaller purplish flower.

10. MESEMBRYANTHEMUM *acaule, foliis subulatis triquetris dorso supernè ferratis.* Dwarf Mesembryanthemum, with awl-shaped three-cornered leaves, whose back part is sawed toward the top.

11. MESEMBRYANTHEMUM *caulescens, foliis deltoidibus triquetris dentatis. Hort. Cliff. 218.* African Fig Marygold, with a short, thick, gray, triangular leaf, with prickles on the three edges.

12. MESEMBRYANTHEMUM *caulescens, foliis deltoidibus, lateribus minimè dentatis.* African Fig Marygold, with very thick, short, triangular, gray leaves, having small indentures on their edges.

13. MESEMBRYANTHEMUM *acaule, foliis apice barbatis.* African Fig Marygold with a rough spotted leaf, whose point is armed with spines in form of a star.

14. MESEMBRYANTHEMUM *caulibus subfruticosis decumbentibus, foliis teretibus apice barbatis.* Shrubby Fig Marygold of the Cape, with a star-pointed tumid leaf, and a purple flower.

15. MESEMBRYANTHEMUM *caule hispido, foliis cylindricis deflexis. Lin. Sp. Plant. 482.* African, shrubby, Fig Marygold, having stalks adorned with silvery down, and long, small, taper leaves, spotted as it were with silvery drops, and a Violet-coloured flower.

16. MESEMBRYANTHEMUM *caule foliisque pubescentibus. Hort. Cliff. 217.* Mesembryanthemum, whose stalks and leaves are garnished with downy hairs.

17. MESEMBRYANTHEMUM *foliis subulatis subtus undique scabris. Hort. Cliff. 219.* African Fig Marygold, with a long, green, rough, triangular leaf, and a Violet-coloured flower.

18. MESEMBRYANTHEMUM *articulis caulinis terminatis in folia acuminata subtus dentata. Hort. Cliff. 218.* African Fig Marygold, with a short, perfoliated, triangular leaf, whose point is prickly; commonly called Buckhorn Ficoides.

19. MESEMBRYANTHEMUM *perfoliatum, foliis majoribus, apicibus triacanthis. Hort. Elth. 251.* Shrubby, perfoliate, African Fig Marygold, with a triangular, gray, spotted leaf, and a thin, white, ligneous bark; commonly called Stag-horn Ficoides.

20. MESEMBRYANTHEMUM *spinis ramosis. Hort. Cliff. 216.* African Fig Marygold with long spines, and smaller leaves arising from the wings of the large leaves.

21. MESEMBRYANTHEMUM *foliis subulatis papillofis, radice capitata. Hort. Cliff. 216.* African Fig Marygold, with a triangular recurved leaf, and umbellated flowers of a dark colour, which are purple on their outside.

22. MESEMBRYANTHEMUM *foliis subulatis semiteretibus glabris, internodio longioribus. Hort. Cliff. 216.* Low Fig Marygold of the Cape, with a taper leaf, and a scarlet flower.

23. MESEMBRYANTHEMUM *foliis subulatis subcylindraceis obsolete papillofis distinctis. Hort. Cliff. 220.* Upright, tree-like, African Fig Marygold, with a jointed stalk, and a green leaf.

24. MESEMBRYANTHEMUM *caule repente semicylindraceo, foliis semicylindricis lævibus connatis, apice triquetris. Hort. Cliff. 217.* Creeping, African, Fig Marygold, with a green triangular leaf, and deep purple-coloured flower.

25. MESEMBRYANTHEMUM *foliis acinaciformibus distinctis lævibus, ramis teretibus. Hort. Cliff. 219.* African Fig Marygold, with a triangular, cimeter-shaped, short leaf, and a pale purplish flower.

26. MESEMBRYANTHEMUM *foliis acinaciformibus connatis lævibus, caule decumbente.* Greater, trailing, African Fig Marygold, with a triangular cimeter-shaped leaf.

27. MESEMBRYANTHEMUM *falcatum majus, flore amplo luteo. Hort. Elth. 283.* Greater, trailing, African Fig Marygold, with a triangular leaf, and a large eatable fruit.

28. MESEMBRYANTHEMUM *foliis subtriquetris scabris, corollis bicoloribus. Lin. Sp. Plant. 485.* Shrubby Fig Marygold of the Cape, with a taper leaf, having punctures, and flowers with yellow and red petals.

29. MESEMBRYANTHEMUM *foliis subulatis triquetris, angulo carinali retrorsum ferratis. Hort. Cliff. 218.* African Fig Marygold with a long triangular leaf, which is incurved, and a purple stalk.

30. MESEMBRYANTHEMUM *foliis subulatis subcylindraceis papillofis distinctis, caule scabro. Hort. Cliff. 220.* Fig Marygold of the Cape, with a silvery taper leaf, and flowers having many Orange-coloured petals.

31. MESEMBRYANTHEMUM *foliis linearibus obsolete triquetris distinctis, summis imbricatis, lævibus. Hort. Cliff. 220.* Shrubby Fig Marygold of the Cape, with taper gray leaves growing in clusters, and a white flower.

32. MESEMBRYANTHEMUM *acaule, foliis semicylindricis connatis externè tuberculatis. Hort. Cliff. 219.* African Fig Marygold, with a long, triangular, succulent leaf, and red stalks.

33. MESEMBRYANTHEMUM *foliis subcylindricis acutis connatis arcuatis lævibus. Hort. Cliff. 220.* African Tree Fig Marygold, with a taper gray leaf, having a thick purple top.

34. MESEMBRYANTHEMUM *foliis subulatis triquetris strictis acutis, punctis pellucidis obsolete sparsis. Hort. Cliff. 220.* African Fig Marygold with an erect ligneous stalk, a triangular, cimeter-shaped, rough leaf, and a large yellow flower.

35. MESEMBRYANTHEMUM *caulescens, foliis subulatis semicylindricis recurvis connatis longis. Hort. Cliff. 219.* African Fig Marygold with a long triangular leaf, having obtuse borders, and a large flower of a pale yellow within, and marked with a long red streak on the outside.

36. MESEMBRYANTHEMUM *caulibus procumbentibus, foliis subtriquetris angulis obtusioribus recurvis connatis, pedunculis brevioribus.* Trailing, African, Fig Marygold, with a longer, gray, triangular leaf, and a yellowish flower.

37. MESEMBRYANTHEMUM *foliis planis oppositis ovatis acuminatis connatis integerrimis.* Trailing, African, Fig Marygold, with plain leaves set by pairs, which are lucid, surround the stalk with their base, and a large, whitish, yellow flower.

38. MESEMBRYANTHEMUM *foliis planis congestis externè punctatis acuminatis integerrimis.* Trailing Fig Marygold of the Cape, with an Olive leaf, and a white flower of a Saffron colour in the middle.

39. MESEMBRYANTHEMUM *subacaule, foliis ciliato-dentatis. Lin. Hort. Cliff. 218.* Low Fig Marygold of the Cape, with a triangular leaf indented toward the top, and a yellow flower; commonly called Dogs Chap Ficoides.

40. MESEMBRYANTHEMUM *acaule, foliis crassis triquetris, margines laterales ciliato dentatis, pedunculis brevibus.* African Fig Marygold with a triangular, cimeter-shaped, short, thick leaf, whose borders have many large spines; commonly called Cats Chap Ficoides.

41. MESEMBRYANTHEMUM *foliis dolabriformibus. Hort. Cliff. 219.* Low Fig Marygold of the Cape, with leaves like a stag's horn, and a yellow flower opening at night.

42. MESEMBRYANTHEMUM *foliis difformibus*. Prod. Leyd. 287. African Fig Marygold with very broad, thick, shining, deformed leaves.

43. MESEMBRYANTHEMUM *acaule, foliis linguiformibus altero margine crassioribus*. Hort. Cliff. 219. African Fig Marygold without stalk, broad, thick, shining leaves growing by pairs, and a very large yellow flower.

44. MESEMBRYANTHEMUM *acaule, foliis linguiformibus latissimis, pedunculis brevioribus*. African Fig Marygold having no stalk, very broad, thick, shining leaves placed by pairs, and a large golden flower with a short foot-stalk.

45. MESEMBRYANTHEMUM *subacaule foliis subtriquetris glaucis integerrimis obtusioribus*. African Fig Marygold with a thick, triangular, succulent leaf.

46. MESEMBRYANTHEMUM *foliis alternis subulatis triquetris longissimis*. Hort. Cliff. 216. Fig Marygold of the Cape, with a Clove Gilliflower leaf, and a beautiful gold-coloured flower.

47. MESEMBRYANTHEMUM *foliis subulatis triquetris incurvis, ramis dependentibus*. African Fig Marygold with a long triangular leaf, of a gray colour, whose edges are obtuse.

These plants are most of them natives of the *Cape of Good Hope*, from whence their seeds were first brought to *Holland*, and the plants raised in many of their curious gardens, and have since been communicated to most parts of *Europe*.

Most of the plants of this genus have beautiful flowers, which appear at different seasons of the year; some of them flower early in the spring, others in summer, some in the autumn, and there are others which flower in winter; and many of them produce their flowers in such quantity, as that when they are expanded, the plants are entirely covered with them; they have all of them thick succulent leaves, but some of the species are much more so than others, and the figures of their leaves vary so much in the several species, that they afford an agreeable variety when they are not in flower.

All the sorts here mentioned are perennial plants, except the two first, which are annual. The perennial sorts are easily propagated by cuttings during any of the summer months; such of them as have shrubby stalks and branches, do very readily take root when planted in a bed of light soil, and covered either with mats or glasses, but when they are covered with the latter, they must be shaded every day when the sun is warm; the cuttings of the shrubby sorts, need not be cut from the plants more than four or five days before they are planted; during which time they should be laid in a dry room, not too much exposed to the sun, that the part which was separated from the old plants, may heal over and dry before they are planted, otherwise they are apt to rot. When the cuttings are taken from the old plants, they should be divested of their lower leaves, so far as may be necessary, to allow a naked stalk of sufficient length for planting.

When the cuttings are planted, it will be necessary to give them a little water to settle the ground about them, but it should be done with caution, for too much wet will spoil them; but if there should happen some gentle showers of rain, it will be proper to take off their covers, and let them receive it, but they should be screened from hard rains. The cuttings thus managed will put out good roots in about six weeks, when they should be carefully taken up, and each planted in a separate small pot filled with light sandy earth, and placed in a shady situation, giving them a little water to settle the earth to their roots; in this place they may remain about ten days, or a fortnight, by which time they will have taken good root, and may be removed to a sheltered place, where they may have more sun, in which they may remain till autumn: during the summer

months these may be watered two or three times a week, but it must not be given them in too great plenty; but as the sun declines in autumn, they should not have it so often; for if they are often supplied with it, the plants will grow luxuriant, their leaves and branches will be so replete with moisture, that the early frosts in the autumn will destroy them; whereas when they are kept dry, their growth will be stunted, so that they will be hardy enough to resist small frosts; but there must be care taken that they do not shoot their roots through the holes of the pots into the ground, for when they do the plants will grow very luxuriant; and when the pots are removed, and those roots are torn off, their leaves and branches will shrink, so will not recover it in a long time; to prevent which, the pots should be removed every month in summer, and where the roots are beginning to come through the pots, they should be cut off. The sorts which grow very freely, should be shifted three or four times in the summer, to pare off their roots, and keep them within compass; and these should never be planted in rich earth for the reasons before given, for if the earth is fresh, there will require no dung, or other compost, unless it is strong; in which case sea sand, or lime rubbish, will be a good mixture; the quantity of either must be in proportion to the stiffness of the ground, always being careful to render it so light, as that the wet may easily pass off.

We next proceed to treat of those sorts whose stalks and leaves are very succulent. The cuttings of these should be taken from the plants ten days or a fortnight before they are planted, that they may have time for their wounded part to heal over and dry; the lower leaves of these should also be stripped off, that their naked stalks may be of a sufficient length for planting. As these are mostly plants of humble growth, so if their stalks are divested of their leaves an inch and a half, it will be sufficient. The cuttings of these sorts require to be covered with glasses, to keep off the wet; they must also have less water than the other, but in other particulars will require the same treatment. The roots of these do not spread and extend so much as those of the other, so will not require to be shifted oftener than twice a year; they must also be kept in small pots, to confine their roots; the earth in which they are planted, should be rather light and not rich. During the summer season, they must not have too much wet, and in the winter they must have but little water. If these succulent sorts are placed in an open airy glass-case in winter, where they may have free air admitted to them in plenty in mild weather, and screened from the frost, they will thrive much better than when they are more tenderly treated.

The shrubby kinds may be sheltered in winter under a common frame, where, if they are protected from frost and wet, it is all they require; for the hardier these are treated, the greater quantity of flowers they will produce: some of the sorts are so hardy, as to live abroad when planted close to a good aspected wall, in a poor dry soil; so that where there is room to dispose them against a wall, and the border is raised with lime rubbish to prevent their rooting deep and growing luxuriant, they may be preserved through the winter with very little shelter, and these will flower much better than those under cover.

The first sort grows naturally in *Egypt*, where they cut up the plants, and burn them for pot-ash; and this is esteemed the best sort for making hard soap, and the best sort of glass.

This is an annual plant, which does not perfect seeds in *England*; for when it is placed in the stove, or kept in the hot-bed, their stalks grow long and slender, so are not productive of flowers; and those which are raised in hot beds, and afterward exposed in the open air, will flower pretty freely, but do not perfect their seeds. As this plant will

thrive in *South Carolina* as well as in its native soil, so it might turn to the advantage of that colony, and likewise become beneficial to the publick, if the inhabitants could be prevailed on to cultivate this plant.

The second sort is annual; it is propagated for the oddness of its leaves and stalks, which are closely covered over with pellucid pimples full of moisture, which when the sun shines on the plants, they reflect the light, and appear like small bubbles of ice; from whence some have called it the Ice Plant, and others have named it the Diamond Plant, or Diamond Ficoides.

This sort is propagated by seeds, which must be sown on a hot-bed early in the spring; and when the plants come up, they must be planted on a fresh hot-bed to bring them forward; after they have taken root in the hot-bed, they should have but little wet. When they are grown large enough to transplant again, they should be each planted into a small pot, filled with light fresh earth, and plunged into a hot-bed of tan, observing to shade them in the heat of the day until they have taken new root; then they should have plenty of fresh air admitted to them every day in warm weather, to prevent their drawing weak. In the latter end of *June*, some of the plants may be inured to bear the open air, and afterward they may be turned out of the pots, and planted into a warm border, where they will thrive and spread their branches to a great distance upon the ground; but these plants will not be very productive of flowers, therefore some of them must be continued in the small pots, and may at the same time, when the others are planted out, be removed into the stove or glass-case, placing them upon the shelves, that their roots may not get out from the bottom of the pots, so that they may be confined, which will cause them to flower plentifully, and from these good seeds may every year be obtained.

MESPILUS. *Tourn. Inst. R. H.* 641. *tab.* 410. The Medlar.

The Characters are,

The empalement of the flower is permanent. The flower is composed of five roundish concave petals, which are inserted in the empalement. The number of stamina are different in the several species, from ten to twenty or more; these are also inserted in the empalement. The germen is situated under the flower, and supports an uncertain number of styles from three to five; it afterward becomes a roundish or oval berry, carrying the empalement on its top, and inclosing four or five hard seeds.

The Species are,

1. MESPILUS *inermis, foliis lanceolatis dentatis acuminatis, subtus tomentosis, calycibus acuminatis.* Greater Medlar with a Bay tree leaf, and a smaller less substantial fruit.

2. MESPILUS *inermis, foliis lanceolatis integerrimis subtus tomentosis, calycibus acuminatis.* Hort. Cliff. 189. German Medlar, with a Bay tree leaf which is not sawed.

3. MESPILUS *inermis, foliis quinquefidis, subtus læviter villosis acutis.* Medlar with a cut Smallage leaf; commonly called L'Azarole.

4. MESPILUS *foliis obtusis bitrifidis serratis, ramis aculeatis.* Wild Medlar with a Smallage leaf and prickly branches; or common Hawthorn.

5. MESPILUS *inermis, foliis trilobatis obtusis glabris serratis, pedunculis trifloris.* Medlar with a cut Smallage leaf, and a yellowish white smaller fruit.

6. MESPILUS *spinosa, foliis lanceolato-ovatis crenatis, calycibus fructus obtusis.* Hort. Cliff. 189. Prickly Medlar, with spear-shaped, oval, crenated leaves; called Pyracantha.

7. MESPILUS *spinosa foliis ovatis acutis repando-angulatis serratis venosis.* Largest prickly Medlar of *Virginia*; called Cockspur Hawthorn.

8. MESPILUS *inermis foliis ovatis repando-angulatis serratis glabris.* Medlar without thorns, and oval, sawed, smooth leaves; commonly called Cockspur Haw without thorns.

9. MESPILUS *foliis lanceolato-ovatis crenatis glabris, ramis spinosis.* Medlar with spear-shaped, oval, crenated, smooth leaves and prickly branches; called *Virginia L'Azerole*.

10. MESPILUS *foliis lanceolatis serratis, spinis robustioribus, floribus corymbosis.* Fig. Pl. *tab.* 178. *fol.* 2. Medlar with spear-shaped sawed leaves, very strong spines, and flowers growing in round bunches.

11. MESPILUS *foliis cordato-ovatis acuminatis, acutè serratis, ramis spinosis.* Fig. Plant. *tab.* 179. Medlar with heart-shaped, oval, acute-pointed leaves, which are sharply sawed, and prickly branches.

12. MESPILUS *foliis oblongo-ovatis acuminatis, angulato-serratis glabris, ramis spinosis.* Medlar with oblong, oval, acute-pointed, smooth leaves, which are angularly sawed, and prickly branches; called Maple-leaved Hawthorn.

13. MESPILUS *foliis ovatis angulato-serratis glabris, ramis inermibus.* Medlar with oval smooth leaves which are angularly sawed, and smooth branches.

14. MESPILUS *inermis, foliis ovato-lanceolatis nervosis serratis subtus villosis.* Medlar without thorns, and oval, spear-shaped, veined, sawed leaves, which are hairy on their under side.

15. MESPILUS *foliis ovatis obtusis, supernè serratis, glabris, fructu ovato.* Medlar with oval, obtuse, smooth leaves, which are sawed toward their points, and an oval fruit; commonly called Pear-shaped Haw.

16. MESPILUS *inermis, foliis obverse ovatis, supernè denticulatis utrinque viridibus.* Medlar without spines, and obverse oval leaves, which are slightly indented toward their ends, and green on both sides.

17. MESPILUS *foliis lanceolato-ovatis serratis subtus villosis floribus solitariis, calycibus foliaceis, spinis longissimis tenuioribus.* Medlar with spear-shaped oval leaves which are sawed, and hairy on their under side, flowers growing singly with leafy empalements, and very long spines; commonly called Lord Islay's Haw.

18. MESPILUS *inermis, foliis ovalibus serratis, cauliculis hirsutis.* Lin. Sp. Plant. 478. Medlar without thorns, having oval sawed leaves, and hairy stalks; commonly called Ame-lanchier.

19. MESPILUS *foliis ovato-oblongis glabris serratis, caule inermi.* Lin. Sp. Plant. 478. Medlar with oval, oblong, smooth, sawed leaves, and branches without thorns.

20. MESPILUS *foliis ovatis integerrimis.* Hort. Cliff. 189. Medlar with oval entire leaves; commonly called Dwarf Quince.

21. MESPILUS *inermis, foliis ovalibus serratis glabris, floribus capitatis, bracteis deciduis linearibus.* Lin. Sp. Plant. 479. Medlar without thorns, having smooth, oval, sawed leaves, headed flowers, and linear bractæ which fall off.

22. MESPILUS *foliis ovatis crassis integerrimis, subtus tomentosis, floribus umbellatis axillaribus.* Medlar with oval, thick, entire leaves, which are woolly on their under side, and flowers growing in umbels from the wings of the stalk; or Dwarf Cherry of mount *Ida*.

The first sort grows naturally in *Sicily*, where it becomes a large tree. It rises with a straiter stem, and the branches grow more upright than those of the *Dutch Medlar*; the leaves are narrower and not sawn on their edges; the flowers are smaller than those of the *Dutch Medlar*; and the fruit is shaped like a Pear.

The second is generally called the *Dutch Medlar*; this never rises with an upright stalk, but sends out crooked deformed branches at a small height from the ground; the leaves of this are very large, entire, and downy on their under

under side. The flowers are very large, as are also the fruit, which are rounder, and approach nearer to the shape of an Apple. This being the largest fruit, is now generally cultivated in the gardens; but there is one with smaller fruit, which is called the *Nottingham Medlar*, of a much quicker and more poignant taste than this, which is supposed to be only a variety, so I have not enumerated it.

The third sort grows naturally in *Sicily*, and the islands of the *Archipelago*; of this there are several varieties, which differ in the form and size of their leaves, some being cut into five, others into six or seven lobes, which are sometimes sawed on their edges, and others are entire; some of them have oval large fruit, and others are smaller, rounder, and of different colours; some almost white, others yellow, and some are red. These fruit are cultivated for the table in most parts of *Italy*, where they are eaten in the autumn and winter, as the common Medlars are in *England*.

The fourth sort is the common Hawthorn, which is generally cultivated in *England* for fences to inclose fields, and is one of the best and most durable plants for that purpose, which we have in this country. There are several varieties of this, which differ in the size of their leaves, the manner in which they are cut, and the size and shape of their fruit; but those with the smallest leaves, are the best for close hedges, because their branches grow closer together.

There is also a variety of this with double flowers, which is an ornamental shrub for gardens, for which purpose it is propagated in the nurseries. The *Glastenbury Thorn* is also supposed to be only a variety of the common Hawthorn; but this was certainly brought to *England* from the east, for I have of late years raised many plants from Haws which came from *Aleppo*, and find them all prove to be what is here called *Glastenbury Thorn*; it differs from our common Hawthorn in putting out its leaves very early in the spring, and in flowering twice a year; for in mild seasons it often flowers in *November* and *December*, and again at the usual time with the common sort; but the stories which are told of its budding, blossoming, and fading, on *Christmas* day, are ridiculous, having no foundation.

These varieties are propagated by budding or grafting them on the common sort, especially the double flowering, which cannot be propagated any other way.

The fifth sort has much broader leaves than the common Hawthorn, which are divided into three obtuse lobes which are smooth, slightly sawed on their edges, and of a lucid green on their upper surface. The flowers are larger than those of the common sort, and each foot-stalk sustains three of them; the fruit is the shape and size of the common Haw, but is of a yellowish white colour; this came from *Italy*.

The sixth sort is most commonly known by the title of *Pyracantha*, or ever-green Hawthorn. This does not rise to a tree, for the stalk and branches are too slender and weak to stand without support, so the plants are generally planted against walls or buildings to cover them. It grows naturally in the hedges in the south of *France* and *Italy*. The flowers come from the side of the branches in large umbels, they are smaller than those of the common Hawthorn, and of a dirty white; these are succeeded by roundish umbilicated berries, of a fiery red colour, which ripen in the winter, and being intermixed with the ever-green leaves, make a fine appearance at that season of the year.

This is propagated by the seeds in the same manner as the common Hawthorn, or by laying down of the branches, which, if young, and laid in the autumn, will put out roots fit to remove in one year; but when the old wood is laid down, it seldom puts out roots in less than two or three years, if they ever do.

The seventh sort grows naturally in *North America*; this is called *Cockspur Hawthorn*, from the shape of its thorns, which are very strong, and bent downward like a cockspur. This hath a strong stem, which rises ten or twelve feet high, dividing into several branches, garnished with oval leaves, sawed on their edges, cut into acute angles, and of a light green on their upper side, but pale on their under. The flowers come out in large umbels, from the side, and at the extremity of the branches; they are much larger than those of the common Hawthorn, and have ten stamina in each, in the center there are five styles crowned by reflexed stigmas. The fruit are nearly as large as the common black Cherry, of a fine red colour when ripe, so make a good appearance at that season, as their flowers also do at the time when they appear. The fruit is good food for the deer, so it deserves to be propagated.

The eighth sort is very like the seventh, but the branches have no thorns on them; the leaves are a little deeper sawed on their edges, and not so deeply veined; this is a native of the same country, and grows to as large a size as the seventh.

The ninth sort is a native of *North America*, where it grows to be a tree of middling size. The young branches have a dark brown bark, and a few pretty strong thorns, which are thinly placed. The leaves are spear-shaped, of a lucid green, and indented on their edges. The flowers are as large as those of the former sorts, but the umbels are less; they have at least twenty stamina, terminated by small red summits, and but three styles, crowned by indented stigmas; the fruit of this is as large as that of the *Cockspur Hawthorn*, but a little oval-shaped, of a red colour, and ripens a little later in the year.

The tenth sort is also a native of *America*; it is of humbler growth than either of the three former; the branches have a dark brown smooth bark, and are armed with longer and stronger thorns than any of the other species. The branches shoot horizontally, and bend downward, so are often interwoven one in another; these are garnished with spear-shaped smooth leaves, sawed on their edges, of a lucid green. From the side of the branches come out flowers in roundish bunches; these have ten stamina in each flower; between these are situated three styles, crowned by obtuse stigmas; the fruit is large, roundish, and of a deep red colour when ripe. As this sort is armed with strong thorns, and the branches naturally intermix with each other, it will make one of the strongest fences, if properly managed, that can be planted.

The eleventh sort was raised in the *Chelsea* garden from seeds, which came from *North America*. This hath a strong stem about five feet high, covered with a rough bark, dividing into many spreading branches, which are armed with long slender thorns, and garnished with oval leaves, differing in their form, some being indented at their foot-stalks in form of a heart, and others are entire at that part; some of them end in very acute points, and others are obtuse; they are sharply sawed on their edges, of a light yellowish green on their upper side, and pale on their under, standing upon slender foot-stalks. The flowers come out in bunches from the side and at the end of the branches; they are about the size and shape of those of the common sort, having eight stamina in each; they have four styles in each, crowned by obtuse stigma; the fruit is of the same size, shape, and colour, as the common Hawthorn.

The twelfth sort was brought from *Virginia*, where it grows naturally. This rises to a tree of middling size, the branches are armed with a few slender thorns, and are garnished with oblong, oval, angular leaves, of a lucid green on their upper side, but pale on their under; some of the leaves are cut so deep on their sides, as almost to divide

them into lobes, but others are more entire. The flowers are produced in large umbels at the end of the branches, they are larger than those of the common Hawthorn, and have twenty stamina, and three short styles in each. The fruit are rather smaller than those of the common sort, and are of a very bright red colour, so make a fine appearance in the autumn, as the flowers do in summer; this sort is one of the latest in blossoming. The gardeners call it the Maple-leaved Haw.

The thirteenth sort grows naturally in *North America*; this rises to a middling height, with a pretty strong stem, dividing into many spreading branches, which have no thorns, but are garnished with oval leaves which are sharply sawed on their edges, and cut into many acute angles, of a light yellowish green, and smooth. The flowers come out at the end of the branches in close umbels, they are larger than those of the common sort, and have ten stamina and three styles in each. The fruit is larger than that of the common Hawthorn, and of the same colour.

The fourteenth sort was raised from seeds, which were brought from *North America*; this hath a strong upright stem, sending out many strong branches without thorns, which are garnished with oval spear-shaped leaves, sawed on their edges. The leaves run along the short foot-stalk to the bottom, like wings; they are of a dark green on their upper side, but pale and hairy on their under. The flowers come out in large umbels at the extremity of the branches; they have a great number of stamina in each, which are terminated by round red summits, and three styles crowned by obtuse stigmas. This sort flowers late in the summer, about the same time with the eleventh.

The fifteenth sort grows naturally in *North America*; this is a tree of middling growth. The branches are covered with a dark brown bark, and have no thorns, but are garnished with oval obtuse leaves, some of which are broad at the ends, others come more to a point; their upper parts are regularly sawed, and most of them draw to a point at the foot-stalk; they are of a yellowish green on both sides, and smooth. The flowers are produced in small bunches at the end of the branches, their empalements are cut into acute segments. The flowers are larger than those of the common sort, and have ten stamina in each, and five styles. The fruit is pretty large, almost shaped like an egg, and of an herbaceous yellow colour when ripe; it is by the gardeners called the Pear-shaped Haw.

The sixteenth sort is a native of *North America*; this is a tree of humble growth, seldom rising higher than the common Hawthorn. The branches are without spines, covered with a gray bark, and garnished with obverse oval leaves, which are rounded and sawed, some of the leaves being pointed, and others obtuse; they are of a bright green on both sides. The flowers are produced in large umbels at the end of the branches, and are about the size of those of the common sort; these have about twenty stamina, and five styles. The fruit is like that of the common Hawthorn.

The seventeenth sort was raised by his Grace the late Duke of *Argyle*, in his curious garden at *Whitton*, and is generally known by the title of Lord *Islay's* Hawthorn. The seeds of it were sent from *Virginia*, by Mr. *Banister*, and some of the plants were raised in the Bishop of *London's* garden at *Fulham* many years ago, which were afterward destroyed, with many other curious shrubs and trees: this is of humble growth, seldom rising more than six or seven feet high, sending out a great number of slender branches, armed with very long, slender, sharp thorns. The leaves are small, and sawed on their edges, with very short foot-stalks. The flowers are produced at the end of the branches, generally one coming out from between the leaves, but sometimes there are two or three, one below the other, at

the wings of the stalks; they have large leafy empalements, much longer than the petal. The flowers are small, sitting in the empalement; they have twelve or more stamina, and four styles in each. The fruit is smaller than that of the common Hawthorn, crowned by the leafy empalement, and is of an herbaceous yellow colour when ripe.

The eighteenth sort grows naturally in *Austria*, *Italy* and *France*, particularly near *Fontainebleau*; this rises with many slender stalks about three feet high, which put out small side branches, covered with a dark purple bark without thorns, which are closely garnished with oval leaves, slightly sawed on their edges; the small side branches which sustain the flowers, are very hairy and woolly, as are also the foot-stalks, and the under side of the leaves, but their upper sides are smooth and green. The flowers come out in bunches at the end of the shoots, which have five long narrow petals, and about ten stamina in each. These are succeeded by small fruit, which, when ripe, are black; the gardeners call this *New England Quince*; there is one of this kind which grows naturally in *North America*, but the leaves of that are wedge-shaped, and not sawed on the edges, so I take it to be a different species.

The nineteenth sort grows naturally in *Canada*; this is also a low shrub, seldom rising more than five feet high, dividing into several smooth branches, covered with a purplish bark. The leaves grow upon long slender foot-stalks; they are smooth on both sides, and a little sawed on their edges. The flowers come out in small bunches at the end of the branches; they are about the size of those of the common Hawthorn, and are succeeded by small fruit of a purplish colour when ripe.

The twentieth sort grows naturally on the *Pyrenean* mountains, and in other cold parts of *Europe*; this rises with a smooth shrubby stalk about four feet high, dividing into a few small branches, covered with a purple bark, garnished with oval intire leaves, with very short foot-stalks. The flowers come out from the side of the stalks, two or three together; they are small, of a purplish colour, and sit close to the stalks; these appear in *May*, and are succeeded by small roundish fruit, which are of a bright red colour when ripe.

The twenty-first sort grows naturally in the northern parts of *Europe*; this hath a smooth stalk, rising about four or five feet high, sending out slender branches, which are covered with a purplish bark, garnished with oval smooth leaves, sawed on their edges, with the teeth pointing upward; they have pretty long slender foot-stalks, and are of a yellowish green on both sides. The flowers come out from the wings of the stalk, four or five joined together in a close head, of a purplish colour; between the flowers come out long narrow bractea, which are purplish, and fall off as the flowers begin to decay. The fruit is small, and red when ripe.

The twenty-second sort grows naturally upon mount *Ida*, in *Crete*, where the poor shepherds feed upon the fruit when ripe; this hath a smooth stalk, covered with a brown bark, and rises eight or ten feet high, dividing into many smooth branches, which are garnished with oval leaves, two inches and a half long, and near two inches broad; of a thick substance, and a dark green on their upper side, but downy on their under, standing up short foot-stalks. The flowers come out from the side of the stalk; they are of a purple colour, the petals being but little longer than the empalement, which is woolly, and cut into five obtuse segments. The fruit is large, roundish, and of a fine red colour when ripe.

All these sorts are hardy enough to thrive in the open air in *England*, and several of them are very ornamental plants for gardens; and all the larger growing kinds are as proper for parks, where, during the season of their flowering, they will make a fine appearance; and again in autumn, when their

their fruit are ripe, they will afford an agreeable variety, and their fruit will be food for the deer and birds, so that if clumps of each sort are planted in different parts of the park, nothing can be more ornamental.

All the *American* kinds are usually propagated in the nurseries, by grafting or budding them upon the common White Thorn, but the plants so propagated will never grow to half the size of those which are propagated by seeds, so that where they are designed for parks and large plantations, those plants should always be chosen which have not been grafted or budded, but are upon their own roots, for several of the *American* sorts naturally grow twenty feet high, if they are not stunted by grafting; so that those sorts when grafted are only fit to intermix with shrubs for gardens, where they are not designed to grow large.

But there are many who object to this method of raising the plants from seeds, on account of their seeds not growing the first year, as also from the tediousness of the plants growth after; but where a person can furnish himself with the fruit in autumn, and take out their seeds soon after they are ripe, putting them into the ground immediately, the plants will come up the following spring; and if they are kept clean from weeds, and in very dry weather supplied with water, they will make great progress; but if these are planted in the places where they are to remain, after two years growth from seeds, they will succeed much better, than when the plants are of a greater age; but if they are planted in clumps in parks, the ground should be well trenched, and cleansed from the roots of all bad weeds; the places must also be securely fenced, otherwise the cattle will soon destroy them. The best time to transplant them is in autumn, when their leaves fall off; these should be constantly kept clean from weeds, and if the ground between the plants is dug every winter for the first seven years, it will encourage their growth, and by that time the plants will have made such progress, as to be strong enough to encounter and keep down the weeds, so that if they are cut twice in the summer, it will be sufficient; but the inclosure must not be taken away, till the stems are so large, and their bark so rough, as that the cattle will not eat it; their stems should also be trained up so high, as that their branches may be out of the reach of cattle, otherwise they will crop them, especially those which have no thorns.

If when these clumps are planted, the ground be inclosed with an Oak pale, in the same manner as that round parks, the fence will last as long as the trees will require any protection; but these pales should not be quite close, for if they are placed so near each other at bottom as to keep out hares, it will be sufficient; and upward, if they are not so close, there will be more air admitted to the plants, which will be of service to them, so that such pales may be chosen for these purposes, which are broader at one end than the other, and the broadest ends turned downward. The plants in these clumps need not be planted at a greater distance from each other than six feet, for by being so near together, they will draw one another up taller, than where they have more room to spread.

The sort with double flowers, can be no other way propagated than by grafting, or budding it upon the other sorts, so that where this sort is desired to grow large, it should be grafted or budded upon stocks of the Cockspur, or other large growing kind, upon which this will grow to a much larger size than upon the common White Thorn; or if they are budded upon the *Aria Theophrasti*, which grows to a large size, they will also be much improved.

All the sorts of *Mespilus* and *Cratægus* will take by budding or grafting upon each other; they will also take upon the Quince, or Pear stocks, and both these will take upon

the Medlars, so that these have great affinity with each other, and might be with more propriety brought together under the same genus, than the Pear and Apple, which will not take upon each other; but although the Pear will take upon the White Thorn, yet it is not advisable to make use of these stocks, because they generally cause the fruit to be small, and often to crack, and renders their flesh stony, so unless it is the very soft melting kinds of Pears which are upon these stocks, the fruit will not be good.

The common Hawthorn is usually propagated for fences; the best plants for this purpose, are those which are raised from seeds, and the younger these are planted, the better they will succeed; and where people have patience to raise their hedges from seeds in the places where they are to remain, the plants will be stronger, and of longer duration, than those which are transplanted; but there are few who have patience to practise this method. When the seeds of this sort are sown, it is the usual way to bury the Haws in the ground one year, and then take them up and sow them, because when the Haws are sown without being thus prepared, they do not grow the first year; but where persons are in haste to raise the plants, if they get the Haws as soon as they are ripe, and put them into a tub, or pot, and bury them in a heap of hot dung for a month or six weeks, in which time they will ferment, and the skin and pulp will rot; then take them out, and macerate them in water, to separate the seeds, and sow them immediately after, the plants will come up the first year, as I have experienced, and hereby a year will be saved. The after management of these plants, with the method of transplanting them, and training them up, having been already fully treated of under the article of HEDGES, I shall not repeat it here.

The five last mentioned sorts being plants of humble growth, are only proper for gardens, so are generally intermixed with other flowering shrubs to add to the variety; these are frequently propagated in the nurseries, by budding or grafting them upon the stocks of the White Thorn; but as the buds or grafts of these sorts do not keep pace in their growth with the stocks, so after a few years they will appear very unsightly, and many times they are blown out of the stocks, when the heads are grown so large as to stop the wind in its course, and thereby the plants are destroyed; so that these sorts should always be propagated by seeds, or by laying down of the young branches, which will take root in one year, when they are carefully laid, and sometimes the cuttings of these will take root, if they are planted in autumn, in a loamy soil; and these plants upon their own roots, will always thrive better, and continue longer, than those which are upon other stocks. The method of propagating these by seeds being the same as for the other species, it need not be repeated.

METHONICA. See *Gloriosa*.

MEUM. See *Athamanta*.

MEZEREON. See *Thymelæa*.

MICROPUS. *Lin. Gen. Plant.* 892. Bastard Cudweed.

The Characters are,

It hath hermaphrodite and female flowers, which are included in the same naked empalement. The female flowers are hid under the scales of the interior empalement, which have each a single oval seed succeeding them, included in the small leaves of the empalement, but have no down about them.

We have but one Species of this genus, viz.

MICROPUS. *Hort. Upsal.* 275. *Prod. Leyd.* 145. Portugal Bastard Cudweed.

This is an annual plant, which grows naturally in Portugal, near the sea. The root sends out several trailing stalks, about six or eight inches long, which are garnished with

with small, oval, silvery leaves, whose base embrace the stalks. The flowers come out from the wings of the stalks in small clusters; they are very small, white, and sit in a double empalement, the interior being so large, as to almost hide the flowers. It flowers in *June* and *July*, and the seeds ripen in autumn; this is frequently preserved in gardens, for the beauty of its silvery leaves; if the seeds are sown in autumn, or are permitted to scatter, the plants will come up in the spring, and will require no other care but to keep them clean from weeds, and thin them where they are too close. When the seeds of this plant are sown in the spring, they seldom grow the first year.

MILIUM. *Tourn. Inst. R. H.* 514. *tab.* 298. *Lin. Gen. Plant.* 73. Millet.

The Characters are,

It is of the *Corn; or Grass* tribe, with one flower in each chaff. The petal of the flower is bivalve, and smaller than the empalement. It hath three very short hairy stamina, and a roundish germen with two hairy styles. The germen afterward turns to a roundish seed, covered by the petal of the flower.

The Species are,

1. MILIUM paniculâ laxâ flaccidâ, foliorum vaginis pubescentibus. Millet with a loose hanging panicle, and the sheaths of the leaves hairy; Millet with a yellow seed.

2. MILIUM paniculâ sparsâ erectâ, glumis aristatis. Millet with a loose erect panicle, and bearded chaff.

The first sort grows naturally in *India*, but is now cultivated in many parts of *Europe*, as an esculent grain; this rises with a Reed-like stalk, three or four feet high, channelled; at every joint there is one Reed-like leaf, which is joined on the top of the sheath, which embraces and covers that joint of the stalk below the leaf; this sheath is closely covered with soft hairs, but the leaf which is expanded has none. The top of the stalk is terminated by a large loose panicle, which hangs on one side, having a chaffy flower, which is succeeded by a small round seed, which is often made into puddings, &c. There are two varieties of this, one with white, and the other hath black seeds, but do not differ in any other particular.

The second sort was discovered growing naturally at *La Vera Cruz*; this has a slender stalk than the former, which rises about three feet high. The sheaths which surround it have no hairs, but are channelled. The leaves are shorter than those of the former. The panicle stands erect, and the chaff has shorter awns, or beards.

The common Millet was originally brought from the eastern countries, where it is still greatly cultivated, from whence we are furnished annually with this grain, which is by many persons greatly esteemed for puddings, &c. This is seldom cultivated in *England*, but by way of curiosity in small gardens, or for feeding of poultry, where the seeds generally ripen very well.

They must be sown the beginning of *April*, upon a warm dry soil, but not too thick, because these plants divide into several branches, and should have much room; and when they come up, they should be cleared from weeds, after which they will, in a short time, get the better of them, and prevent their future growth. In *August* these seeds will ripen, when it must be cut down and beaten out, as is practised for other grain; but when it begins to ripen, if it be not protected from birds, they will soon devour it.

MILLEFOLIUM. See *Achillea*.

MILLERIA. *Houss. Gen. Nov. Martyn. Cent.* 4. *Lin. Gen. Plant.* 881.

The Characters are,

This hath a compound flower, included in a naked empalement, cut into three parts, and is permanent. It hath a large three-cornered germen, without down. The germen afterward turns to an oblong, three-cornered, obtuse seed, inclosed in the empalement.

The Species are,

1. MILLERIA foliis cordatis, pedunculis dichotomis. *Hort. Cliff.* 426. *Milleria* with heart-shaped leaves, and foot-stalks arising from the division of the stalks.

2. MILLERIA foliis infimis cordato-ovatis acutis rugosis, caulibus lanceolato-ovatis, acuminatis. *Milleria* whose lower leaves are oval, heart-shaped, acute-pointed, and rough, and the upper ones oval, spear-shaped, and pointed.

3. MILLERIA foliis ovatis, pedunculis simplicissimis. *Hort. Cliff.* 425. *Milleria* with oval leaves, and single foot-stalks.

4. MILLERIA foliis ovato-lanceolatis acuminatis trinerviis, pedunculis alaribus. *Milleria* with oval, spear-shaped, acute-pointed leaves, having three veins, and foot-stalks proceeding from the wings of the leaves.

5. MILLERIA foliis lanceolatis rugosis, floribus confertis axillaribus. *Milleria* with rough spear-shaped leaves, and flowers growing in clusters from the wings of the stalks.

The first sort was discovered by the late *Dr. William Housloun*, at *Campeachy*, in the year 1731, who sent the seeds to *Europe*; and as the characters which distinguish this genus, are different from all the other genera of the class to which it belongs, so he constituted a new genus with this title.

This rises with an herbaceous branching stalk, from three to four or five feet high, garnished with large heart-shaped leaves, slightly sawed on their edges, having two veins on each side the midrib, which join to it near the base, but diverge from it toward the borders of the leaves. The leaves are of a light green, hairy, and stand opposite; their foot-stalks are about an inch long, and have a part of the leaf running on each side, like wings. The stalks divide by pairs upward, and the foot-stalks of the flowers come out at the divisions; these branch again by pairs, and terminate in loose spikes of yellow flowers, composed of four or five hermaphrodite florets, which are barren, and one female half floret, which is succeeded by a single, oblong, angular seed, wrapped in the empalement of the flower. It flowers in *July* and *August*, and the seeds ripen in autumn.

The second sort was discovered by *Mr. Robert Millar*, at *Campeachy*, in the year 1734; this approaches near to the first sort, but the stalks rise six or seven feet high, and branch out very wide. The leaves are seven inches long, and four inches and a half broad toward their base, ending in long acute points; they are deeper sawed on their edges, and have several large black spots scattered over them; their surface is rougher, and they are of a darker green than those of the first. The upper leaves are long, and spear-shaped; the foot-stalks of the flowers branch out wider, and the spikes of flowers are shorter than those of the first.

The third sort was discovered at *Campeachy*, by the late *Dr. Housloun*; this is an annual plant, which rises with an herbaceous stalk about two feet high, branching out at a small distance from the root, into three or four slender stalks, which are naked almost to the top, where they have two oval spear-shaped leaves, placed opposite, which are about two inches long, and three quarters of an inch broad near their base, ending in points; they are hairy, and stand upon naked foot-stalks, having three longitudinal veins, and are slightly indented on their edges. The flowers come out at the foot stalks of the leaves, in small clusters; the common empalement is composed of three orbicular leaves, which are compressed together; in each of these are situated two or three hermaphrodite florets, which are barren, and one female half floret, which is fruitful, being succeeded by a roundish angular seed, inclosed in the empalement. This flowers and perfects seeds about the same time with the former.

The fourth sort was discovered by the late Mr. Robert Millar at *Campeachy*. This is an annual plant, which rises with an upright stalk three or four feet high, garnished the whole length with oval spear-shaped leaves near four inches long, and almost two broad near their base; they have three longitudinal veins, and toward the top there are two more which diverge from the midrib, but join again at the point. The upper side of the leaves are of a dark green and smooth, their under are of a pale green, and indented on their edges. The flowers grow from the wings of the leaves in small clusters, standing upon short foot-stalks; these have empalements like the former, but are much smaller, in each of which are situated two hermaphrodite florets which are barren, and one female half floret which is fruitful. This flowers and seeds later in the year than either of the former, so that unless the plants are brought forward in the spring, they will not ripen their seeds in *England*.

The fifth sort was discovered by the late Mr. Robert Millar at *Campeachy*. This rises with a pretty strong channelled stalk near four feet high, divided into branches by pairs; these are garnished with spear-shaped leaves about three inches long and one broad in the middle, ending in acute points; they are rough, and their edges are entire. The flowers come out at every joint the whole length of the branches, in very close clusters, each containing upward of twenty, so that the branches are almost covered with them; they have orbicular compressed empalements, which have borders to them, and are smaller than those of either of the two former. Their leaves are equal, and in each of the empalements are situated two hermaphrodite florets which are barren, and one half floret which is female and fruitful. This is also late in flowering, so that unless the plants are brought forward early in the spring, they will not ripen seeds in *England*.

The seeds of these plants should be sown early in the spring, on a moderate hot-bed; and when the plants are come up about two inches, they should be each transplanted into a separate pot, filled with light rich earth, and then plunged into a moderate hot-bed of tanners bark, being careful to shade them from the sun until they have taken root, as also to water them frequently. After the plants are rooted, they should have a large share of free air admitted to them; they must also be constantly watered every day in hot weather, for they are very thirsty plants. With this management the plants will, in a month after transplanting, rise to a considerable height; therefore they should be shifted into larger pots, and placed in the stove, plunging them into the bark-bed, where they may have room to grow, especially the first and second sorts, which usually grow high and branch out, where they are well managed. But the other sorts seldom rise above three or four feet high, and do not spread their branches very far, so these may be allowed less room.

In the middle of *July* these plants will begin to flower, and the seeds will be ripe about a month after; therefore they must be gathered when they begin to change of a dark brown colour, otherwise they will soon fall off, especially those of the two large kinds, which will drop on the least touch when they are ripe. These plants will continue flowering till *Michaelmas*, or later, if the season proves favourable; but when the cold of the autumn comes on, they will soon decay.

MIMOSA. *Tourn. Inst. R. H. 605. tab. 375. Lin. Gen. Plant. 597.* The Sensitive Plant.

The Characters are,

The empalement of the flower is small, indented in five parts at the top: the flowers are male and hermaphrodite, included in each head; the male flowers have ten, but the other have

seldom more than five. These have long hairy stamina, a short slender style, crowned by a truncated stigma. The germen afterward turns to a jointed pod with several transverse partitions, inclosing compressed roundish seeds.

The Species are,

1. MIMOSA *inermis, foliis bipinnatis, spicis cernuis, floribus decandris, inferioribus castratis apetalis. Flor. Zeyl. 505.* Smooth Sensitive Plant, with double winged leaves, nodding spikes of flowers, having ten stamina, and the lower without either stamina or petals; or the Sensitive Plant of *Jamaica*.

2. MIMOSA *inermis, foliis bipinnatis, spicarum floribus pentandris, inferioribus plenis. Hort. Upsal. 145.* Smooth Sensitive Plant with double winged leaves, the flowers of the spikes with five stamina, and the under ones double.

3. MIMOSA *inermis decumbens, foliis bipinnatis, spicis cernuis, floribus pentandris, inferioribus castratis. Hort. Upsal. 145.* Smooth Sensitive Plant with inclining stalks, double winged leaves, nodding spikes of flowers having five stamina, but the under ones without any; Spurious Sensitive Plant.

4. MIMOSA *aculeata, foliis pinnatis, caule procumbente villoso, siliquis articulatis.* Prickly Sensitive Plant with winged leaves, a hairy trailing stalk, and jointed pods.

5. MIMOSA *foliis subdigitatis pinnatis, caule aculeato hispido. Lin. Sp. Plant. 518.* Sensitive Plant with winged handed leaves, and a prickly hairy stalk.

6. MIMOSA *foliis subdigitatis pinnatis, caule aculeato decumbente, siliquis confertis, involucris hispidis.* Sensitive Plant with winged handed leaves, a prickly declining stalk, and small pods growing in clusters, with prickly coverings.

7. MIMOSA *aculeata, foliis bipinnatis, caule quadrangulo, aculeis recurvis, leguminibus quadrivalvibus. Lin. Sp. Plant. 522.* Prickly Sensitive Plant with double winged leaves, a four-cornered stalk, recurved spines, and pods having four valves.

8. MIMOSA *foliis conjugatis pinnatis, partialibus bijugis, intimis minimis, caule aculeato. Lin. Sp. Plant. 518.* Sensitive Plant with conjugated winged leaves, whose wings have two pair of lobes, the inner of which are the least, and a prickly stalk.

9. MIMOSA *caule fruticoso, foliis bipinnatis, aculeatis, aculeis geminis, siliquis radiatis hirsutis. Fig. Plant. tab. 183. fol. 3.* Sensitive Plant with a shrubby stalk, double winged prickly leaves, whose spines grow in pairs, and hairy radiated pods.

10. MIMOSA *caule inermi herbaceo repente, foliis conjugatis pinnatis, floribus globosis alaribus.* Sensitive Plant with a creeping, herbaceous, unarmed stalk, conjugated winged leaves, and globular flowers proceeding from the wings of the stalks.

The first sort grows naturally in most of the islands in the *West-Indies*; it has also been found growing in some warm moist spots, as far north as *Virginia*. This rises with upright branching stalks six or seven feet high, which become ligneous toward the root, but are not perennial (at least they are not so here in any situation, the plants always decaying in winter;) these are smooth, and garnished with double winged leaves, composed of four or five pair of long winged lobes, which have about twenty pair of small leaves ranged along the midrib; they are smooth, and rounded at their points, of a full green on their upper side, but pale on their under. These small leaves contract themselves together on their being touched, but the foot-stalks do not decline at the same time as those do which are titled Humble Plants; therefore this is called the Sensitive Plant simply, by way of distinction. The flowers are produced upon long foot-stalks, which come out from the wings of the leaves, and are disposed in globular heads which nod downward; they are yellow, and all those which are hermaphrodite have tubulous petals, with ten stamina in each, but

but the female flowers, situated round the border, have neither petals or stamina; the hermaphrodite flowers are succeeded by pods an inch and a half long, and a quarter of an inch broad, which change to a dark brown when ripe, inclosing three or four compressed, shining, black seeds.

The second sort was discovered by the late Dr. *Houftoun* at *La Vera Cruz*, growing in stagnant waters, where the stalks were very broad and flat, and floated on the surface, in the same way as the pond weeds do; but in those places where the water was dried up, the stalks grew upright and were round, which is always the case when the plants are cultivated in gardens, so that they might easily pass for different plants, to those who never saw them growing in both situations. When this sort is cultivated in gardens, it has great resemblance to the first, but the stalks of this never grow so erect, the wings of the leaves are longer, and stand more horizontal; the heads of flowers are much larger, the stamina are longer, and the flowers on the under side of the spike, which have no stamina, are double: the pods of this sort are shorter, and much broader than those of the first sort. This is also an annual plant in this country. It was since discovered by a friend of mine, growing naturally in a marshy spot of land in the island of *Barbuda*, from whence he sent me the seeds, with a large branch of the plant in a glass filled with a lixivium, which preserved it in the state it was gathered, with the flowers and pods upon it.

The third sort grows naturally in all the islands of the *West-Indies*, where it is titled the Slothful Sensitive Plant, because the leaves do not contract on their being touched. The stalks of this sort seldom rise more than two feet and a half high; they are smooth, and garnished with double-winged leaves, which are shorter, and the small leaves are much narrower than those of the two former sorts; the heads of flowers are smaller, and the pods are longer and narrower than those of the other. This sort will live through the winter in a moderate warm air.

The fourth sort was discovered by the late Dr. *Houftoun*, growing naturally at *La Vera Cruz*. This hath ligneous stalks, which decline to the ground, and send out several side branches, which are armed with short yellowish spines under the foot-stalks of the leaves, and are their whole length closely covered with bristly stinging hairs. It hath single winged leaves, whose base meet in a point, but spread above like the fingers of an open hand, closely garnished with small narrow lobes, set by pairs along the midrib. The flowers come out from the wings of the leaves upon pretty long foot-stalks; they are collected into globular heads, and are of a pale yellowish colour; these are succeeded by small jointed pods, containing two or three shining black seeds.

The fifth sort grows naturally at *Campeachy*. This hath ligneous declining stalks, which are armed with thorns, and covered with stinging bristly hairs; the leaves are composed of four wings, which join at their base, where they are inserted to the foot-stalk, spreading out like the fingers of an open hand: these wings are much shorter than those of the former, and the small leaves or lobes are broader. The flowers come out from the wings of the stalk upon long foot stalks, growing in oval heads; they are white, and are succeeded by small prickly pods. This is one of those species whose foot-stalks fall upon being touched.

The sixth sort is the most common of any in the islands of the *West-Indies*, as also in the *English* gardens; the seeds of this sort are frequently sold in the seed-shops, by the title of Humble Plant. The roots of this are composed of a great number of hairy fibres, which mat close together, from which come out several ligneous stalks, which naturally decline toward the ground, unless they are supported;

they are armed with short recurved spines, and garnished with winged leaves, composed of four, and sometimes five wings, whose base join at a point, where they are inserted to the foot-stalk, spreading upward like the fingers of a hand: these wings are shorter than those of the former sort, and the stalks are not hairy. The flowers come out from the wings of the stalks upon short foot-stalks; they are collected in small globular heads, are yellow, and are succeeded by short, flat, jointed pods, which have two or three orbicular, bordered, compressed seeds in each: these pods are in close clusters, almost covered with stinging hairy covers.

The seventh sort grows naturally at *La Vera Cruz*. This hath a perennial creeping root, which spreads and multiplies greatly in the sands, where it grows wild; the stalks are slender, and have four acute angles, armed with short recurved spines pretty closely; the leaves stand upon long prickly foot-stalks, which are thinly placed on the branches; they are composed of two pair of wings, standing about an inch asunder; the wings are short, and the small leaves are narrow, and not placed so close together, as in many of the other species. The foot-stalks of the flowers come out from the wings of the leaves, sustaining a small globular head of purple flowers; these are succeeded by four-cornered pods about two inches long, which have four cells; opening with four valves, containing several angular seeds in each.

This sort spreads so much at the root, as to render it not so productive of flowers and seeds, as most of the others; and the plants which are propagated by parting of the roots, are always weak, so that the best way is to propagate them by seeds, when they can be obtained. This is one of the sorts, whose foot-stalks fall on being touched.

The eighth sort grows naturally at *La Vera Cruz*. This rises with a slender ligneous stalk seven or eight feet high, armed with short recurved thorns. The leaves grow upon long foot-stalks which are prickly, each sustaining two pair of wings; the exterior pair have two lobes, which join at their base, and are rounded on their outside, but strait on their inner edges, very much shaped like a pair of those shears, used for shearing of sheep; these two outer pair of lobes are much larger than the inner. From the place where these are inserted to the stalk, come out small branches, which have three or four globular heads of pale purple flowers upon short foot-stalks, and the principal stalk has many of these heads of flowers on the upper part for more than a foot in length; and this, as also the branches, are terminated by the like heads of flowers, which are succeeded by broad, flat, jointed pods, which open with two valves, some having but one, others two, and some have three orbicular compressed seeds. The leaves of this sort move but slowly when they are touched, but the foot-stalks fall when they are pressed pretty hard.

The ninth sort was also found growing naturally at *La Vera Cruz*. This hath a shrubby erect stalk about five feet high, which is hairy, and armed with short, broad, strong, white thorns, standing on each side almost opposite, and at others alternately. The leaves are composed of five or six pair of wings, which are ranged opposite along a strong midrib, and between each pair are placed two short strong spines, pointing out each way. The small leaves which compose these wings are extremely narrow, and stand very close to each other. Toward the upper part of the stalk, the flowers are produced from the sides upon short foot-stalks; they are collected into globular heads, and are of a bright purple colour; the stalks are also terminated by smaller heads of the like flowers. These are succeeded by flat jointed pods about two inches long, and a quarter of an inch broad, which spread open like rays, there being commonly five or six of these joined together.

ther at their base to the foot-stalk. These pods separate at each articulation, leaving the two side membranes or borders standing, and the seeds which are compressed and square, drop out from the joints of the pods; these pods are hairy at first, but as they ripen become smooth.

This is a perennial plant, which may be preserved through the winter in a warm stove, by which method the seeds may be obtained, for they seldom flower the first year. The foot-stalks of this sort do not fall on being touched, but the small leaves on the wings close up.

The tenth sort grows naturally in *Jamaica*. This hath trailing herbaceous stalks, which put out roots at every joint, which fasten in the ground and spread to a great distance, as they will also do here, when placed in a bed of tanners bark. I have had a single plant in one summer, which has spread near three feet square, whose branches were closely joined, so as to cover the surface of the bed; but when they are thus permitted to grow, they seldom produce flowers. These stalks have no thorns, but are garnished with winged leaves, composed of two pair of short wings, whose small leaves or lobes are narrow; these stand upon short foot-stalks, which are smooth. The leaves of this sort contract and fall down upon the least touch, so that where the plant is extended to a distance, a person may draw any figure with a stick upon the leaves, which will be very visible till the leaves recover again. The flowers come out from the wings of the leaves, upon naked foot-stalks about an inch in length; they are of a pale yellowish colour, and are collected into small globular heads; these are succeeded by short, flat, jointed pods, containing three or four compressed roundish seeds.

These plants are all of them propagated by seeds, which should be sown early in the spring, upon a good hot-bed. If the seeds are good, the plants will appear in a fortnight or three weeks, when they will require to be treated with care, for they must not have much wet till they have acquired strength; nor should they be drawn too weak, so that fresh air should be admitted to them, at all times when the weather is temperate. In about a fortnight or three weeks after the plants come up, they will be fit to transplant, especially if the bed, in which they were sown, continues in a proper degree of heat; then there should be a fresh hot-bed prepared to receive them, which should be made a week before the plants are removed into it, that the violent heat may be abated before the earth is laid upon the dung, and the earth should have time to warm before the plants are planted into it. Then the plants must be carefully raised up from the bed to preserve the roots entire, and immediately planted in the new bed, at about three or four inches distance, pressing the earth gently to their roots; then they should be gently sprinkled over with water to settle the earth to their roots; after this they must be shaded from the sun till they have taken new root, and the glasses of the hot-bed should be covered every night, to keep up the heat of the bed. When the plants are established in their new bed, they must have frequent but gentle waterings; and every day they must have free air admitted to them, in proportion to the warmth of the season, to prevent their being drawn up weak; but they must be constantly kept in a moderate degree of heat, otherwise they will not thrive. In about a month after the plants will be strong enough to remove again, when they should be carefully taken up, preserving as much earth to their roots as possible, and each planted in a separate small pot, filled with good kitchen-garden earth, and plunged into a hot-bed of tan, carefully shading them from the sun till they have taken new root, then they must be treated in the same manner as other tender exotick plants from very warm countries.

The sorts which grow upright and tall, will soon rise high enough to reach the glasses of the hot-bed, especially if they thrive well; therefore they should be shifted into larger pots, and removed into the stove, and if they are plunged into the tan-bed there, it will greatly forward them. The first sort will often flower here, if the plants are raised early in the spring, and brought forward by their removal from one hot-bed to another, and two or three times I have had their seeds ripen, but this can only be expected in very warm seasons.

The perennial sorts will live through the winter, if they are preserved in a warm stove, and the following summer they will produce flowers and ripen their seeds. Some of these may be propagated by laying down their branches, which will put out roots, and then may be separated from the old plants; and I have sometimes propagated them by cuttings, but the plants which rise from seeds are preferable to either of these.

There is no particular management which these plants require, different from others of the same warm countries; the great care must be to keep them in a proper temperature of heat, and not to give them too much water, especially in cool weather; nor should they be kept too dry, for many of the sorts require frequent waterings, as they naturally grow in moist places. There should also be care taken that they do not root into the tan-bed, for they soon put out their roots through the holes at the bottom of the pots, which, when they strike into the tan, will cause the plants to grow very luxuriant; but when they are removed, and these roots are cut or broken off, the plants seldom survive it; therefore the pots should be frequently drawn out of the tan, and if any of the roots are beginning to get through the holes at bottom, they should be cut off close, to prevent their getting into the tan.

Some of those sorts, whose stalks spread near the ground, may be turned out of the pots in the middle or latter end of *June*, and planted in a very warm border, where, if they are covered with bell or hand-glasses, they will live through the summer; but these will not grow very large, and upon the approach of cold in autumn, they are soon destroyed; however, those who have not conveniency of stoves or tan-beds, may raise the plants on common hot-beds in the spring; and when they have acquired strength, they may be treated in this manner, whereby they will have the pleasure of these plants in summer, though not in so great perfection, as those which have the advantages before-mentioned: but when these plants are exposed to the open air in this country, they will not retain their sensibility on being touched.

It is not the light which causes them to expand, as some have affirmed, who have had no experience of these things; for in the longest days of summer, they are generally contracted by five or six in the evening, when the sun remains above the horizon two or three hours longer; and although the glasses of the stove, in which they are placed, is covered close with shutters to exclude the light in the middle of the day, yet if the air of the stove is warm, the leaves of the plants will continue fully expanded, as I have several times observed. Nor do these plants continue shut till the sun rises in the morning, for I have frequently found their leaves fully expanded by the break of day in the morning; so that it is plain the light is not the cause of their expansion, nor the want of it that of their contraction.

I have also observed, that those plants which are placed in the greatest warmth in winter, continue vigorous, and retain their faculty of contracting on being touched; but those which are in a moderate warmth, have little or no motion.

Some of the sorts are so susceptible of the touch, that the smallest drop of water falling on their leaves will cause them to contract, but others do not move without a much greater pressure.

The roots of all the sorts have a very strong disagreeable odour, almost like that of a common sewer. I have met with some accounts of these plants, in which it is mentioned, that the leaves and branches have a poisonous quality; and that the *Indians* extract a poison from them, which kills by slow degrees, and that the root of the plant is the only remedy to expel it; but how far this is true I cannot say, having never made any experiments on the qualities of these plants; but if these plants are endued with so deadly a quality as related, this sensibility in which they are endued, may be designed by Providence, to caution persons from being too free with it; and as many of them are strongly armed with thorns, so that is a guard against their being eaten by animals; for in all the enquiries which I have made of those persons who have resided in the countries where they naturally grow, I could never learn that any animal will browse upon them.

These plants are all of them natives of *America*, so were unknown to the other parts of the world till that was discovered, for I have not heard of any of them being found in any other country; and a few years ago I sent some of the seeds of these plants to *China*, which succeeded, and occasioned great admiration in all who saw the plants.

MIMULUS. *Lin. Gen. Plant.* 701. *Cynophyneium. Mitch.* 3.

The Characters are,

The flower hath an oblong permanent empalement; it is of the lip or rigent kind, whose brim is divided into two lips. The upper lip is erect, divided at the top in two parts; the lower lip is broad and trifid, the middle segment is the least; the palate is convex and bifid. It has four slender stamina, two longer than the other, and a conical germen, which afterward turns to an oval capsule with two cells, filled with small seeds.

We have but one Species of this genus, viz.

MIMULUS. *Hort. Upsal.* 176. *tab.* 2.

This plant grows naturally in *North America*, in moist ground. It has a perennial root, and an annual stalk, which is square, and rises a foot and a half high, garnished at each joint with two oblong smooth leaves. The lower part of the stalk sends out two or three short branches, and the upper part is adorned with two flowers at each joint, coming from the bosom of the leaves on each side the stalk; these have an oblong curved empalement with five angles, indented at the top in five parts, out of which arises the flower, with a long curved tube, spreading open at the top into two lips; the upper lip standing erect, which is slightly cut into two parts at the top; the under lip turns downward, and is cut into three slight segments. The flowers are of a Violet colour, but have no scent. These appear in *July*, and are succeeded by oblong capsules with two cells, filled with small seeds which ripen in the autumn.

This plant is very hardy in respect to cold, but should have a loamy soft soil, rather moist than dry, and not too much exposed to the sun. It may be propagated by parting of the roots in autumn, but they should not be divided too small; it may also be propagated by seeds, which should be sown in autumn, soon after they are ripe, for those which are sown in the spring, seldom grow the same year; these may be sown on a border exposed to the morning sun.

MINT. See *Mentha*.

MIRABILIS. *Lin. Gen. Plant.* 215. Marvel of Peru, or Four o'Clock Flower.

The Characters are,

The empalement of the flower has five, oval, small leaves. The flower has one funnel-shaped petal, with a long slender tube

sitting upon the nectarium. It hath five, slender, unequal stamina, which adhere to the petal, with a roundish germen within the nectarium, which afterward becomes an oval five-cornered nut, inclosing one seed.

The Species are,

1. MIRABILIS caule erecto, floribus amplioribus. Marvel of Peru with an erect stalk, and large flowers.

2. MIRABILIS caule erecto, geniculis tumentibus, parvo flore. Marvel of Peru with an erect stalk, having swelling joints, and a small flower.

3. MIRABILIS caule decumbente, villoso & viscoso; tubo floris longissimo, fructu rugoso. Marvel of Peru with a declining, hairy, viscous stalk, a very long tube to the flower, and a rough fruit.

The first sort is the Marvel of Peru, which has been many years cultivated in the *English* gardens for ornament; of this there are several varieties, which differ in the colour of their flowers; two of which always retains their difference, one of them has purple and white flowers, which are variable, some of them are plain purple, others are plain white, but most of them are variegated with the two colours, and all these varieties are sometimes upon the same plant, and at others on different plants; the other has red and yellow flowers, which are generally mixed in the same flowers, but are often with plain flowers of both colours on the same plant, intermixed with those which are variegated; but some plants have only plain flowers, and I have never found that the seeds of the purple and white sort ever produced the yellow and red, nor the latter ever vary to the former, and I have constantly cultivated both more than forty years; but although these do not change from one to the other, yet as there is no other difference between them than in the colour of their flowers, I have not enumerated them as distinct species.

The second sort is very common in all the islands of the *West-Indies*, where the inhabitants call it the Four o'Clock Flower, from the flowers opening at that time of the day. Of this sort I have never seen any with variable flowers; they are of a purplish red colour, and not much more than half the size of the other. The stalks of this sort have thick swollen joints; the leaves are smaller, and the fruit is very rough, so there can be no doubt of their being distinct species, for I have never seen any alteration in this from seed, and I have cultivated it more than thirty years. *Tournefort* was informed by father *Plumier*, that the root of this plant was the officinal jalap, upon which he constituted the genus, and gave that title to it; but the late Dr. *Houssoun* was fully informed in the *Spanish West-Indies* of the contrary, and brought over a drawing of the plant which was made by a *Spaniard* at *Halapa*, and he carried two or three of the plants to *Jamaica*, where he planted them in a garden, but after he left the island they were destroyed by hogs; however, he was fully satisfied of its being a *Convolvulus*; indeed the roots of Marvel of Peru are purgative, and when given in a double quantity for a dose, will answer the purpose of jalap.

The third sort was sent from *Mexico*, a few years since. The seeds of this were first sent me from *Paris*, by Dr. *Monier*, of the *Royal Academy of Sciences*, and afterward I had some sent me from *Madrid*, by Dr. *Hortega*. The stalks of this sort fall on the ground, if they are not supported; these grow about three feet long, and divide into several branches, which are garnished with heart-shaped leaves, placed opposite; these, as also the stalks, are hairy and viscous, sticking to the fingers of those that handle them. The flowers come out at the end of the branches; they are white, and have very long slender tubes, and a faint musky odour; these are like the other sorts, closely shut all the day, but expand every evening when the sun declines. The seeds

seeds of this sort are larger than those of any other species, and are as rough as those of the second sort.

The two varieties of the first sort are very ornamental plants in gardens, during the months of *July, August, and September*; and if the season continues mild, they often last till near the end of *October*. The flowers do not open till toward the evening, while the weather continues warm, but in moderate cool weather, when the sun is obscured, they continue open almost the whole day. The flowers are so plentifully produced at the ends of the branches, as that when they are open, the plants seem entirely covered with them, and there being some plain, and others variegated on the same plants, they make a fine appearance.

These plants are propagated by seeds, in the choice of which there should be care taken not to save any from those plants, whose flowers are plain; and those who are desirous of having only the variegated kinds, are careful to pull off all the plain flowers from those plants which they intend for seeds, to prevent their having any seeds; by this method they rarely have any plants with plain flowers.

The seeds should be sown upon a moderate hot-bed in *March*, and when the plants come up; they should have plenty of air admitted to them; when the weather is mild, to prevent their being drawn up weak; and when they are about two inches high, they should be transplanted on another very moderate hot-bed; or if they are each planted in a small pot filled with light earth, and plunged into a moderate hot-bed, it will be a more secure way, for then there will be no danger in shaking them out of the pots, when they are to be planted in the borders, so as to preserve all the earth to their roots; by this method they will not require to be shaded, whereas those which are to be transplanted from the second hot-bed to the borders, often rise with little earth to their roots, so must be carefully shaded, otherwise they often miscarry.

When they are in the second hot-bed, they should be shaded till they have taken fresh root, after which they must have plenty of free air, to prevent their being drawn up weak, and in *May* they must be gradually inured to bear the open air. The beginning of *June*, if the season is favourable, they should be transplanted into the borders of the pleasure-garden, giving them proper room; and after they have taken new root, they will require no further care. If the seeds are sown in a warm border, they will grow very well, but the plants will be late in the season before they flower.

As the seeds of these plants ripen very well every year, so there are not many who are at the trouble of preserving their roots; but if these are taken out of the ground in autumn, and laid in dry sand all the winter, secured from frost, and planted again in the spring, they will grow much larger, and flower earlier than the seedling plants; or if the roots are covered in winter with tanners bark, to keep out the frost, they may remain in the borders, provided the soil be dry. If the roots, which are taken out of the ground, are planted the following spring in large pots, and plunged into a hot-bed under a deep frame, they may be brought forward, and raised to the height of four or five feet, as I have frequently practised, and these plants have come early in the season to flower, so have been intermixed with other ornamental plants, to decorate halls and shady courts, where they have appeared very beautiful.

The other two species require the same treatment, but the second sort is not quite so hardy as the other two, so unless the plants are brought forward in the spring, they will not flower till very late, so their seeds will not ripen.

MISLETOE. See *Viscum*.

MITELLA. *Tourn. Inst. R. H. 241. tab. 126. Lin. Gen. Plant. 496. Bastard Americau Sanicle.*

The Characters are;

The flower has a bell-shaped empalement of one leaf. It hath five petals, which are inserted in the empalement, as are also the ten awl-shaped stamina, which are shorter than the petals. It hath a roundish bifid germen, with scarce any style. The empalement afterward becomes an oval capsule with one cell, opening with two valves, filled with small seeds.

The Species are,

1. MITELLA *scapo diphylo. Lin. Gen. Nov. 29.* Mitella with flower-stalks having two leaves.

2. MITELLA *scapo nudo. Amoen. Acad. 2. p. 252.* Mitella with a naked stalk.

The first sort grows naturally in the woods, in most parts of *North America*. It has a perennial root, from which come out many heart-shaped angular leaves, some of which are obtuse, and others end in acute points; they are indented on their edges, of a lucid green, and stand upon pretty long foot-stalks. The flower-stalks arise immediately from the root, having two or three angular leaves toward the bottom, and about the middle of the stalk come out two small leaves, with acute angles, placed opposite. The stalks rise eight or nine inches high, and are terminated by a loose spike of small whitish flowers, whose petals are fringed on their edges. These appear the beginning of *June*, and are succeeded by roundish capsules, filled with small seeds.

The second sort grows naturally in the northern parts of *Asia*. This is of humbler growth than the first, seldom rising more than five or six inches high. The leaves are not so angular as those of the first sort, and the flower-stalks are always naked, having no leaves. The spikes of flowers are shorter, and more compact.

Both these are propagated by parting of their roots; the best time for this is in autumn; they should be planted in a shady situation, and a soft loamy soil.

MITELLA MAXIMA. See *Bixa*.

MOLDAVICA. See *Dracocephalum*.

MOLLE. See *Schinus*.

MOLLUGO. *Lin. Gen. Plant. 99.*

The Characters are,

The empalement of the flower is composed of five oblong small leaves, coloured on their inside, and permanent. The flower has five oval petals shorter than the empalement, and three bristly stamina, which stand near the style, terminated by single summits, with an oval germen, having three furrows, supporting three very short styles. The germen afterward becomes an oval capsule with three cells, filled with small kidney-shaped seeds.

The Species are,

1. MOLLUGO *foliis verticillatis cuneiformibus acutis, caule subdiviso decumbente, pedunculis unifloris. Hort. Upsal. 24.* Mollugo with acute wedge-shaped leaves growing in whorls, a trailing divided stalk, and foot-stalks bearing a single flower.

2. MOLLUGO *foliis quaternis obovatis, paniculâ dichotomâ. Hort. Cliff. 28.* Mollugo with four leaves at each joint, which are almost oval, and a panicle arising at the division of the branches.

There are two or three other species of this genus, which are rarely admitted into gardens, so I have not enumerated them here.

Both these sorts are annual; the first is a native of warm countries, so is less hardy than the second; they are both trailing plants, whose stalks lye on the ground; the first spreads out eight or nine inches every way, and at each joint is garnished with six or seven small leaves spread out in form of a star. The flowers are small, like those of Chickweed, one standing upon each foot-stalk; these are succeeded by oval capsules, filled with small seeds, which, if permitted to scatter, the plants will come up the following

ing spring without any care ; but when the seeds happen to fall upon earth which is thrown upon a hot-bed, the plants will be forwarder and stronger than those in the open air. This is preserved in some gardens for the sake of variety, but has no great beauty.

The other sort has been already mentioned under the article *HERNIARIA*, but being ranged in this genus by Dr. *Linnaeus*, I have enumerated it here.

MOLUCCELLA. *Lin. Gen. Plant.* 543. *Molucca Balm*.

The Characters are,

The flower hath a large permanent empalement of one leaf, which is deeply indented at the brim, where it spreads open. The flower is of the lip kind, with a short tube. The upper lip is erect, concave, and entire. The under lip is trifid, the middle segment being longer than the other. It has four stamina situated under the upper lip, two of which are shorter than the other, and a germen with four parts, which afterward turns to four angular convex seeds, sitting in the empalement.

The Species are,

1. *MOLUCCELLA calycibus quinquedentatis, denticulis æqualibus*. *Prod. Leyd.* 314. *Molucca Balm*, with empalements indented in five equal parts ; or smooth *Molucca Balm*.

2. *MOLUCCELLA calycibus septemdentatis*. *Prod. Leyd.* 314. *Molucca Balm*, whose empalements are indented in seven parts ; or prickly *Molucca Balm*.

The first sort rises with a square stalk three feet high, spreading out into many smooth branches by pairs, garnished with roundish leaves, set opposite, which are deeply notched on their edges, standing upon long foot-stalks ; they are smooth, of a light green on both sides, and at the base of their foot-stalks the flowers come out in whorls ; these have very large spreading empalements, which are indented in five parts. The flowers are small, and being situated at the bottom of the large empalements, are not visible at a distance ; they are white, with a cast of purple, and shaped like those of the other lip flowers, having the upper lip entire, and hollowed like a spoon, and the under lip is cut into three segments, the middle one being the longest. After the flower is past, the germen turns to four club-shaped angular seeds inclosed in the empalement. It flowers in *July*, but unless the season proves warm and dry, the seeds do not ripen in *England*. The smell of this plant is to some persons very disagreeable, and to others very pleasant.

The second sort hath square smooth stalks, of a purplish colour, which do not rise so high as those of the former, but branch out in the same manner. The leaves are smaller, and stand upon shorter foot-stalks ; they are deeper, and more acutely indented on their edges. The empalements of the flowers are not so large, and cut into seven segments, each being terminated by an acute spine. The flowers are like those of the former species, as are also the seeds ; this is not so hardy as the first sort.

The first grows naturally in several parts of *Syria*, and the second is a native of the *Molucca Islands*, from whence this genus received its title. They are both annual plants, which decay soon after their seeds are ripe, and being natives of warm countries, they seldom perfect their seeds in *England*, when they are sown in the spring ; therefore the best way is to raise the plants in autumn, and plant them in small pots ; these should be placed under a hot-bed frame in winter, where they may have free air in mild weather, by taking off the glasses, but covered in frosty weather, observing to keep them pretty dry, otherwise they are very subject to rot, especially when they are closely covered in frosty weather. In the spring, the plants may be turned out of the pots, with all the earth about their roots, and planted in a warm border, defended from strong winds, giving them a little water to settle the earth to their roots ; after this they will require no other care, but to keep them

clean from weeds, and to support them with stakes, to prevent their being broken by the winds. The plants thus preserved through the winter, will flower the latter end of *June*, so from these good seeds may be expected.

MOLY. See *Allium*.

MOMORDICA. *Tourn. Inst. R. H.* 103. *tab.* 29, 30. *Lin. Gen. Plant.* 967. Male Balsam Apple.

The Characters are,

It hath male and female flowers upon the same plant. The male flowers have an open concave empalement of one leaf. It has three short awl-shaped stamina, which are compressed in a body, and have a reflexed line containing the farina. The female flowers have the same empalement and petal as the male, but sit upon the germen ; these have three short filaments without summits. The germen supports one taper trifid style, crowned by three oblong gibbous stigmas ; and afterward turns to an oblong fruit, opening with an elasticity, having three membranaceous cells, filled with compressed seeds.

The Species are,

1. *MOMORDICA pomis angulatis tuberculatis, foliis glabris patenti-palmatis*. *Hort. Cliff.* 451. Male Balsam Apple with angular warted fruit, and smooth open-handed leaves.

2. *MOMORDICA pomis angulatis tuberculatis, foliis villosis, longitudinaliter palmatis*. *Hort. Cliff.* 451. Male Balsam Apple with angular warted fruit, and hairy leaves, which are longitudinally hand-shaped.

3. *MOMORDICA pomis ovatis acuminatis tuberculatis, foliis glabris palmatis serratis*. Male Balsam Apple, with an oval, acute-pointed, warted fruit, and smooth hand-shaped leaves, which are sawed.

4. *MOMORDICA pomis hispidis, cirrbis nullis*. *Lin. Sp. Plant.* 1010. Male Balsam Apple with a prickly fruit, and no tendrils to the vines ; or Wild Cucumber, and Elaterium of *Boerhaave*.

The first sort grows naturally in *Asia*, the second and third in the island of *Ceylon* ; they are all annual plants, which perish soon after they have ripened their fruit ; these have trailing stalks, like those of the Cucumber and Melon, which extend four or five feet in length, sending out many side branches, with tendrils, by which they fasten themselves to any neighbouring plants, to secure themselves from being tost, and blown about by the winds, and are garnished with leaves shaped like those of the Vine. The leaves of the first and third sorts are smooth, and deeply cut into several segments, and are spread open like a hand ; but those of the second sort are extended more in length, and are hairy. The fruit of the first species is oval, ending in acute points, having several deep angles, which have sharp tubercles placed on their edges ; it changes to a red or purplish colour, when ripe, opening with an elasticity, and throwing out its seeds.

The fruit of the second sort is much longer than that of the first, and not so deeply channelled. The tubercles are scattered all over the surface, and are not sharp like those of the other ; this fruit is yellow when ripe, and casts out its seeds with an elasticity.

The fruit of the third sort is short and pointed like that of the first, but does not swell so large in the middle. The angles of this are not deep, and the whole surface is closely set with large tubercles ; this changes to a deep Orange colour, when ripe, and casts out its seeds in the like manner.

The fourth sort is commonly called Wild or Spurting Cucumber, from its casting out its seeds, together with the viscid juice in which the seeds are lodged, with a violent force, if touched when ripe ; and from hence it has sometimes the appellation of *Noli me tangere*, or Touch me not. This plant grows naturally in some of the warm parts of *Europe*, but in *England* it is cultivated in gardens for the fruit, which

which is used in medicine, or rather the *fæcula* of the juice of the fruit, which is the *Elaterium* of the shops.

This plant hath a large fleshy root, somewhat like that of Briony, from which come forth every spring, several thick, rough, trailing stalks, which divide into many branches, and extend every way two or three feet; these are garnished with thick, rough, almost heart-shaped leaves, of a gray colour, standing upon long foot-stalks. The flowers come out from the wings of the stalk, these are male and female, growing at different places on the same plant, like those of the common Cucumber, but they are much less, of a pale yellow colour, with a greenish bottom: the male flowers stand on short thick foot-stalks, but the female flowers sit upon the young fruit, which, after the flower is faded, grows of an oval form, an inch and a half long, swelling like a Cucumber, of a gray colour like the leaves, and covered over with short prickles. These do not change their colour when ripe, like most of the other fruit of this class, but if attempted to be gathered, they quit the foot-stalk, and cast out the seeds and juice with great violence; so that where any plants are growing, and the fruit permitted to stand till it is ripe, the seeds will be scattered all round to a great distance, and there will be plenty of the plants produced the following spring.

But when the fruit is designed for use, it should always be gathered before it is ripe, otherwise the greatest part of the juice will be lost, which is the only valuable part; for the juice which is expressed, with part of the parenchyma of the fruit, is not to be compared with the other for its virtues; for the *Elaterium* which is made from the clear juice of the fruit, is much whiter, and will retain its virtues much longer than that which is extracted by pressure.

The three first sorts are annual; their seeds must be sown on a hot-bed the beginning of *March*, and when the plants come up, they should be transplanted out into a fresh hot-bed, after the manner of Cucumbers or Melons, putting two plants of the same kind under each light, and the plants watered and shaded until they have taken root; after which they must be treated as Cucumbers, permitting their branches to extend upon the ground in the same manner, and observe to keep them clear from weeds.

With this management (provided you do not let them have too much wet, or expose them too much to the open air) they will produce their fruit in *July*, and their seeds will ripen in *August* and *September*, when you must observe to gather it as soon as you see the fruit open, otherwise it will be cast abroad, and with difficulty gathered up again.

These plants are preserved in curious gardens for the oddness of their fruit; but as they take up a great deal of room in the hot-beds, requiring frequent attendance, and being of little beauty or use, so they are not much cultivated in *England*, except in botanick gardens for variety.

There are some persons who put these plants in pots, and fasten them to stakes, to support the vines from trailing on the ground, and place the pots in stoves; where, when they are skilfully managed, they will produce their fruit tolerably well; and in this way they make a better appearance, than when the vines spread on the ground like Cucumbers and Melons. But when the plants spread on the ground, which is their natural way of growing, they thrive much better, and produce more fruit, than when they are supported; for though these plants have clasps, yet these are not formed for climbing, but merely to fasten themselves about any neighbouring support, to secure them from being raised by the wind and broken, which would often happen, where they grow in the open air and are fully exposed, were it not for this security.

The fourth sort is easily propagated by seeds, which (as was before mentioned) if permitted to scatter, there will be

a supply of plants come up the following spring; or if the seeds are sown upon a bed of light earth, the plants will come up in about a month after, and may be transplanted to an open spot of ground, in rows at three or four feet distance, and almost as far asunder in the rows; if these are carefully transplanted while young, there will be little hazard of their growing; and after they have taken new root, they will require no farther care, but to keep them clear from weeds. If the ground is dry in which these are planted, the roots will continue three or four years, unless the winter should prove very severe, which will sometimes kill them.

MONARDA. *Lin. Gen. Plant.* 34.

The Characters are,

The flower has a cylindrical empalement of one leaf, which is cut into five equal parts at the brim. The flower hath one petal, and is of the lip kind, divided at the top into two lips. The upper lip is narrow, entire, and erect; the under lip is broad, trifid and reflexed. It hath two bristly stamina the length of the upper lip. In the bottom of the tube is situated a four-pointed germen, supporting a slender style involved with the stamina; and crowned by an acute bifid stigma. The germen afterward turns to four naked seeds, inclosed in the empalement.

The Species are,

1. MONARDA *capitulis terminalibus, caule obtus-angulo.* *Hort. Upsal.* 12. Monarda with heads of flowers terminating the stalks, which have obtuse angles.

2. MONARDA *floribus capitatis sub-didynamis, caule acutangulo.* *Lin. Sp. Plant.* Monarda with headed flowers, whose stamina are almost in two bodies, and an acute angular stalk.

3. MONARDA *floribus verticillatis corollis punctatis.* *Hort. Upsal.* 12. Monarda with flowers growing in whorls, whose petals are spotted.

4. MONARDA *floribus capitatis, foliis lævibus serratis.* *Lin. Syst.* 853. Monarda with flowers growing in heads, and smooth sawed leaves.

5. MONARDA *floribus verticillatis, corollis involucre longioribus.* *Lin. Syst.* 853. Monarda with whorled flowers, whose corolla are longer than the empalement.

The first sort grows naturally in *Canada*, and many other parts of *North America*. It hath a perennial root. The stalks rise near three feet high, which are hairy, and have obtuse angles; these send out two or four small side branches toward the top, which, as also the principal stalk, are garnished with oblong leaves, broad at their base, but terminate in acute points; they are hairy, a little indented on their edges, and are placed by pairs. The stalk and branches are terminated by heads of purple flowers, which have a large involucre, composed of five acute-pointed leaves. The flowers have each two stamina which are longer than the petal, with a style of the same length. The flowers appear in *July*, and are succeeded by seeds which ripen in autumn.

The second sort also grows naturally in *North America*, where the inhabitants frequently use the leaves for tea, so it is commonly called *Oswego Tea*, by which title it was brought to *England*. This hath a perennial root. The stalks of this sort are smooth, having four acute angles; they rise about two feet high, and are garnished with smooth, oval, spear-shaped leaves, which are indented on their edges, and stand opposite; these, when bruised, emit a very grateful refreshing odour; the stalks send out toward their top, two or four small side branches, which are garnished with small leaves of the same shape with the other. The flowers are produced in large heads or whorls at the top of the stalk, and there is often a smaller whorl of flowers, growing round the stalk at a joint below the head; and out of the head arises a naked foot-stalk, sustaining a small head or whorl

whorl of flowers; the flowers are of a bright red colour; they have two lips, the upper lip is long, narrow, and entire, the under lip is cut into three parts; they have each two stamina, which are longer than the petal. This plant flowers in *July*, but in a moist season, or when the plants are in a moist soil, they will continue in flower till the middle or latter end of *September*.

Both these sorts may be propagated by parting of their roots; the first does not multiply so fast as the second, but as that produces plenty of seeds, so it may be easily propagated that way: if the seeds are sown in the autumn soon after they are ripe, the plants will come up the following spring; but if they are not sown till spring, the plants seldom rise till the next year. When the plants are come up, and are fit to remove, they should be transplanted into a shady border, at about nine inches distance, and when they have taken new root, they will require no other care but to keep them clean from weeds till the autumn, when they should be transplanted into the borders where they are to remain. The following summer they will flower and produce ripe seeds, but the roots will continue several years, and may be parted every other year to increase them. This loves a soft loamy soil, and a situation not too much exposed to the sun.

The second sort seldom ripens seeds in *England*, but it increases fast enough by its creeping roots, as also by slips or cuttings, which, if planted in a shady border in *May*, will take root, in the same manner as Mint or Balm; but as the roots multiply so fast, there is seldom occasion to use any other method to propagate them.

This sort loves a moist light soil, and in a situation where the plants have only the morning sun, they will continue longer in flower, than those which are exposed to the full sun. This is a very ornamental plant in gardens, and the scent of the leaves is very refreshing and agreeable to most people, and some are very fond of the tea made with the young leaves.

The third sort grows naturally in *North America*; this is seldom more than a biennial root, and probably in its native country may be an annual, for the roots perish after the plants have perfected their seeds. It hath square stalks which rise about two feet high, branching out from the bottom to the top, garnished with spear shaped leaves, which come out in clusters at each joint, where there are two larger leaves placed opposite, and several smaller come out on each side the stalk: the larger leaves are about two inches and a half long, and three quarters of an inch broad, and are slightly indented on their edges. Toward the upper part of the stalk the flowers come out in large whorls, having to each whorl an involucre, composed of ten or twelve small spear-shaped leaves, of a purplish red colour on their inside; the flowers are pretty large, of the same form with those of the other sorts, of a dirty yellow colour spotted with purple; these have each two long stamina situated under the upper lip, which are terminated by bifid compressed summits, and are succeeded by four naked seeds inclosed in the empalement. It flowers in *July*, and if the summer proves favourable, the seeds will ripen in the autumn.

This plant is propagated by seeds, which, if sown on a border of light earth exposed to the east, the plants will rise very freely; when they are fit to remove, they may be transplanted into a shady border, in the same manner as hath been directed for the first sort; and if they should shoot up stalks to flower, they should be cut down to strengthen the roots, that they may put out lateral buds; for when they are permitted to flower the first year, the roots seldom live through the winter, therefore they should be prevented: in the autumn the plants may be removed, and planted in the

open borders of the pleasure-garden, where they will flower the following summer; and if the season should prove dry, they should be duly watered, otherwise they will not be near so beautiful, nor will the plants produce good seeds.

The fourth sort approaches near to the first, but the leaves are smoother, and sawed on their edges; the flowers are almost white, but grow in heads in the same manner as the first. This is a perennial plant, and requires the same treatment as the first.

The fifth sort approaches near to the third, but has not a coloured involucre, nor are the flowers spotted, but the greatest difference between them is in the length of the corolla, which in this is longer than the involucre: It is a biennial, and requires the same treatment as the third.

MONBIN. See Spondias.

MONTIA. See Heliocarpus.

MOREA.

The Characters are,

The flower is very like those of the Iris, but it has six spear-shaped petals which spread open horizontally, three of which are alternately larger than the other, and three erect standards, so these have no falls as the Irises have. The spathe, number of stamina, and the seed-vessel, agrees very nearly to the Iris.

The title of this genus I have added in honour of *Robert More*, Esq; of *Shrewsbury*, who is an excellent botanist, and has a garden well stored with plants.

The Species are,

1. MOREA *spatha biflora*, caule planifolio, floribus minoribus. Fig. Pl. tab. 238. Morea with two flowers in each sheath, plain leaves on the stalk, and smaller flowers.

2. MOREA *spatha uniflora*, caule planifolio, floribus majoribus. Ibid. Morea with one flower in a sheath, plain leaves on the stalk, and larger flowers.

3. MOREA *spatha uniflora*, foliis gladiolatis, floribus alternis. Morea with one flower in a sheath, sword-shaped leaves, and flowers placed alternate.

These plants are natives of the *Cape of Good Hope*, from whence the seeds were brought. The two first have oblong bulbous roots, which early in the spring send out three or four long, narrow, plain leaves, which end in acute points. Toward the end of *March* the flower-stalk arises, which is garnished with two or three smaller leaves, of the same form with those at bottom, and is terminated with one or two spathæ or sheaths, which in those of the first sort is included two flowers, but those of the second have but one. The foot-stalk which sustains the flower is longer than the sheath; the six petals of the flower which spread horizontally, are of a pale blue colour, each having a yellow spot toward the bottom. The three standards which inclose the stamina are white; the flowers appear the latter end of *April*, but open only in the morning, shutting every day at noon. They continue in flower about a fortnight, then the germen, which is situated immediately under the flower, swells to a turgid three-cornered seed vessel, having three cells, filled with roundish seeds, which ripen the end of *June*.

There is but little difference in the colour of the flowers of the two first sorts, but those of the second are the biggest.

The third sort came by the *Dutch* title of *White Water Lily*. The root of this is composed of several fleshy fibres; the leaves are flat and shaped like those of *Iris* or *Flower-de-luce*, and are of a dark green colour. The stalk rises near two feet high, and is garnished at each joint with one small leaf shaped like those below, whose base embraces the stalk; the flower comes out of a smooth sharp-pointed sheath; it is composed of six oval spear-shaped petals, of a dirty white, shaded with a sky blue colour; these are equal in size, and spread open flat. In the center of these arise three forked petals standing erect, of a bluish purple colour;

four; these encompass the stamina and style, the stamina being connected at their base to their tails. The outer petals have a large sulphur-coloured spot in each. Each stalk produces several flowers, which are placed alternately. This sort flowers in *June*, and then the germen swell to a large, oblong, furrowed capsule with three cells, filled with roundish compressed seeds, which do not ripen till winter. The leaves of this sort remain green all the year.

These plants may be propagated by seeds, which should be sown in pots filled with light earth; those of the two first should be sown in *August*, and those of the third soon after they are ripe. The pots should be placed in a hot-bed frame in winter, to screen the seeds from frost. In the spring the plants will appear, when the glasses should be drawn off every day when the weather is mild, to prevent the plants being drawn up weak, and in *May* the pots should be placed abroad in a sheltered situation, where they may enjoy the morning sun, but screened from the great heat. If the season proves dry, the plants must be frequently refreshed with water, but it must not be given them in too great plenty. Toward the latter end of *June* the leaves of the two first sorts will decay, after which, if the roots are too close, they may be transplanted; but as they will be very small, six or seven of them may be planted in one small pot, and then placed on an east border, where they may have only the morning sun, and kept clean from weeds till autumn, when they must be placed into the frame to be screened from frost, but should be always exposed to the open air in mild weather; this should be repeated every winter, and in three years the plants will flower. The time for removing these bulbs is always soon after their stalks and leaves decay. In summer, when they are at rest, they must have very little water, and only require to be kept clean from weeds, and in winter they must be sheltered in a frame.

These may also be propagated by offsets which are produced from the old roots, which will flower the second year.

The third sort may be treated in the same way as the other, but as the leaves of this continue all the year, the best time to transplant them is in *September*, when the roots are in the most inactive state. This may be propagated by parting of the roots, in the same way as is practised for the flag-leaved Iris.

MORINA. *Tourn. Cor.* 48. tab. 480.

The Characters are,

It hath a double empalement, which is tubulous, bifid, of one leaf, and permanent. The flower hath one petal, with a long tube a little incurved. The top is divided into two lips; the upper lip is small and bifid, the under lip is cut into three equal obtuse segments, the middle one being extended beyond the other. It hath two bristly stamina. The globular germen is situated under the flower, supporting a slender style which is longer than the stamina, crowned by a target-shaped stigma; the germen afterward becomes a single seed, crowned by the empalement of the flower.

There is but one Species of this genus at present known, which is,

MORINA. *Hort. Cliff.* 14. Eastern Morina.

This plant was discovered by Dr. *Tournefort*, in his travels in the *Levant*, who gave it this name in honour of Dr. *Morin*, a physician at *Paris*.

It grows naturally near *Erzeron* in *Persia*, and was in the *English* gardens before the severe winter in 1740, which killed all the plants. The root of this plant is taper and thick, running deep into the ground, sending out several thick strong fibres as large as a finger; the stalk rises near three feet high; it is smooth, of a purplish colour toward the bottom, but hairy and green at the top, garnished at each joint by three or four prickly leaves like those of the

Carlina Thistle, of a lucid green on their upper side, armed on their edges with spines. The flowers come out from the wings of the leaves on each side the stalk; these have very long tubes, which are slender at the bottom, but are enlarged upward, and are a little incurved; the brim opens with two large lips, the upper lip is indented at the top and rounded, the lower lip is cut into three obtuse segments; under the upper lip are situated two bristly stamina, which are crooked, and crowned with yellow summits. These flowers appear in *July*, but I never had any seeds succeed from them. Some of the flowers are white, and others of a purplish red on the same plant.

This plant is propagated by seed, which should be sown soon after it is ripe in the autumn, otherwise the plants will not come up the following summer; for I have several times observed, where the seeds have been sown in the spring, they have remained in the ground fourteen or fifteen months before the plants have appeared. These seeds should be sown in the places where the plants are to remain, because they send forth tap roots, which run very deep into the ground; and when these are broken or injured in transplanting, the plants seldom thrive after. They may be sown in open beds or borders of fresh light earth, being careful to mark the places, that the ground may not be disturbed; for it frequently happens, that the seeds do not come up the first year, when they are sown in autumn; but when they are sown in the spring, they never come up the same year. The ground where the seeds are sown must be kept clear from weeds, which is all that is necessary to be done until the plants come up; where they are too close together, they should be thinned so as to leave them near eighteen inches apart; after which time they will require no other culture but to keep them constantly clear from weeds, and in the spring, just before the plants put out new leaves, to stir the ground gently between them, and lay a little fresh earth over the surface of the bed to encourage them.

In autumn these plants decay to the ground, and send forth new leaves the following spring; but it will be three years from the time of the plants first coming up to their flowering, though after that time they will flower every season; and the roots will continue many years, provided they are not disturbed or killed by very severe frost.

MORUS. *Tourn. Inst. R. H.* 589. tab. 363. The Mulberry tree.

The Characters are,

It hath male flowers growing at separate distances from the female, on the same tree. The male flowers are collected in long taper ropes or katkins; these have no petals, but have four long, awl-shaped, erect stamina. The female flowers are collected into roundish heads; these have no petals, but a heart-shaped germen, supporting two long, rough, reflexed styles, crowned by single stigmas. The empalement of these afterward become large, fleshy, succulent fruit, composed of several protuberances, in each of which is lodged one oval seed.

The Species are,

1. MORUS *foliis cordatis scabris*. *Hort. Cliff.* 441. Mulberry with rough heart-shaped leaves; or the common Mulberry.

2. MORUS *foliis palmatis hirsutis*. Mulberry with hand-shaped hairy leaves; smaller black Mulberry with elegant cut leaves.

3. MORUS *foliis cordatis subtus villosis, amentis cylindricis*: *Lin. Sp. Plant.* 986. Mulberry with heart-shaped leaves which are hairy on their under side, and cylindrical katkins.

4. MORUS *foliis obliquè cordatis lævibus*. *Hort. Cliff.* 441. Mulberry with oblique, smooth, heart-shaped leaves; or Mulberry with a white fruit.

5. *MORUS foliis obliquè cordatis acuminatis hirsutis.* Mulberry with oblique, heart-shaped, acute-pointed, hairy leaves; or Fustick wood.

6. *MORUS foliis palmatis, fructibus hispidis.* Lin. Sp. Plant. 986. Mulberry with hand-shaped leaves and prickly fruit.

7. *MORUS foliis ovato-oblongis utrinque æqualibus, inæqualiter ferratis.* Flor. Zeyl. 337. Mulberry with oval oblong leaves, which are equal on both sides, but unequally sawed.

The first sort is the common black Mulberry tree, which is cultivated for the delicacy of its fruit. This tree grows naturally in *Persia*, from whence it was first brought to the southern parts of *Europe*, but is now become common in every part of *Europe*, where the winters are not very severe: for in the northern parts of *Sweden*, these trees will not live in the open air; and in several parts of *Germany* they are planted against walls, and treated in the same way as Peach, and other tender fruits are here.

These trees are generally of both sexes, having male flowers or katkins, on the same tree with the fruit; but it often happens, that some of the trees which are raised from seeds, have only male flowers, and produce no fruit; so that those who plant these trees for their fruit, should never make choice of such as have been propagated by seeds, unless they have seen them produce fruit in the nursery. It is also the surest way to mark such trees as are fruitful in the nursery, at the time when their fruit is upon them, because those trees which are propagated by layers, are sometimes of the male sort; for I have several times observed, that some of the large branches of these trees have produced only katkins, when the other parts of the trees have been very fruitful; so that unless care is taken in the choice of the branches for making the layers, there is the same hazard as in seedling trees: nor should the shoots which come out near the roots of old trees be ever laid down, for these rarely produce fruit until they have been planted many years, although the trees from which these were produced might be very fruitful. I have observed some trees which produced only katkins for many years after they were planted, and afterward have become fruitful; the same I have observed in Walnut trees, and my honoured friend the Chevalier *Rathgeb*, has informed me, that he has observed the same in the Lentisk and Turpentine trees.

The old Mulberry trees are not only more fruitful than the young, but their fruit are much larger and better flavoured; so that where there are any of these old trees, it is the best way to propagate from them, and to make choice of those branches which are most fruitful. The usual method of propagating these trees, is by laying down their branches, which will take root in one year, and are then separated from the old trees; but as the most fruitful branches are often so far from the ground as not to be layed, unless by raising of boxes or baskets of earth upon supports for this purpose, so the better way is to propagate them by cuttings, which, if rightly chosen and skilfully managed, will take root very well; and in this method there will be no difficulty in having them from trees at a distance, and from the most fruitful branches. These cuttings should be the shoots of the former year, with one joint of the two years wood to their bottom; the cuttings should not be shortened, but planted their full length, leaving two or three buds above ground. The best season for planting them is in *March*, after the danger of hard frost is over; they should be planted in light rich earth, pressing the ground pretty close about them; and if they are covered with glasses, it will forward their putting out roots; but where there is not such conveniency, the ground about them should be covered with moss, to prevent its drying; and where this is carefully done, the cuttings will require but little water, and will succeed much better than with having much wet.

If the cuttings succeed well and make good shoots, they may be transplanted the following spring into a nursery where they should be regularly trained to stems, by fixing down stakes to each, to which the principal shoots should be fastened; and most of the lateral branches should be closely pruned off, leaving only two or three of the weakest to detain the sap, for the augmentation of the stem; for when they are quite divested of the side shoots, the sap is mounted to the top, so that the heads of the trees grow too fast for the stems, and become too weighty for their support. In about four years growth in the nursery, they will be fit to transplant where they are to remain; for these trees are transplanted with greater safety while young, than when they are of a large size.

I have two or three times made trial of planting the cuttings of Mulberries on a hot-bed, and have found them succeed extremely well. This I was led to, by observing some sticks of Mulberry trees which were cut for forks, and thrust into the hot-bed, to fasten down the vines of Cucumbers; which, although they had been cut from the tree a considerable time, yet many of them put out roots and shot out branches; so that where any person is in haste to propagate these trees, if the cuttings are planted on a hot-bed, they will take root much sooner than in the common ground.

This tree delights to grow in rich light earth, such as is in most of the old kitchen-gardens about *London*, where there is also a great depth of earth; for in some of those gardens there are trees of a very great age, which are very healthy and fruitful, and their fruit is larger and better flavoured, than those of the younger trees. I have never yet seen any of these trees which were planted in a very stiff soil, or on shallow ground either upon clay, chalk, or gravel, which have been healthy or fruitful, but their stems and branches are covered with moss, so that the little fruit which they sometimes produce are small, ill tasted, and late before they ripen.

If these trees are planted in a situation where they are defended from the strong south and north-west winds, it will preserve their fruit from being blown off; but this shelter whether it be trees or buildings, should be at such a distance, as not to keep off the sun; for where the fruit has not the benefit of his rays to dissipate the morning dews early, they will turn mouldy and rot upon the trees. There is never any occasion for pruning of these trees, more than to cut off any of the branches which may grow across another, so as to rub and wound their bark, by their motion occasioned by the wind; for their shoots should never be shortened, because the fruit is produced on the young wood.

The second sort grows naturally in *Sicily*, from whence I received a parcel of the seeds, and raised a good number of the plants; all of these were totally different in their leaves from the common Mulberry, so that I am certain of its being a distinct species. It is also a tree of humbler growth, but the fruit is small and has no flavour, so is not worth propagating; some of the trees produced fruit two or three years in the *Chelsea* garden.

The white Mulberry is commonly cultivated for its leaves to feed silk worms, in *France*, *Italy*, &c. though the *Persians* always make use of the common black Mulberry for that purpose; and I have been assured by a gentleman of honour, who has made trial of both sorts of leaves, that the worms fed with those of the black produce much better silk than those fed with the white; but he observes, that the leaves of the black sort should never be given to the worms, after they have eaten for some time of the white, lest the worms should burst, which is often the case when they are thus treated.

The trees which are designed to feed silk worms, should never be suffered to grow tall, but rather kept in a sort of hedge;

hedge; and instead of pulling off the leaves singly, they should be sheared off together with their young branches; which is much sooner done, and not so injurious to the tree.

This white sort may be propagated either from seeds or layers, as the black Mulberry, and is equally hardy; but the most expeditious method of raising these trees in quantity, is from the seeds, which may be procured in plenty from the south of *France* and *Italy*. The best way to sow these seeds in *England*, is to make a moderate hot-bed, which should be arched over with hoops, and covered with mats; upon this bed the seeds should be sown in the middle of *March*, and covered over with light earth about a quarter of an inch deep: in very dry weather the bed must be frequently watered, and in the heat of the day shaded with mats, and also covered in the nights when they are cold. With this management the plants will come up in five or six weeks, and as they are tender when they first appear, so they must be guarded against frosty mornings, which often happen in *May*. During the summer they must be kept clean from weeds, which is all the culture they require: but there must be care taken of them the first winter, especially to cover them in autumn, when the first frosts come, which will kill the tender plants to the ground, if they are not protected; the following *March* these plants should be transplanted into the nursery to get strength, where they may remain two or three years, and then should be removed where they are to continue.

There are two or three varieties of this tree, which differ in the shape and size of their leaves, and colour of their fruit; but as they are of no other use than for their leaves, the strongest shooting and that with the largest leaf should be preferred.

The third sort, which is the large-leaved *Virginian* Mulberry with black shoots, is more uncommon than either of the former. The leaves of this are somewhat like those of the common Mulberry tree, but are rougher and longer.

This tree is propagated only by seeds, for it will not take by grafting or budding, either on the black or white Mulberries, for it has often been tried on both, but without success. The seeds of this may be procured from *North America*. This is very hardy, and will endure the cold of our climate in the open air very well, and is coveted as a curiosity by such as delight in the variety of trees and shrubs.

The fifth sort is the tree whose wood is used by the dyers, and is better known by the title of Fustick, which is given to the wood, than by its fruit, which is of no estimation. This grows naturally in most of the islands in the *West-Indies*, but in much greater plenty at *Campeachy*, where it abounds. This wood is one of the commodities exported from *Jamaica*, where it grows in greater plenty than in any other of the *British* islands.

This tree, in the countries where it grows naturally, rises to the height of sixty feet and upward; it has a light brown bark, which hath some shallow furrows; the wood is firm, solid, and of a bright yellow colour. It sends out many branches on every side, covered with a white bark, garnished with leaves about four inches long, which are broad at their base, indented at the foot stalks, where they are rounded, but one side is broader than the other, so that they are oblique to the foot-stalk; these diminish gradually, and end in acute points; they are rough like those of the common Mulberry, of a dark green, and stand upon short foot-stalks. Toward the end of the young branches, come out short katkins of a pale herbaceous colour, and in other parts of the same branches the fruit is produced, growing upon short foot-stalks; they are as large as Nutmegs of a roundish form, full of protuberances like the common Mulberry, green within, and on the outside, of a luscious sweet taste when ripe.

It is too tender to thrive in this country, unless preserved in a warm stove. The seeds of this plant come up very freely on a hot-bed, and when the plants are fit to remove, they should be each planted in a separate small pot filled with fresh light earth, and plunged into a hot-bed of tanners bark, and shaded from the sun till they have taken new root; then they should be treated in the same way as other plants from those hot countries, always keeping them in the tan-bed in the stove, where they will make good progress. These plants retain their leaves all the year in the stove.

The sixth sort grows naturally in *China* and *Japan*, where the inhabitants make paper of the bark; they cultivate the trees for that purpose on the hills and mountains, much after the same manner as Osiers are cultivated here, cutting down the young shoots in autumn for their bark. There were several of these trees raised from seeds a few years past, in the gardens of the Right Hon. the Earl of *Northumberland*, who was so good as to favour me with one of the plants, which thrives very well in the open air, without any shelter, as many of the trees and plants of those countries will do, if they grow on the mountains. This plant makes very strong vigorous shoots, but seems not to be of tall growth, for it sends out many lateral branches from the root upward. The leaves are large, some of them are entire, others are deeply cut into three, and some into five lobes, in form of a hand, while the plants are young; they are of a dark green, and rough to the touch, but of a pale green, and somewhat hairy on the under side, falling off on the first approach of frost in autumn, as do those of the common Mulberry. The description which *Kaempfer* gives of the fruit is, that they are a little larger than Peas, surrounded with long purple hairs, are composed of acini, or protuberances, and when ripe change to a black purple colour, and are full of sweet juice.

This tree may be propagated by laying down of the branches, in the same way as is practised for the common Mulberry, or it may be multiplied by planting of the cuttings, in the same manner as before directed for the common sort.

The seventh sort grows naturally in *India*, where it becomes a large tree. It hath a soft, thick, yellowish bark, with a milky juice like the Fig tree, which is astringent. The branches come out on every side, which are garnished with oblong oval leaves, standing upon short foot-stalks; both sides of these leaves are equal, but their edges are unequally sawed; they are rough, of a dark green on their upper side, but pale on their under, standing alternately on the branches. The flowers come out in round heads at the foot-stalks of the leaves, on each side the branches; they are of an herbaceous white colour; the male flowers have four stamina; the female flowers are succeeded by roundish fruit, which are first green, afterwards white, and when ripe turn to a dark red colour.

The plants are too tender to live out of a stove in this country, for as I raised a good number of the plants, so when they had obtained strength, I placed some of them in different situations, where they were defended from the frost, but not any of them survived the winter, but those which were in the bark-stove, where they are constantly kept, and treated in the same manner as other tender plants, giving them but little water in winter; with which management the plants thrive, and retain their leaves all the year.

MOSCHATELLINA. See Adoxa.

MOSS. See Muscus.

MOTHERWORT. See Cardiaca.

MOULD, the goodness of which may be known by the sight, smell, and touch.

First, by the sight: those moulds that are of a bright Chestnut, or hazelly colour, are counted the best; of this

colour are the best loams, and also the best natural earth; and this will be the better yet, if it cuts like butter, and does not stick obstinately, but is short, tolerably light, breaking into small clods, is sweet, will be tempered without crusting or chapping, in dry weather, or turning to mortar in wet.

The next to that, the dark gray and russet moulds are accounted the best, but the clear tawny is by no means to be approved, and that of a yellowish red colour is accounted the worst of all; this is commonly found in wild and waste parts of the country, and, for the most part, produce nothing but Furz and Fern, according as their bottoms are more or less of a light and sandy, or of a spewy gravel, or clayey nature.

Secondly, by the smell: all lands that are good and wholesome, will, after rain, or breaking up by the spade, emit a good smell.

Thirdly, by the touch: by this means we may discover whether it consists of substances entirely arenaceous or clammy; or, according as it is expressed by Mr. Evelyn, whether it be tender, fatty, detersive, or slippery, or more harsh, gritty, porous, or friable.

That being always the best that is between the two extremes, and does not contain the two different qualities of soft and hard mixed, of moist and dry, of churlish and mild, that is, neither too unctuous or too lean, but such as will easily dissolve, of a just consistence, between sand and clay, and such as will not stick to the spade or fingers upon every flash of rain.

MULBERRY. See Morus.

MULLEIN. See Verbascum.

MUMMY, is a sort of grafting wax, made of one pound of common black pitch, and a quarter of a pound of common turpentine, put into an earthen pot, and set on the fire in the open air: in doing this, you ought to hold a cover in your hand, ready to cover it, in order to quench it, by putting it thereon, which is to be done several times, setting it on the fire again, that the nitrous and volatile parts may be evaporated. The way to know when it is enough, is by pouring a little of it upon a pewter plate, and if it be so it will coagulate presently; then this melted pitch is to be poured into another pot, and a little common wax is to be added to it, mixing them well together, and then to be kept for use.

MUNTINGIA. Plum. Gen. Nov. 41. tab. 6. Lin. Gen. Plant. 575.

The Characters are,

The empalement of the flower is cut into five segments. The flower hath five heart-shaped petals, inserted in the empalement, and spread open like a Rose. It has a great number of stamina. In the center is situated a roundish germen, having no style, but is crowned by a stigma divided into many parts. The germen afterward turns to a soft fruit, with one cell, crowned by the stigma, like a navel, and filled with small seeds.

The Species are,

1. MUNTINGIA foliis cordato-lanceolatis acuminatis subtus tomentosis, pedunculis unifloris. Muntingia with heart spear-shaped leaves, ending in acute points, woolly on their under side, and foot-stalks having one flower.
2. MUNTINGIA foliis lanceolatis scabris trinervis, floribus confertis axillaribus sessilibus. Muntingia with rough spear-shaped leaves, having three veins, and flowers growing in clusters from the wings of the stalk, sitting close.
3. MUNTINGIA foliis oblongo-ovatis acutis rugosis, floribus alaribus confertis pedunculatis. Muntingia with oblong, oval, acute, rough leaves, and flowers growing in clusters upon foot-stalks at the wings of the stalk.

The first sort is figured and described by Sir Hans Sloane, in his *History of Jamaica*, by the title of *Lati arboris folio*

angustiore, rubi flore, fructu polyspermo umbilicato. 2. p. 80.

This tree rises to the height of thirty feet or more, in its native soil, sending out many branches toward the top, which are garnished with oblong heart-shaped leaves, which end in acute points, are very woolly on their under side, but smooth above, of a lucid green, slightly sawed on their edges, and placed alternately. The flowers come out from the wings of the stalk, standing upon long foot-stalks; they are composed of five heart-shaped petals, which are white, and spread open, resembling those of the Bramble, having many stamina, about half the length of the petals, terminated by globular summits, and in the center is situated a roundish germen, crowned by a many-pointed stigma. The germen afterward turns to a pulpy umbilicated fruit, as large as the fruit of the Cockspur Hawthorn, and, when ripe, of a dark purple colour, inclosing many small, hard, angular seeds. This sort has produced flowers and fruit in *England*.

The second sort grows naturally in *Jamaica*. This seldom rises more than twelve or fourteen feet high, sending out many branches the whole length, which are covered with a dark brown bark, garnished with spear-shaped leaves, about two inches long, and half an inch broad; they are very rough, and their borders are reflexed, standing alternately pretty close together, on very short foot-stalks. The flowers come out at every leaf in clusters, sitting very close to the stalks; they are small, white, and shaped like those of the first, and are succeeded by small umbilicated fruit, of a yellowish colour when ripe.

The third sort grows in the *West-Indies*, where it rises from twelve to fifteen feet high, sending out many hairy branches, covered with a light brown bark, garnished with oval leaves, ending in acute points; they are rough, and a little hairy, have six veins, which come out from the midrib, two arising near the base, two more a little higher, and the other two near the point; these diverge toward the borders of the leaf, but meet again at the point; they are of a yellowish green. The flowers come out in small clusters from the side of the branches, standing upon short foot-stalks; they are small, of a yellowish colour, and shaped like those of the other sorts, and are succeeded by small Orange-coloured fruit.

These plants are propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark. The seeds will often remain in the ground a whole year before the plants will appear, in which case the pots must be kept constantly clear from weeds, and should remain in the hot-bed till after *Michaelmas*, when they may be removed into the stove, and plunged into the bark-bed, between other pots of tall plants, where there is not room for plants to stand, where they may remain. During the winter season, these pots should be now and then watered, when the earth appears dry, and in the beginning of *March* the pots should be removed out of the stove, and placed into a fresh bark-bed under frames, which will bring up the plants soon after.

When the plants are come up about two inches high, they should be carefully taken out of the pots, and each planted into a separate small pot filled with light rich earth, and then plunged into the hot-bed again, observing to shade them from the sun, until they have taken new root; after which time they should be duly watered, and in warm weather they must have a large share of fresh air. In this hot-bed the plants may remain till autumn, when the nights begin to be cold; at which time they should be removed into the stove, and plunged into the bark-bed. During the winter season, these plants must be kept warm, especially while they are young, and frequently refreshed with water; but it must not be given to them in large quantities, lest it rot the tender fibres of their roots. It will be proper to

continue

continue these plants in the stove all the year, but in warm weather they should have a large share of air; but as the plants grow in strength, they will be more hardy, and may be more exposed in summer, and in winter will live in a dry stove, if kept in a moderate degree of heat.

MURUCUIA. See Passiflora.

MUSA. Plum. Nov. Gen. 24. tab. 34. Lin. Gen. Plant. 1010. The Plaintain tree.

The Characters are,

It hath male and hermaphrodite flowers upon the same stalk; these are produced on a single stalk (or spadix); the male flowers are situated on the upper part of the spike, and the hermaphrodite below; these are in bunches, each bunch having a sheath or cover, which falls off. The flowers are of the lip kind. The petals constitute the upper lip, and the nectarium the under; they have six awl-shaped stamina, five of which are situated in the petal, and the sixth in the nectarium; this is double the length of the other, terminated by a linear summit, the others have none. The germen is situated under the flower, which is long, having three obtuse angles supporting an erect cylindrical style, crowned by a roundish stigma. The germen afterward turns to an oblong, three-cornered, fleshy fruit, covered with a thick rind, divided into three parts.

The Species are,

1. MUSA *spadice nutante, fructu longiore triquetro*. Musa with a nodding spike, and a long three-cornered fruit; commonly called Plaintain tree.

2. MUSA *spadici nutante, fructu brevior obtuse-angulo*. Musa with a nodding spike, and a short fruit with obtuse angles; commonly called Banana.

The first sort is cultivated in all the islands of the *West-Indies*, where the fruit serves the negroes for bread, and some of the white people also prefer it to most other things, especially to the Yams, and Cassada bread.

This plant rises with a soft herbaceous stalk fifteen or twenty feet high; the lower part of the stalk is often as large as a man's thigh, diminishing gradually to the top, where the leaves come out on every side; these are often six feet long, and near two feet broad, with a strong fleshy midrib, and a great number of transverse veins running from the midrib to the borders. The leaves are thin and tender, so that where they are exposed to the open air, they are generally torn by the wind, for as they are large, the wind has great power against them; these leaves come out from the center of the stalk, and are rolled up at their first appearance, but when they are advanced above the stalk, they expand and turn backward; as these leaves come up rolled in the manner before-mentioned, their advance upward is so quick, that their growth may almost be discerned by the naked eye; and if a fine line is drawn across, level with the top of the leaf, in an hour's time the leaf will be near an inch above it. When the plant is grown to its full height, the spike of flowers will appear in the center, which is often near four feet in length, and nods on one side. The flowers come out in bunches, those on the lower part of the spike being the largest, the others diminish in their size upward; each of these bunches is covered with a spathæ, or sheath, of a fine purple colour, which drops off when the flowers open. The upper part of the spike is made up of male or barren flowers, which are not succeeded by fruit, but fall off with their covers. The fruit of this is eight or nine inches long, and above an inch diameter, a little incurved, and has three angles; it is at first green, but when ripe of a pale yellow colour. The skin is tough, and within is a soft pulp of a luscious sweet flavour. The spikes of fruit are often so large, as to weigh upward of forty pounds.

The fruit of this sort is generally cut before it is ripe, and roasted in the embers, then is eaten instead of bread.

The leaves are used for napkins and table-cloths, and are food for hogs.

The second sort, which is commonly called Banana, differs from the first, in having its stalks marked with dark purple stripes and spots. The fruit is shorter, straighter, and rounder; the pulp is softer, and of a more luscious taste, so is generally eaten by way of desert, and seldom used in the same way as the Plaintain, therefore is not cultivated in such plenty.

Both these plants were carried to the *West-Indies*, from the *Canary Islands*, to which place it is believed they were carried from *Guinea*, where they grow naturally; they are also cultivated in *Egypt*, and in most other hot countries, where they grow to perfection in about ten months, from their first planting to the ripening of their fruit, when their stalks are cut down, and several suckers come up from the root; soon after which they will also produce fruit in ten months after, so that by cutting down the stalks at different times, there is a constant succession of fruit all the year.

In *Europe* there are some of these plants preserved in the gardens of curious persons, who have hot-houses capacious enough for their reception, in many of which they have ripened their fruit very well; but as they grow very tall, and their leaves are large, they require more room in the stove, than most people care to allow them; they are propagated by suckers, which come from the roots of those plants which have fruited; and many times the younger plants, when they are stunted in growth, will put out suckers; these should be carefully taken off, preserving some fibres to their roots, and planted in pots filled with light rich earth, and plunged into the tan-bed in the stove; they may be taken off any time in summer, and it is best to take them off when young, because if their roots are grown large, they do not put out new fibres so soon, and when the thick part of the root is cut in taking off, the plants often rot.

During the summer season these plants must be plentifully watered, for the surface of their leaves being large, there is a great consumption of moisture, by perspiration, in hot weather, but in the winter they must be watered more sparingly, though at that season they must be often refreshed, but it must not be given them in such quantities.

The pots in which these plants are placed, should be large, in proportion to the size of the plants, for their roots generally extend pretty far, and the earth should be rich and light. The degree of heat with which these plants thrive best, is much the same with the Anana, or Pine Apple, in which I have had many of these plants produce their fruit in perfection, and they were near twenty feet high.

The most sure method to have these plants fruit in *England* is, after they have grown for some time in pots, so as to have made good roots, to shake them out of the pots with the ball of earth to their roots, and plant them into the tan-bed in the stove, observing to lay a little old tan near their roots, for their fibres to strike into, and in a few months the roots of these plants will extend themselves many feet each way in the bark, and these plants will thrive a great deal faster than those which are confined in pots or tubs. When the bark-bed wants to be renewed with fresh tan, there should be great care taken of the roots of these plants, not to cut, or break them, as also to leave a large quantity of the old tan about them, because, if the new tan is laid too near them, it will scorch their roots, and injure them. If the plants push out their flower-stems in the spring, there will be hopes of their perfecting their fruit, but when they come out late in the year, the plants will sometimes decay before the fruit is ripe. The stoves in which these plants are placed, should be at least twenty feet in height, otherwise there will not be room for their leaves to expand; for when the plants are in vigour, the leaves are often eight feet in length, and

near three feet broad; so that if the stems grow to be fourteen feet to the division of the leaves, and the house is not twenty feet high, the leaves will be cramped, which will retard the growth of the plant; besides, when the leaves are bent against the glass, there will be danger of their breaking them, when they are growing vigorously; for I have had, in one night, the stems of such bent leaves force through the glass, and by the next morning advanced two or three inches above the glass.

I have seen some bunches of fruit of the first sort, which were upward of forty pounds weight, and perfectly ripe in *England*; but this is not so good a fruit, as to tempt any person to be at the expence of raising them in *England*: the second sort is preferred to the first, for the flavour of its fruit, in all those hot countries where these plants abound; the bunches of these are not near so large as those of the first sort, nor are the single fruit near so long; these change to a deeper yellow colour, as they ripen, but their taste is somewhat like that of mealy Figs. Some persons who have resided in the *West-Indies*, having eaten some of these fruit, which were produced in *England*, have thought them little inferior to those which grew in *America*; and I imagine, that the inhabitants of those countries would not esteem these fruits so much, had they variety of other sorts; but, for want of better, they eat many kinds of fruit, which would not be valued in *Europe*, could they be obtained in perfection.

MUSCARI. *Tourn. Inst. R. H.* 347. *tab.* 180. Musk, or Grape Hyacinth.

The Characters are,

The flower has no empalement. It hath one oval pitcher-shaped petal, which is reflexed at the brim. It hath three nectariums on the top of the germen, and six awl-shaped stamina, which are shorter than the petal, whose summits join together. In the center is situated a roundish three-cornered germen, supporting a single style, crowned by an obtuse stigma. The germen afterward turns to a roundish three-cornered capsule, having three cells filled with roundish seeds.

The Species are,

1. MUSCARI *corollis globosis uniformibus, foliis canaliculato-cylindricis*. Muscari with uniform globular petals, and cylindrical gutter-shaped leaves; commonly called Grape Hyacinth.

2. MUSCARI *corollis angulato-cylindricis, summis sterilibus longius pedicellatis*. Muscari with angular cylindrical petals, which on the top of the spike are barren, and have longer foot-stalks; commonly called Fair-haired Hyacinth.

3. MUSCARI *corollis ovatis*. Muscari with oval petals; commonly called Musk Hyacinth.

4. MUSCARI *floribus paniculatis monstrosis*. Muscari with monstrous flowers growing in panicles; called Feathered Hyacinth.

5. MUSCARI *paniculâ ramosâ, floribus monstrosis*. Muscari with a branching panicle, and monstrous flowers.

6. MUSCARI *corollis irregularibus sexpartitis*. *Lin. Sp. Plant.* 318. Muscari with irregular petals, which are cut into six parts.

The first sort grows naturally in the vineyards and arable fields, in *France*, *Italy*, and *Germany*, and where it is once planted in a garden, it is not easily rooted out again; for the roots multiply greatly, and if they are permitted to scatter the seeds, the ground will be filled with the roots: there are three varieties of this, one with blue, another with white, and a third with Ash-coloured flowers; it hath a small, round, bulbous root, from which come out many narrow gutter-shaped leaves; between these arise the flower-stalk, which is naked below, but toward the top garnished with a close spike of blue flowers, shaped like pitchers, sitting very close to the stalk; these smell like fresh starch, or the stones of

Plums which are fresh. They flower in *April*, and the seeds ripen the latter end of *June*.

The second sort grows naturally in *Spain* and *Portugal*, from whence I have received both roots and seeds. This hath a bulbous root, as large as a middling Onion, from which come out five or six leaves a foot long, and three quarters of an inch broad at their base, diminishing gradually to a point. The flower-stalk rises about a foot high, naked the lower half, but the upper is garnished with cylindrical, angular, purple flowers, standing upon foot-stalks half an inch long; these grow horizontally, but the stalk is terminated by a tuft of flowers, whose petals are oval, and have neither germen or style, so are barren. This sort flowers the latter end of *April*, or the beginning of *May*; there is a variety of this with white, and another with blue flowers, but the purple is the most common.

The third sort hath pretty large, oval, bulbous roots, from which arise several leaves, which are about eight or nine inches long, and half an inch broad, which end in obtuse points; these embrace each other at their base; out of the middle of these, the naked stalk which sustains the flowers arises, garnished at the top with small flowers growing in a spike; these have oval pitcher-shaped petals, which are reflexed at their brim, and are of an Ash-coloured purple, or obsolete colour, seeming as if faded, but have an agreeable musky scent; the stalks do not rise more than six inches high, so the flowers make no great appearance, but where they are in some quantity, they will perfume the air to a considerable distance. This sort flowers in *April*, and the seeds ripen in *July*.

Of this there are two varieties, one of which has the same coloured flowers with this here enumerated, on the lower part of the spike, but they are larger, and have more of the purple cast, but the flowers on the upper part of the spike are yellow, and have a very grateful odour. The *Dutch* gardeners title it *Tibcadi Muscari*. As this is supposed to be only a femal variety of the third, I have not enumerated it as distinct. There is another variety of this with very large yellow flowers, that has been lately raised from seeds in *Holland*, which the florists there sell for a guinea a root.

The fourth sort hath a large bulbous root, from which come out several plain leaves. The flower-stalks rise near a foot and a half high, and are terminated by panicles of flowers standing upon long foot-stalks, each sustaining three, four, or five flowers, whose petals are cut into slender filaments, like hairs; they are of a purplish blue colour, and have neither stamina or germen, so do never produce seeds. It flowers in *May*, and, after the flowers are past, the stalks and leaves decay to the root, and new ones arise the following spring.

The fifth sort has a round, solid, bulbous root, covered with a purple skin. The leaves are about the same length with those of the former sort, but are narrower, and their borders are incurved, so are formed gutter fashion. The stalks rise about a foot high, but are slender, so that unless they are supported, they decline toward the ground, especially when the flowers come out; these have two or three long narrow leaves; the stalks are naked to the panicle, which is much shorter than that of the former sort, but branches out wide on every side. The petals of the flowers are cut into finer filaments, which turn back, like the curls of hair; these have neither stamina or style, so never produce seeds; they are of a dark purple colour, and appear in *May*; in *July* the stalks and leaves decay to the root: this has been an old inhabitant in some of the *English* gardens, but from whence it originally came is not easy to trace.

The sixth sort grows naturally at the *Cape of Good Hope*. This hath a small, white, bulbous root, about the size of a Hazel

Hazel nut, from which comes out generally but two (though sometimes when the roots are strong) three leaves, which are five or six inches long, and one inch and a half broad in the middle, ending in obtuse points; these are of a lucid green, and have many spots or protuberances on their upper surface. The flower-stalk rises between them to the height of six or seven inches; it is round, smooth, and naked for three inches high, or more, and is terminated by a spike of flowers, which are of a pale sulphur colour; these have no foot-stalks; they have one petal, which is of an irregular figure, and cut at the top into six parts. The stamina are almost equal with the petal, and stand round the style, which is of the same length. The flowers appear in *March*, but are seldom succeeded by good seeds here.

The five first sorts are very hardy, so will thrive in the open air, and require no other culture than any other hardy, bulbous-rooted flowers, which is to take up their roots every second or third year, to separate their bulbs, for as some of the sorts multiply pretty fast, so when they are become large bunches, they do not flower so strong, as when they are single; the best time to take them out of the ground, is soon after their stalks and leaves are decayed; then they should be spread on a mat, in a dry shady room, for a fortnight to dry, after which they may be kept in boxes like other bulbous roots, till *Michaelmas*, when they may be planted again in the borders of the flower-garden, and treated in the same way as the common hardy kinds of Hyacinths.

The first sort should not be admitted into the flower-garden, because the roots will propagate so fast, as to become a troublesome weed there.

The second sort has but little beauty, so a few of these only should be allowed a place merely for the sake of variety: this is so hardy, as to thrive in any soil or situation.

The third sort merits a place for the extreme sweetness of its flowers, but especially that variety of it with yellow flowers, called Tibcady.

The fourth and fifth sorts may also be allowed to have place in the common borders of the pleasure-garden, where they will add to the variety, and are by no means to be despised.

They are all easily propagated by offsets, which most of their roots send out in pretty great plenty, so that there is little occasion for sowing of their seeds, unless it be to gain some new varieties.

The sixth sort is too tender to thrive in the open air in *England*, so the roots must be planted in small pots, filled with light rich earth, and in the autumn they should be placed under a hot-bed frame, where they may be protected from frost, but should have as much free air as possible in mild weather; for when these are placed in a green-house, their leaves are drawn long and narrow, and the flower-stalks are generally weak, so never flower so well as when they have plenty of free air. These flowers will continue a month where they are not drawn, but will decay in half that time in a green-house.

These roots should be transplanted in *July*, when their stalks and leaves are decayed; and should be placed in the open air during the summer season, but should have very little water when their leaves are decayed.

MUSCIPULA. See *Silene*.

MUSCOSE, MUSCOSUS, Mossy, or abounding with Moss.

MUSCOSITY, Mossiness.

MUSCUS, Moss.

These, though formerly supposed to be only excrescences produced from the earth, trees, &c. yet are no less perfect plants than those of greater magnitude, having roots, branches, flowers, and seeds, but yet cannot be propagated from the latter by any art.

The botanists distinguish these into several genera, under each of which are several species; but as they are plants of no use or beauty, it would be to no purpose to enumerate them in this place.

MUSHROOMS are, by many persons, supposed to be produced from the putrefaction of the dung, earth, &c. in which they are found; but notwithstanding this notion is pretty generally received amongst the unthinking part of mankind, yet by the curious naturalists they are esteemed perfect plants, though their flowers and seeds have not as yet been perfectly discovered. But since they may, and are annually propagated by the gardeners near *London*, and are (the esculent sort of them) greatly esteemed by most curious palates, I shall briefly set down the method practised by the gardeners who cultivate them for sale.

But first, it will not be improper to give a short description of the true eatable kind, since there are several unwholesome sorts, which have been by unskilful persons gathered for the table.

The true Champignon, or Mushroom, appears at first of a roundish form like a button; the upper part of which, as also the stalk, is very white, but being opened, the under part is of a livid flesh colour; but the fleshy part, when broken, is very white: when these are suffered to remain undisturbed, they will grow to a large size, and explicate themselves almost to a flatness, and the red part underneath will change to a dark colour.

In order to cultivate them, if you have no beds in your own, or in neighbouring gardens, which produce them, you should look abroad in rich pastures, during the months of *August* and *September*, until you find them (that being the season when they are naturally produced); then you should open the ground about the roots of the Mushrooms, where you will find the earth, very often, full of small white knobs, which are the offsets, or young Mushrooms; these should be carefully gathered, preserving them in lumps with the earth about them: but as this spawn cannot be found in the pasture, except at the season when the Mushrooms are naturally produced, you may probably find some in old dunghills, especially where there has been much litter amongst it, and the wet hath not penetrated it to rot it; as likewise by searching old hot-beds it may be often found, for this spawn has the appearance of a white mold, shooting out in long strings, by which it may be easily known, wherever it is met with: or this may be procured by mixing some long dung from the stable, which has not been thrown on a heap to ferment; which being mixed with strong earth, and put under cover to prevent wet getting to it, the more the air is excluded from it, the sooner the spawn will appear; but this must not be laid so close together as to heat, for that will destroy the spawn: in about two months after, the spawn will appear, especially if the heap is closely covered with old thatch, or such litter as hath lain long abroad, so as not to ferment, then the beds may be prepared to receive the spawn: these beds should be made of dung, in which there is good store of litter, but this should not be thrown on a heap to ferment; that dung which hath lain spread abroad for a month or longer, is best; these beds should be made on dry ground, and the dung laid upon the surface; the width of these beds at bottom should be about two feet and a half, or three feet, the length in proportion to the quantity of Mushrooms desired; then lay the dung about a foot thick, covering it about four inches with strong earth. Upon this lay more dung, about ten inches thick; then another layer of earth, still drawing in the sides of the bed, so as to form it like the ridge of a house, which may be done by three layers of dung and as many of earth. When the bed is finished, it should be covered with litter or old thatch, to keep out wet, as also

to prevent its drying; in this situation it may remain eight or ten days, by which time the bed will be in a proper temperature of warmth to receive the spawn; for there should be only a moderate warmth in it, great heat destroying the spawn, as will also wet; therefore when the spawn is found, it should always be kept dry until it is used, for the drier it is, the better it will take in the bed; for I had a parcel of this spawn, which had lain near the oven of a stove upward of four months, and was become so dry, that I despaired of its success; but I never have yet seen any which produced so soon, nor in so great quantity as this.

The bed being in a proper temperature for the spawn, the covering of litter should be taken off, and the sides of the bed smoothed; then a covering of light rich earth, about an inch thick, should be laid all over the bed, but this should not be wet; upon this the spawn should be thrust, laying the lumps two or three inches asunder; then gently cover this with the same light earth, above half an inch thick, and put the covering of litter over the bed, laying it so thick as to keep out wet, and prevent the bed from drying: when these beds are made in the spring or autumn, as the weather is in those seasons temperate, so the spawn will then take much sooner, and the Mushrooms will appear perhaps in a month after making; but those beds which are made in summer, when the season is hot, or in winter, when the weather is cold, are much longer before they produce.

The great skill in managing of these beds is, that of keeping them in a proper temperature of moisture, never suffering them to receive too much wet: during the summer season, the beds may be uncovered to receive gentle showers of rain at proper times; and in long dry seasons the beds should be now and then gently watered, but by no means suffer much wet to come to them; during the winter season they must be kept as dry possible, and so closely covered as to keep out cold. In frosty or very cold weather, if some warm litter shaken out of a dung heap is laid on, it will promote the growth of the Mushrooms; but this must not be laid next the bed, but a covering of dry litter between the bed and this warm litter; and as often as the litter is found to decay, it should be renewed with fresh; and as the cold increases, the covering should be laid so much thicker. If these things are observed, there may be plenty of Mushrooms produced all the year; and these produced in beds, are much better for the table than any of those which are gathered in the fields.

A bed thus managed, if the spawn takes kindly, will continue good for several months, and produce great quantities of Mushrooms; from these beds when they are destroyed, you should take the spawn for a fresh supply, which may be laid up in a dry place until the proper season of using it; which should not be sooner than five or six weeks, that the spawn may have time to dry before it is put into the bed, otherwise it will not succeed well.

Sometimes it happens, that beds thus made do not produce any Mushrooms till they have lain five or six months, so that these beds should not be destroyed, though they should not at first answer expectation; for I have frequently known these to have produced great quantities of Mushrooms afterward, and have continued a long time in perfection.

MUSTARD. See Sinapis.

MYAGRUM. *Tourn. Inst. R. H.* 211. tab. 99. Gold of Pleasure.

The Characters are,

The empalement of the flower is composed of four oblong coloured leaves. The flower hath four roundish obtuse petals, placed in form of a cross. It hath six stamina the length of the petals, four of which are a little longer than the other. In the

center is situated an oval germen, which afterward becomes a turbinated, heart-shaped, little pod, having two valves, with the rigid style in the top, inclosing roundish seeds.

The Species are,

1. MYAGRUM *filiculis ovatis, pedunculatis polyspermis.* Hort. Cliff. 328. Myagrum with oval pods having foot-stalks, inclosing one seed; commonly called Gold of Pleasure.

2. MYAGRUM *filiculis cordatis pedunculatis polyspermis, foliis denticulatis obtusis.* Myagrum with heart-shaped pods standing upon foot-stalks, having many seeds and indented leaves.

3. MYAGRUM *filiculis globosis compressis punctato-rugosis.* Hort. Cliff. 328. Myagrum with globular, compressed, small pods, having rough punctures; or Field Charlock with an acute-eared leaf.

4. MYAGRUM *filiculis biarticulatis dispermis, foliis extrorsum sinuatis denticulatis.* Hort. Upsal. 182. Myagrum with short pods, having two joints and two seeds, whose outer leaves are sinuated and indented.

5. MYAGRUM *filiculis cordatis subsessilibus, foliis amplexicaulis.* Hort. Upsal. 182. Myagrum with small heart-shaped pods sitting close to the stalk, and the leaves embracing it.

The first sort grows naturally in Corn fields in the south of France and Italy; I have also found it growing in the Corn in Easthampsted Park, the seat of the late William Trumbull, Esq; but it is not common in this country. It is an annual plant with an upright stalk, about a foot and a half high, sending out two or four side branches, which grow erect; they are smooth, and have a fungous pith; the lower leaves are of a pale or yellowish green, and are eared at their base; those upon the stalks diminish in their size all the way up, are entire, and almost embrace the stalks with their base. The flowers grow in loose spikes at the end of the branches, standing upon short foot-stalks an inch long; they are composed of four small yellowish petals, placed in form of a cross; these are succeeded by oval capsules, which are bordered and crowned at the top with the style of the flower, having two cells, which are filled with red seeds.

The second sort is also an annual plant, and differs from the first in having a taller stalk; the leaves are much longer, narrower, and are regularly indented on their edges, ending in obtuse points. The flowers are larger, but of the same form and colour; the capsules are much larger, and are shaped like a heart. Both these plants flower in June and July, and their seeds ripen in September.

The third sort grows naturally on the borders of arable fields, in the south of France and Italy. This is an annual plant, whose lower leaves are five or six inches long; they are hairy and succulent; their base is eared, and they end in acute points. The stalks rise a foot and a half high, they are brittle and hairy, branching out toward the top like the two former, and are terminated by short loose spikes of small pale flowers, which are succeeded by small, rough, roundish capsules, compressed at the top. It flowers in July, and the seeds ripen in autumn.

The fourth sort grows naturally amongst the Corn, in France and Germany. This is also an annual plant, the lower leaves are large, jagged, and hairy; the stalks branch out from the bottom, and are garnished with hairy leaves, unequally jagged. The stalks are terminated by very long loose spikes of yellow flowers, which are succeeded by short pods with two joints, each including one roundish seed. It flowers about the same time with the former.

The fifth sort grows naturally in the south of France and Italy; this hath a smooth branching stalk upward of two feet high; the lower leaves are five or six inches long, smooth, succulent, and a little indented; the upper leaves almost

almost embrace the stalks with their base. The flowers are produced in long loose spikes, which are yellow, and sit close to the stalk; these are succeeded by heart-shaped compressed pods, divided into two cells by a longitudinal partition, each containing one roundish seed. It flowers at the same time with the former.

If the seeds of all these plants are permitted to scatter in the autumn, the plants will rise without any care, and only require to be thinned and kept clean from weeds. These autumnal plants will always ripen their seeds, whereas those which are sown in the spring sometimes fail.

MYOSURUS, Moustail.

This plant is very near akin to the *Ranunculus*, under which genus it is ranged by some botanists; the flowers are extremely small, and are succeeded by long slender spikes of seeds, resembling the tail of a mouse, from whence it had the name. It grows wild upon moist grounds in divers parts of *England*, where it flowers the latter end of *April*, and the seeds ripen a month after, when the plants decay, being annual.

MYRICA. *Lin. Gen. Plant.* 981. The Candleberry Myrtle, Gale, or Sweet Willow.

The Characters are,

The male flowers are upon different plants from the female; the male flowers are produced in a loose, oblong, oval katkin, imbricated on every side; under each scale is situated one moon-shaped flower, having no petal, but hath four or six short slender stamina, terminated by large twin summits, whose lobes are bifid. The female flowers have neither petal or stamina, but an oval germen supporting two slender styles, crowned by single stigmas. The germen afterward becomes a berry with one cell, inclosing a single seed.

The Species are,

1. MYRICA foliis lanceolatis subserratis, caule fruticoso. *Lin. Sp. Plant.* 1024. Myrica with spear-shaped sawed leaves, and a shrubby stalk; sweet Willow, Dutch Myrtle, or Gale.

2. MYRICA foliis lanceolatis integerrimis, caule fruticoso. Myrica with entire spear-shaped leaves, and a shrubby stalk; commonly called Candleberry Myrtle.

3. MYRICA foliis ovato-lanceolatis serratis, caule fruticoso. Myrica with spear-shaped sawed leaves, and a shrubby stalk; or *Carolina* Candleberry tree, with broader leaves which are more sawed.

4. MYRICA foliis oblongis alternatim sinuatis. *Hort. Cliff.* 450. Myrica with oblong leaves, which are alternately sinuated; or *Maryland* Gale with a Spleenwort leaf.

5. MYRICA foliis oblongis oppositè sinuatis glabris. Myrica with oblong smooth leaves, which are oppositely sinuated.

6. MYRICA foliis oblongis oppositè sinuatis hirsutis. Myrica with oblong hairy leaves, which are oppositely sinuated.

7. MYRICA foliis subcordatis serratis sessilibus. *Hort. Cliff.* 456. Myrica with sawed leaves which are almost heart-shaped, and sit close to the stalk.

The first sort grows naturally upon bogs in many parts of *England*, particularly in the northern and western counties, as also in *Windsor Park*, and near *Tunbridge Wells*. This rises with many shrubby stalks near four feet high, which divide into several slender branches, garnished with stiff spear-shaped leaves, of a light or yellowish green, smooth, and a little sawed at their points, and emit a fragrant odour when bruised. The male flowers or katkins, are produced from the side of the branches, growing upon separate plants from the female, which are succeeded by clusters of small berries, each having a single seed. It flowers in *July*, and the seeds ripen in autumn.

The leaves of this shrub has been by some persons gathered and used for tea, but it is generally supposed to be hurtful to the brain; but from this use of it, a learned physician a few years since, wrote a treatise to prove this

to be the true tea, in which he has only shewn his want of knowledge in these things.

It grows naturally in bogs, so cannot be made to thrive on dry land, for which reason it is seldom preserved in gardens.

The second sort grows naturally in *North America*, where the inhabitants get a sort of green wax from the berries which they make into candles. The method of collecting and preparing of this, is described by Mr. *Catesby*, in his *History of Carolina*.

This grows naturally on bogs and swampy lands, where it rises with many strong shrubby stalks seven or eight feet high, sending out several branches, which are garnished with stiff spear-shaped leaves, having scarce any foot-stalks, of a yellowish lucid green on their upper side, but paler on their under; these have a very grateful odour when bruised. The katkins come out upon different plants from the berries, these are about an inch long, standing erect. The female flowers come out on the side of the branches in longish bunches, which are succeeded by small roundish berries, covered with a sort of meal. This shrub delights in a moist soft soil, in which it thrives exceeding well, and lives in the open air without any protection.

The third sort grows naturally in *Carolina*; this doth not rise so high as the former, the branches are not so strong, and they have a grayish bark; the leaves are shorter, broader, and are sawed on their edges, but in other respects is like the second sort; the berries of this also is collected for the same purpose.

These sorts are propagated by seeds, which should be sown in the autumn, and then the plants will come up the following spring; but if the seeds are kept out of the ground till the spring, they seldom grow till the year after. These plants will require water in dry weather, and should be screened from frosts while young, but when they have obtained strength, they will resist the cold of this country very well in the open air.

The fourth sort grows naturally in *Philadelphia*, from whence many of the plants have been brought to *England*; and those which have been planted on a moist soil, have thriven very well; some of these creep at their roots, and send up suckers plentifully, in the same manner as in their native soil.

This rises with slender shrubby stalks near three feet high, which are hairy, and divide into several slender branches, which are garnished with leaves alternately indented almost to the midrib, and have a great resemblance to those of Spleenwort; they are of a dark green, hairy on their under side, and sit close to the stalks. The male flowers or katkins, come out on the side of the branches between the leaves, these are oval and stand erect. I have not seen any of these plants in fruit, so I can give no description of it.

This sort will propagate by suckers sent out from the roots, where it is planted in a loose moist soil, and endures the cold full as well as the two former sorts.

The fifth and sixth sorts grow naturally at the *Cape of Good Hope*; these only differ from each other, in one having very smooth shining leaves, and those of the other are hairy. I do not know if they are really different species, but as I received them from *Holland* as such, and the plants still retaining their difference, so I have enumerated them both.

These rise with shrubby slender stalks about four feet high, which divide into smaller branches, closely garnished with indented leaves; in one sort they are smooth and shining, and in the other they are hairy, and of a darker green; they sit close to the branches, and end in obtuse points which are indented: between the leaves come out some oval katkins

katkins which drop off, but the fruitful plants produce berries like the former sorts. These retain their leaves all the year, but are too tender to live through the winter in the open air in *England*, so must be placed in the green-house in winter. They are propagated by layers, but as they do not take root very freely, so the plants are not very common in *Europe* at present; for I do not find the cuttings of these plants will take root, having made several trials of them in all the different methods; nor have the *Dutch* gardeners had better success, so that the plants are as scarce there as in *England*.

When the layers are taken off from the old plants, they should be each put into a separate small pot, filled with soft, rich, loamy earth; and if they are placed under a common frame, shading them from the sun in the middle of the day, it will forward their taking new root; then they may be placed in a sheltered situation during the summer, and in the autumn removed into the green-house, and treated in the same way as other plants from the same country. The best season for laying down the branches, I have observed to be in *July*, and by the same time the following year, they have been fit to remove.

The seventh sort is a native of the *Cape of Good Hope*; this hath a weak shrubby stalk, which rises five or six feet high, sending out many long slender branches, which are closely garnished their whole length with small heart-shaped leaves, which sit close on the branches, and are slightly indented and waved on their edges. The flowers come out between the leaves in roundish bunches; these are male in all the plants I have yet seen; they have an uncertain number of stamina, and are all included in one common scaly involucre or cover. These flowers appear in *July*, but make no great appearance; the leaves of this sort continue all the year.

This is propagated in the same way as the two former sorts, and is difficult to increase, so is not common in the *European* gardens. It requires the same treatment as the two former sorts.

MYRRHIS. See *Chærophyllum*, *Scandix*, *Sison*.

MYRTUS. *Tourn. Inst. R. H.* 640. *tab.* 409. Myrtle.

The Characters are,

The empalement of the flower is of one leaf, cut into five points. The flower has five large oval petals which are inserted in the empalement, and a great number of small stamina which are also inserted in the empalement, terminated by small summits. The germen is situated under the flower, supporting a slender style, crowned by an obtuse stigma, which afterward turns to an oval berry with three cells, crowned by the empalement, each cell containing one or two kidney-shaped seeds.

The Species are,

1. MYRTUS *foliis ovatis, pedunculis longioribus*. Myrtle with oval leaves, and longer foot stalks to the flowers; or common broad-leaved Myrtle.

2. MYRTUS *foliis lanceolatis acuminatis*. Myrtle with spear-shaped acute-pointed leaves; or broad-leaved *Dutch* Myrtle.

3. MYRTUS *foliis lanceolato-ovatis acutis*. Myrtle with spear-shaped, oval, acute-pointed leaves.

4. MYRTUS *foliis ovato-lanceolatis confertis*. Myrtle with oval spear-shaped leaves growing in clusters; commonly called Orange-leaved Myrtle.

5. MYRTUS *foliis ovato-lanceolatis acutis, ramis erectioribus*. Myrtle with oval, acute-pointed, spear-shaped leaves, and erect branches; called upright Myrtle.

6. MYRTUS *foliis ovatis, baccis rotundioribus*. Myrtle with oval leaves and rounder berries; called the Box-leaved Myrtle.

7. MYRTUS *foliis lineari-lanceolatis acuminatis*. Myrtle with linear, spear-shaped, acute-pointed leaves; commonly called Rosemary-leaved Myrtle.

8. MYRTUS *pedunculis multifloris, foliis ovatis subpetiolatis*. *Lin. Sp. Plani.* 472. Myrtle with many flowers on each foot-stalk, and oval leaves having short foot-stalks.

The first sort is the common broad-leaved Myrtle, which is one of the hardiest kinds we have. The leaves of this are an inch and a half long, and one inch broad, of a lucid green, standing upon short foot-stalks. The flowers are larger than those of the other sorts, and come out from the side of the branches, on pretty long foot-stalks; these are succeeded by oval berries of a dark purple colour, inclosing three or four hard kidney-shaped seeds. It flowers in *July* and *August*, and the berries ripen in winter. This sort is by some called the flowering Myrtle, because it generally has a greater quantity of flowers, and those are larger than of any other sort.

The second sort has leaves much less than those of the former, and are more pointed, standing closer together on the branches. The flowers are smaller, and have shorter foot-stalks than those of the first sort; this flowers a little later in the summer, and seldom ripens its berries here.

The double flowering Myrtle I take to be a variety of this, for the leaves and growth of the plant, the size of the flowers, and the time of flowering, agree better with this than any of the other sorts.

The third sort grows naturally in the south of *France* and in *Italy*; the leaves of this are much smaller than those of the second, ending in acute points, of a dull green, and set pretty close on the branches. The flowers are smaller than either of the former, and come out from the wings of the leaves toward the end of the branches; the berries are small and oval.

The fourth sort hath a stronger stalk and branches than either of the former sorts, and rises to a greater height; the leaves are oval, spear-shaped, and are placed in clusters round the branches; these are of a dark green. The flowers are of a middling size, and come out sparingly from between the leaves; the berries are oval, and smaller than those of the first sort, but seldom ripen in *England*. The gardeners call this the Orange-leaved Myrtle, and by some it is stiled the Bay-leaved Myrtle. This sort is not so hardy as the former.

The fifth sort is the common *Italian* Myrtle; this hath oval spear-shaped leaves, ending in acute points; the branches of this grow more erect than those of either of the former sorts, as do also the leaves, from whence it is called by the gardeners upright Myrtle. The flowers of this sort are not large, and the petals are marked with purple at their points, while they remain closed; the berries are small, oval, and of a purple colour. There is a variety of this with white berries, in which it only differs from it; and I believe the Nutmeg Myrtle is only a variety of this, for I have raised several of the plants from seed, many of which were so like the *Italian* Myrtle, as not to be distinguished from it.

The sixth sort is commonly called the Box-leaved Myrtle; the leaves of this are oval, small, and sit close on the branches; they are of a lucid green, ending in obtuse points; the branches are weak, and frequently hang downward, when they are permitted to grow without shortening, and have a grayish bark. The flowers are small, and come late in the summer, the berries are small and round.

The seventh sort is called the Rosemary-leaved Myrtle, and by some it is called the Thyme-leaved Myrtle. The branches of this grow pretty erect; the leaves are placed close on the branches; they are small, narrow, and end in acute-points; they are of a lucid green, and have a fragrant odour when bruised. The flowers of this are small, and come late in the season, and are but seldom succeeded by berries here.

There are some other varieties of these Myrtles, which are propagated in the gardens for sale; but as their difference has been occasioned by culture, so it would be multiplying their titles to little purpose. Those which are here enumerated, I believe to be really distinct; for I have raised most of them from seeds, and have not found them change from one to another, though there has been other small variations among the plants.

The eighth sort is a native of the island of *Ceylon*; this is much tenderer than either of the former sorts, so cannot be kept through the winter in *England*, without some artificial heat. This hath a strong upright stalk, covered with a smooth gray bark, dividing upward into many slender stiff branches, garnished with oval leaves placed opposite, of a lucid green, and have very short foot-stalks. The flowers come out at the end of the branches, several of them being sustained upon one common foot-stalk, which branches out, and each flower stands on a very slender distinct foot-stalk; they are very like the flowers of *Italian Myrtle*, but always appear in *December* and *January*, and are never succeeded by berries here.

As there are several varieties of the common sorts of Myrtle cultivated in the gardens for sale, I shall just mention the titles by which they are known, that the curious may be informed how many there are:

Two sorts of Nutmeg Myrtles, one with a broader leaf than the other.

The Bird's Nest Myrtle, the Striped Nutmeg Myrtle, the Striped upright Myrtle, the Striped Rosemary-leaved Myrtle, the Striped Box-leaved Myrtle, and the Striped broad-leaved Myrtle.

These plants may all be propagated from cuttings, the best season for which is in the beginning of *July*, when you should make choice of some of the fraittest and most vigorous young shoots, which should be about six or eight inches long; and the leaves on the lower part must be stripped off about two or three inches high, and the part twisted which is to be placed in the ground; then having filled a parcel of pots (in proportion to the quantity of cuttings designed) with light rich earth, you should plant the cuttings therein, at about two inches distance from each other, observing to close the earth fast about them, and give them some water to settle it to the cuttings; then place the pots under a common hot-bed frame, plunging them either into some old dung, or tanners bark, which will prevent the earth from drying too fast; but you must carefully shade them with mats in the heat of the day, and give them air in proportion to the warmth of the season, not forgetting to water them every two or three days, as you shall find the earth in the pots require it. With this management, in about six weeks, the cuttings will be rooted, and begin to shoot, when you must inure them to the open air by degrees, into which they should be removed towards the latter end of *August*, or the beginning of *September*, placing them in a situation, where they may be sheltered from cold winds; in which place they may remain till the middle, or latter end of *October*, when the pots should be removed into the green-house, but should be placed in the coolest part thereof, that they may have air given to them, whenever the weather is mild, for they require only to be protected from severe cold, except the Orange-leaved, and the striped Nutmeg Myrtles, which are somewhat tenderer than the rest, and should have a warmer situation.

If these pots are placed under a common hot-bed frame in winter, where they may be screened from frost, and have the free air in mild weather, the young plants will succeed better than in a green-house, provided they do not receive too much wet, and are not kept closely covered, which will occasion their growing mouldy, and dropping their leaves.

The spring following these plants should be taken out of the pots very carefully, preserving a ball of earth to the roots of each of them, and every one should be placed into a separate small pot filled with rich light earth, observing to water them well to settle the earth to their roots, and place them under a frame until they have taken root, after which they should be inured to the open air, and in *May* they must be placed abroad for the summer, in a sheltered situation, where they may be defended from strong winds.

During the summer season, they will require to be plentifully watered, especially those in small pots, which in that season soon dry; therefore you should observe to place them where they should receive the morning sun; for when they are too much exposed to the sun in the heat of the day, the moisture contained in the earth of these small pots will soon be exhaled, and the plants greatly retarded in their growth thereby.

In *August* following you should shift them into pots a size larger, filling them up with the like rich earth, and observe to trim the roots which were matted to the side of the pots, as also to loosen the earth from the outside of the ball with your hands, some of which should be taken off, that the roots may the easier find passage into the fresh earth; then you must water them well, and place the pots in a situation where they may be defended from strong winds; and at this time you may trim the plants, in order to reduce them to a regular figure; such of them as are inclinable to make crooked stems, you should thrust down a slender strait stick, close by them, to which their stems should be fastened, so as to bring them upright.

If care be taken to train them thus while they are young, the stems afterward, when they have acquired strength, will continue strait without any support, and their branches may be pruned, so as to form either balls or pyramids, which for such plants as are preserved in the green-house, and require to be kept in small compass, is the best method to have them handsome; but then these sheered plants will not produce flowers, for which reason that sort with double flowers should not be clipped, because the chief beauty of that consists in its flowers; but it will be necessary to suffer a plant or two of each kind to grow rude, for the use of their branches in nosegays, &c. for it will greatly deface those which have been constantly sheered to cut off their branches.

As these plants advance in stature, they should annually be removed into larger pots, according to the size of their roots; but you must be careful not to put them into pots too large, which will cause them to shoot weak, and many times prove the destruction of them; therefore when they are taken out of the former pots, the earth about their roots should be pared off, and that within side the ball must be gently loosened, that the roots may not be closely confined; and then place them into the same pots again, provided they are not too small, filling up the sides and bottom of them with fresh rich earth, and giving them plenty of water to settle the earth to their roots, which should be frequently repeated, for they require to be often watered both in winter and summer, but in hot weather they must have it in plenty.

The best season for shifting these plants is either in *April* or *August*, for if it be done much sooner in the spring, the plants are then in a slow growing state, and so not capable to strike out fresh roots again very soon; and if it be done later in autumn, the cold weather coming on will prevent their taking root; nor is it advisable to do it in the great heat of summer, because they will require to be very often watered, and also to be placed in the shade, otherwise they will be liable to droop for a considerable time; and that being the season when these plants should be placed amongst

other exoticks, to adorn the several parts of the garden, these plants, being then removed, could not be exposed until they have taken root again, which, at that time (if the season be hot and dry) will be three weeks, or a month.

In *October*, when the nights begin to be frosty, you should remove the plants into the green-house; but if the weather proves favourable in autumn (as it often happens), they may remain abroad until the beginning of *November*, for if they are carried into the green-house too soon, and the autumn should prove warm, they will make fresh shoots at that season, which will be weak, and often grow mouldy in winter, if the weather should be so severe, as to require the windows to be kept closely shut, whereby they will be greatly defaced; for which reason they should always be kept as long abroad as the season will permit, and removed out again in the spring, before they begin to shoot out; and during the winter season that they are in the green-house, they should have as much free air as possible when the weather is mild.

The three first mentioned sorts I have planted abroad in warm situations, upon a dry soil, where they have endured the cold of our winters for several years very well, with only being covered in very hard frosts with two or three mats, and the surface of the ground about their roots covered with a little mulch to prevent the frost from entering the ground; but in *Cornwall* and *Devonshire*, where the winters are more favourable than in most other parts of *England*, there are large hedges of Myrtle, which have been planted several years, and are very thriving and vigorous, some of which are upward of six feet high; and I believe, if the double flowering kind were planted abroad, it would endure the cold as well as any of the others, it being a native of the southern parts of *France*. This, and the Orange-leaved kind, are the most difficult to take root from cuttings; but if they are planted toward the latter end of *June*, making choice of only such shoots as are tender, and the pots are plunged into an old bed of tanners bark which has lost most of its heat, and the glasses shaded every day, they will take root extremely well, as I have more than once experienced. The Orange-leaved sort, and those with variegated leaves, are somewhat tenderer than the ordinary sorts, and should be housed a little sooner in autumn, and placed farther from the windows of the green-house.

The eighth sort is at present rare in *Europe*, and in very few gardens. This was by *Dr. Linnæus* separated from the Myrtles in the former editions of his works, and had the title of *Myrsine* applied to it; but in his *Species of Plants*, he has joined it to this genus again, to which, according to his system, it properly belongs; for the number of petals, stamina, and style, do agree with those of the Myrtle, but it differs in fructification, this having but one seed in each fruit, and the Myrtle has four or five.

This plant is with difficulty propagated, which occasions its present scarcity, for as it does not produce ripe seeds in *Europe*, it can only be increased by layers or cuttings. By the former method the layers are commonly two years before they take root, and the cuttings frequently fail, though the latter is preferred, when performed at a proper season, and in a right method; the best time to plant the cuttings is in *May*; in the choice of them, it should be the shoots of the former year, with a small piece of the two years wood at bottom; these should be planted in a soft loamy earth, and covered with bell or hand-glasses to exclude the air; which will be of great service to promote the cuttings putting out roots, and if they are covered with the glasses of the hot-bed above them, it will be yet better: the cuttings should be shaded from the sun, in the heat of the day, and gently refreshed with water, but they should by no means have the glasses moved; so the water given to them must be over the whole, which will soak in and moisten the earth under the glasses; in about five or six weeks they will have taken root, when they should be gradually inured to bear the open air, into which it will be proper to remove them about the middle of *July*, that they may be strengthened before winter. In *August* they should be carefully taken up, and each planted in a small pot filled with light earth from a kitchen garden, and placed in a shady situation till they have taken fresh root; then they should be placed in a sheltered situation, where they may remain till the end of *September*, and then be removed into the stove.

This plant will not live through the winter in *England* in a green-house, but if it is placed in a moderate degree of warmth, it will flower well in winter; and in *July*, *August*, and *September*, the plants should be placed abroad in a sheltered situation.

MYRTUS BRABANTICA. See *Myrica*.

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NAPELLUS. See *Aconitum*.
NAPUS. See *Brassica* and *Rapa*.
NAPÆA. *Lin. Gen. Plant.* 748.

The Characters are,

It hath male and hermaphrodite flowers in distinct plants. The male flowers have pitcher-shaped empalements of one leaf. The flowers have five oblong petals, which are connected at their base; they have many hairy stamina, which are joined at the bottom into a sort of cylindrical column. The hermaphrodite flowers have the like empalement, petals, and stamina, as the

N A P

male, and have a conical germen, supporting a cylindrical style, divided at the top into ten parts, crowned by single stigmas. The germen afterward turns to an oval fruit, inclosed in the empalement, divided into ten cells, each containing one kidney-shaped seed.

The Species are,

1. NAPÆA *pedunculis involucreatis angulatis, foliis scabris floribus dioicis.* *Lin. Sp.* *Napæa* with angular foot-stalks, rough leaves, and male flowers upon different plants from the fruitful.

2. NAPÆA

2. *NAPÆA foliis trilobatis, lobis acuminatis inæqualiter serratis, pedunculis nudis trifloris.* Napæa with leaves having three acute-pointed lobes, which are unequally sawed, and naked foot-stalks with three flowers.

Both sorts have perennial roots, which are composed of many thick fleshy fibres, which strike deep into the ground, and are connected at the top into large heads; the leaves of the first sort are rough, hairy, and are deeply cut into six or seven lobes, which are irregularly indented on their edges, each lobe having a strong midrib, which all meet in a center at the foot-stalk. The foot-stalks are large and long, arising immediately from the root, and spread out on every side. The stalks rise seven or eight feet high, and divide into smaller branches; they are hairy, and garnished at each joint with one leaf, of the same form as those below, but diminish in their size toward the top, where they seldom have more than three lobes; at the upper part of the stalk, come out from the side at each joint, a long foot-stalk, sustaining several white flowers, which are tubulous at bottom, where the segments of the petal are connected, but they spread open above, and are divided into five obtuse segments; in the center arises the column, to which their stamina are joined at their base, but spread open above, and in the hermaphrodite flowers the style is connected to the same column. The hermaphrodite flowers are succeeded by compressed orbicular fruit, inclosed in the empalement, and divided into ten cells, each containing a kidney-shaped seed, but the male plants are barren. It flowers in *July*, and the seeds ripen in autumn, soon after which the stalks decay, but the roots will live many years.

The roots of the second sort frequently creep in the ground, to some distance from the old plant; the stalks rise about four feet high, and are garnished with smooth leaves, placed alternately, standing upon long slender foot-stalks; they are deeply cut into three lobes, which end in acute points, and are irregularly sawed on their edges. At the base of the leaf comes out the foot-stalk of the flower, which is about three inches long, dividing at the top into three smaller, each sustaining one white flower of the same form with those of the first sort, but are smaller, and the column of stamina is longer, their summits standing out beyond the petal; these plants have some male and hermaphrodite flowers on the same plants.

Both these plants grow naturally in *Virginia*, and other parts of *North America*; from the bark of these plants might be procured a sort of hemp, which many of the malvaceous tribe afford; and in some of the sorts which grow naturally in *India*, the fibres of the bark are so fine, as to spin into very fine threads, of which there might be woven very fine cloth.

These plants are easily propagated by seeds, which, if sown on a bed of common earth in the spring, the plants will rise very freely, and will require no other care, but to keep them clear from weeds till autumn, when they may be transplanted into the places where they are to remain; they delight in a rich moist soil, in which they will grow very luxuriantly, so they must be allowed room. The second sort may be propagated by its creeping roots, which may be parted in autumn; but as these plants have no great beauty, so one or two of each sort in a garden, for the sake of variety, will be enough.

NARCISSO LEUCOIUM. See *Galanthus*.

NARCISSUS. *Tourn. Inst. R. H.* 353. *tab.* 185. The Daffodil.

The Characters are,

The flowers are included in an oblong compressed spathe (or sheath), which tears open on the side, and withers. The

flowers have a cylindrical funnel shaped empalement of one leaf, which is spread open at the brim; they have six oval petals on the outside of the nectarium, which are inserted above their base, and six awl-shaped stamina fixed to the tube of the nectarium, terminated by oblong summits; they have a three-cornered, roundish, obtuse germen, situated below the flower, which afterward turns to an obtuse, roundish, three-cornered capsule, with three cells filled with globular seeds.

The Species are,

1. *NARCISSUS spathâ uniflorâ, nectarii limbo campanulato erecto, petalo æquale.* *Lin. Sp. Plant.* 289. Daffodil with one flower in each sheath, whose nectarium is erect, bell-shaped, and equal with the petals; or common *English Daffodil*.

2. *NARCISSUS spathâ uniflorâ, nectarii limbo rotato brevissimo.* *Hort. Upsal.* 74. Daffodil with one flower in a sheath, having a very short wheel-shaped nectarium.

3. *NARCISSUS spathâ uniflorâ, nectarii limbo campanulato erecto, petalo dimidio brevior.* Daffodil with one flower in a sheath, having an erect bell-shaped empalement, half the length of the petal; or the *Incomparable Daffodil*.

4. *NARCISSUS spathâ biflorâ, nectarii campanulato, brevissimo, floribus nutantibus.* Daffodil with two flowers in a sheath, a short bell-shaped nectarium, and nodding flowers; called *Primrose Peerless*.

5. *NARCISSUS spathâ uniflorâ, nectario campanulato brevissimo, petalis reflexis.* Daffodil with one flower in a sheath, having a very short bell-shaped nectarium, and reflexed petals.

6. *NARCISSUS spathâ uniflorâ, nectario turbinato maximo, genitalibus declinatis.* *Lin. Sp. Plant.* 289. Daffodil with one flower in a sheath, having a very large turbinated nectarium, and declined stamina; commonly called the *Hoop Petticoat Narcissus*.

7. *NARCISSUS spathâ uniflorâ, nectario brevissimo sexpartito.* *Læf. Lin. Sp. Plant.* 290. Daffodil with one flower in a sheath, having a very short nectarium, which is cut into six parts; or small autumnal Daffodil.

8. *NARCISSUS spathâ multiflorâ, nectario campanulato, foliis planis.* *Hort. Upsal.* 74. Daffodil with many flowers in a sheath, having a bell-shaped nectarium, and plain leaves; commonly called *Polyanthus Narcissus*.

9. *NARCISSUS spathâ multiflorâ, nectario campanulato brevi, foliis subulatis.* *Hort. Upsal.* 75. Daffodil with many flowers in a sheath, a short bell-shaped nectarium, and awl-shaped leaves; called *Jonquil*.

The sorts here enumerated, are all the real species which I have met with in the *English* gardens, though there is a great variety of each species, which differ so much from one another, as to render it very difficult to ascertain the species to which they belong; in order to find out as well as I could, from what species many of those varieties have been raised, I endeavoured to degenerate as many of the double flowering, and others of the best kinds, so far as I could, by which I have observed several changes, and shall here mention, under each species, the varieties I have observed.

The first sort is the common *English Daffodil*, which grows naturally by the borders of woods, and fields, in many parts of *England*; this hath a large bulbous root, from which comes out five or six flat leaves, about a foot long, and an inch broad, of a grayish colour, a little hollowed in the middle, like the keel of a boat. The stalk rises a foot and a half high, having two sharp longitudinal angles; at the top comes out a single flower, inclosed in a thin spathe (or sheath), which is torn open on one side, to make way for the flower to come out, and then withers and remains on the top of the stalk. The flower is of one petal, or

leaf, being connected at the base, but is cut into six parts almost to the bottom, which expand; in the middle of this is situated a bell-shaped nectarium, called by the gardeners a cup, which is equal in length to the petal, and stands erect. The flower nods on one side the stalk. The petal is of a pale brimstone colour, and the nectarium yellow. It flowers the beginning of *April*, and after the flowers are past, the germen turns to a roundish capsule, with three cells, filled with roundish black seeds, which ripen in *July*. This sort propagates very fast by offsets from the root.

The *Varieties* of this are,

One with white petals, and a pale yellow colour.

One with yellow petals, and a golden cup.

The common, double, yellow Daffodil.

Another double Daffodil with three or four cups within each other.

And, I believe, *John Tradescant's* Daffodil may be referred to this species.

The second sort grows naturally in the south of *France*, and in *Italy*; this has a smaller and rounder bulbous root than the former. The leaves are longer, narrower, and flatter than those of that sort. The stalks do not rise higher than the leaves, which are of a gray colour; at the top of the stalk comes out one flower from the sheath, which nods on one side. The petal of this is cut into six segments, which are rounded at their points; they are of a snow white, and spread open flat. In the center is situated a very short nectarium or cup, which is fringed on the border with a bright purple circle. The flowers have an agreeable odour. This flowers in *May*, but seldom produces seeds, however it increases fast enough by offsets.

The double white Narcissus is the only variety of this which I have observed, though there is mentioned in some books several other.

The third sort grows naturally in *Spain* and *Portugal*, from whence I have received the roots. The bulbs of this sort are very like those of the first. The leaves are longer, of a darker green, and the flower-stalks rise higher. The segments of the petal are rounder, and spread open, flatter than those of the first sort. The nectarium or cup, in the middle, is about half the length of the petal, and is edged with a gold-coloured fringe. It flowers in *April*, but seldom produces seeds here. This sort sports and varies more than any of the other: the following variations I have traced in the same roots.

The roots of these, the first year, produced very double flowers, of the sort which is commonly called the Incomparable Daffodil. The six outer segments of the petal were longer than either of the others, and white; the middle was very full of shorter petals, some of which were white, others yellow, and collected into a globular figure: some of these roots, the following year, produced flowers less double than before, with no white petals in them, but the larger petals were of a sulphur colour, and the others yellow; from this they afterward degenerated to half double flowers, and at last to single flowers, with a cup half the length of the petal, in which manner they have continued to flower many years; so that we may conclude, that those varieties were first obtained from the seeds of this single flower.

The fourth sort grows naturally in the south of *France* and in *Italy*, and has been found growing in the fields in some parts of *England*, but it is likely to have been from some roots which have been thrown out of gardens with rubbish. The roots of this sort are not so large as those of the first, and are rounder; the leaves are long, of a gray colour, and smoother than those of the first; the flower-stalks are of the same length with the leaves, and have commonly but one flower in a sheath, but sometimes when

the roots are strong they have two. The flower nods downward, the segments of the petal are a little waved on their edges, the nectarium or cup is short, and bordered with yellow; it flowers in *May*. The scent of these flowers is not very agreeable, and as they are not very beautiful, so they are seldom cultivated in gardens, since the finer sorts have been plenty. There is no variety of this, so far as I have been able to trace, for I could never observe any variation in their flowers.

The fifth sort has some resemblance of the fourth, but the flowers are whiter; the segments of the petal are reflexed, and the border of the nectarium or cup is of a gold yellow colour; this has some affinity to the second sort.

The sixth sort grows naturally in *Portugal*, from whence I have received the roots. The bulbs of this kind are small, the leaves are very narrow, having some resemblance to those of the Rush, but are a little compressed, and have a longitudinal furrow on one side; these are seldom more than eight or nine inches long. The flower-stalk is slender, taper, and about six inches long, sustaining at the top one flower, which is at first inclosed in a sheath; the petal is scarce half an inch long, and is cut into six acute segments; the nectarium or cup is more than two inches long, very broad at the brim, lessening gradually to the base, being somewhat formed like the ladies hoop-petticoats, from whence the flower is so called. It flowers in *April*, but does not produce seeds here. There are no varieties of this sort.

The seventh sort grows naturally in *Spain*. This hath a small bulbous root; the leaves are but few in number, and are narrow; the stalk is jointed, and rises about nine inches high, sustaining at the top one flower, which at first is inclosed in the spatha (or sheath); the flower is cut into six narrow segments, which are white; the nectarium or cup is yellow. It flowers late in the autumn, and the roots are tender, so are often killed by hard frosts in *England*, which renders it scarce here.

The eighth sort grows naturally in *Portugal*, and in the islands of the *Archipelago*; of this there are a greater variety than of all the other species, for as the flowers are very ornamental, and come early in the spring, so the florists in *Holland*, *Flanders*, and *France*, have taken great pains in cultivating and improving them; so that at present the catalogues printed by the *Dutch* florists, contain more than thirty varieties, the principal of which are these hereafter mentioned.

These have yellow petals, with Orange, yellow, or sulphur-coloured cups or nectariums.

The Great Algiers.	The Most Beautiful.
The Ladies Nofegay.	The Golden Star.
The Greater Bell.	The Mignon.
The Golden Royal.	The Zeylander.
The Golden Scepter.	The Madouse.
The Triumphant.	The Golden Sun.

The following have white petals, with yellow or sulphur-coloured cups or nectariums.

The Archdutchefs.	The Greater Bozelman.
The Triumphant Nofegay.	The Czarina.
The New Dorothy.	The Grand Monarque.
The Passe Bozelman.	The Czar of Muscovy.
The Superb.	The Surpassante.

There are some with white petals and white cups, but these are not so much esteemed as the others, though there are two or three varieties with large bunches of small white flowers, which have a very agreeable odour, so are as valuable as any of the other, and comes later to flower than most

most of the other sorts. There is also one with very double flowers, whose outer petals are white, and those in the middle are some white, and others are of an Orange colour, which have a very agreeable scent, and is the earliest in flowering; it is generally called the *Cyprus Narcissus*, and seems to be a distinct species from the others. This, like most other double flowers, never produces any seeds, so is only propagated by offsets, and is the most beautiful of all the *Narcissuses*, when blown upon glasses of water in a room; but when it is planted in the ground, if the bed in which they are planted is not covered with mats in frosty weather, to prevent their flower-buds from being destroyed, they seldom flower; for the leaves begin to shoot early in the autumn, and the flower-buds appear about *Christmas*, which are tender; so that if hard frost happen when they are coming out of the ground, it generally kills them; but if they are properly screened from frost, they will flower in *February*, and in mild seasons often in *January*.

The ninth sort is the *Jonquil*, a flower so well known as to need no description; of this there is the great and small *Jonquil* with single flowers, and the common sort with double flowers, which is most esteemed.

I shall first treat of the method for raising of the fine sorts of *Polyanthus Narcissus* from seeds, which is the way to obtain new varieties.

The not practising this has occasioned our sending abroad annually for great quantities of flower-roots, which were for many years kept up to a high price, on account of the great demand for them in *England*; whereas, if we were as industrious to propagate them as our neighbours, we might soon vie with them, if not outdo them, in most sorts of flowers, as may be seen, by the vast variety of *Carnations*, *Auriculas*, *Rununculas*, &c. which have been produced from seeds in *England* within a few years past, and exceed most of those kinds in any part of *Europe*.

You must first be very careful in saving your seeds, to gather none but from such flowers as have good properties, and particularly from such only as have many flowers upon a stalk, that flower tall, and have beautiful cups to their flowers; from such you may expect to have good flowers produced, provided the roots are not intermixed with ordinary kinds, which by the mixing of the farina will greatly degenerate the best sort of flowers; and if you sow ordinary seed, it is only putting yourself to trouble and expence to no purpose, since from such seeds there can be no hopes of procuring any valuable flowers.

Having provided yourself with good seeds, you must procure either some shallow cases or flat pans, made on purpose for the raising of seedlings, which should have holes in their bottoms, to let the moisture pass off; these must be filled with fresh light earth about the beginning of *August* (this being the season for sowing the seeds of most bulbous-rooted flowers); the earth in these must be levelled very even; then sow the seeds thereon pretty thick, covering them over with fine, sifted, light earth, about half an inch thick, and place the cases or pans in a situation where they may have only the morning sun till about ten o'clock, where they should remain until the beginning of *October*, when they must be removed into a warmer situation, placing them upon bricks, that the air may freely pass under the cases, which will preserve them from being too moist.

They should also be exposed to the full sun in winter, but screened from the north and east winds; and if the frost should be severe, they must be covered either with mats, *Peas haulm*, or some light covering, otherwise there will be danger of their being destroyed: in this situation they may remain until the beginning of *April*, by which time the plants will be up, when you must carefully clear them from weeds; and if the season should prove dry, they must

be frequently watered: the cases should also now be removed into their former shady position, or shaded in the middle of the day, for the heat of the noon-day sun will be too great for the young plants.

The latter end of *June*, when the leaves of the plants are decayed, you should take off the upper surface of the earth in the cases (which by that time will have contracted a mossiness, and, if suffered to remain, will greatly injure the young roots), observing not to take it so deep as to touch the roots; then sift some fresh light earth over the surface, about half an inch thick, which will greatly strengthen the roots; the same should also be repeated in *October*, when the cases are moved again into the sun.

During the summer season, if the weather should prove very wet, and the earth in the case appear very moist, you must remove them into the sun till the earth be dry again; for if the roots receive much wet, during the time they are unactive, it very often rots them while young; therefore you must never give them any water after their leaves are decayed, but only place them in the shade, as was before directed.

Thus you should manage them the two first seasons, till their leaves are decayed the second summer after sowing; when their leaves are decayed you should carefully take up the roots, which may be done by sifting the earth in the cases through a fine sieve, whereby the roots will be easily separated from the earth; then having prepared a bed of good, fresh, light earth, in proportion to the quantity of your roots, you should plant them therein, at about three inches distance every way, and about three inches deep in the ground.

These beds should be raised above the level of the ground, in proportion to the moisture of the soil, which if dry, three inches will be enough; but if it be wet, they must be raised six or eight inches high, and laid a little rounding, to shoot off the wet.

If these beds are made in *August*, which is the best time to transplant the roots, the weeds will soon appear very thick; therefore you should clean the surface of the ground to destroy them, being very careful not to disturb any of the roots; and this should be repeated as often as may be found necessary, by the growth of the weeds, observing always to do it in dry weather, that they may be effectually destroyed; and toward the latter end of *October*, after having entirely cleared the beds from weeds, you should sift a little rich light earth over them, about an inch thick; the goodness of which will be washed down to the roots by the winter's rain, which will greatly encourage their shooting in the spring.

If the cold should be very severe in winter, you should cover the beds, either with old tan or sea-coal ashes, or in want of these with *Peas haulm*, or some such light covering, to prevent the frost from penetrating the ground to the roots, which might greatly injure them while they are so young.

In the spring, when the plants begin to appear above ground, you must gently stir the surface of the ground, clearing it from weeds, &c. in doing of which, you should be very careful not to injure the roots; and if the season should prove dry, you should now and then gently refresh them with water, which will strengthen them.

When their leaves are decayed, you should clear the beds from weeds, and sift a little earth over them (as was before directed, which must also be repeated in *October* in like manner; but the roots should not remain longer in these beds than two years, by which time they will have grown so large as to require more room, therefore they should be taken up as soon as their leaves are decayed, and planted into fresh beds, which should be dug deep, and a little very rotten

ro ten dung buried in the bottom, for the fibres of the roots to strike into. Then the roots should be planted at six inches distance, and the same depth in the ground. In the autumn, before the frost comes on, if some rotten tan is laid over the beds, it will keep out the frost, and greatly encourage the roots; and if the winter should prove severe, it will be proper to lay a greater thickness of tan over the beds, and also in the alleys, to keep out frost, or to cover them over with Straw or Peas haulm, otherwise they may be all destroyed by the cold. In the spring these coverings should be removed, as soon as the danger of hard frosts is over, and the beds must be kept clean from weeds the following summer: at *Michaelmas* they should have some fresh earth laid over the beds, and covered again with tan; and so every year continued till the roots flower, which is generally in five years from seed, when you should mark all such as promise well, which should be taken up as soon as their leaves decay, and planted at a greater distance in new prepared beds; but those which do not flower, or those you do not greatly esteem, should be permitted to remain in the same bed; therefore, in taking up those roots which you marked, you must be careful not to disturb the roots of those left, and also to level the earth again, and fit some fresh earth over the beds (as before) to encourage the roots; for it often happens in the seedlings of these flowers, that at their first time of blowing, their flowers seldom appear half so beautiful as they do the second year; for which reason none of them should be rejected until they have flowered twice, that so you may be assured of their worth.

Thus having laid down directions for the sowing and managing these roots, until they are strong enough to flower, I shall proceed to give some instructions for planting and managing the roots afterwards, so as to cause them to produce large fair flowers.

All the sorts of Narcissus, which produce many flowers upon a stalk, should have a situation defended from cold and strong winds, otherwise they will be subject to be injured by the cold in a severe winter, and their stems broken down when in flower; for notwithstanding their stalks are generally pretty strong, yet the number of flowers upon each renders their heads weighty, especially after rain, which lodges in the flowers, and, if succeeded by strong winds, very often destroys their beauty, if they are exposed thereto; so that a border under a hedge, which is open to the south-east, is preferable to any other position for these flowers.

The morning sun rising upon them, will dry off the moisture which had lodged upon them the preceding night, and cause them to expand fairer than when they are planted in a shady situation; and if they are too much exposed to the afternoon sun, they will be hurried out of their beauty very soon; and the strong winds usually coming from the west and south-west points, they will be exposed to the fury of them, which is frequently very injurious to them.

Having made choice of a proper situation, you must then proceed to prepare the earth necessary to plant them in; for if the natural soil of the place be very strong or poor, it will be proper to make the border of new earth, removing the former soil away about three feet deep. The best earth for these flowers is a fresh light Hazel loam, mixed with a little very rotten neats dung: this should be well mixed together, and often turned over, in order to sweeten it; then having removed away the old earth to the fore-mentioned depth, you should put a layer of rotten dung or tan, in the bottom, about four or five inches thick, upon which you must lay some of the prepared earth about eighteen or twenty inches thick, making it exactly level; then having marked out by line the exact distances at which the roots are to be planted (which should not be less than six or eight inches square), you must place the roots accordingly, ob-

serving to set them upright; then you must cover them over with the before-mentioned earth about eight inches deep, being very careful in doing of it, not to displace the roots: when this is done, you must make the surface of the border even, and make up the side strait, which will appear handsome.

The best time for planting these roots is in *September*, for if they are kept too long out of the ground, it will cause their flowers to be very weak. You should also observe the nature of the soil where they are planted, and whether the situation be wet or dry, according to which you should adapt the fresh earth, and order the beds; for if the soil be very strong, and the situation moist, you should then make choice of a light earth, and raise the beds six or eight inches, or a foot, above the level of the ground, otherwise the roots will be in danger of perishing by too much wet; but if the situation be dry, and the soil naturally light, you should then allow the earth to be a little stronger, and the beds should not be raised above three or four inches high; for if they are made too high, the roots will suffer very much, if the spring should prove dry, nor would the flowers be near so fair. As also in very severe winters, those beds which are raised much above the level of the ground, will be more exposed to the cold than those which are lower, unless the alleys are filled up with rotten tan or litter.

During the summer, the only culture these flowers require is, to keep them free from weeds; and when their leaves are entirely decayed, they should be raked off, and the beds made clean, but by no means cut off their leaves till they are quite decayed, as is by some practised, for that greatly weakens the roots.

Toward the middle of *October*, if the weeds have grown upon the beds, you should in a dry day gently hoe the surface of the ground to destroy them, observing to rake it over smooth again; and before the frosts come on, the beds should be covered over two inches thick with rotten tan, to keep out the frost; after which they will require no farther care till the spring, when their leaves will appear above ground; at which time you should gently stir the surface of the earth with a small trowel, being very careful not to injure the leaves of the plants, and rake it smooth with your hands, clearing off all weeds, &c. which, if suffered to remain at that season, will soon grow so fast, as to appear unsightly, and will exhaust the nourishment from the earth. With this management these roots will flower very strong, some of which will appear in *March*, and the others in *April*, which, if suffered to remain, will continue in beauty a full month, and are, at that season, very great ornaments to a flower-garden.

After the flowers are past and the leaves decayed, you should stir the surface of the ground, to prevent the weeds from growing; and if at the same time you lay a little very rotten dung over the surface of the beds, the rain will wash down the salts thereof, which will greatly encourage the roots the succeeding year.

During the summer season they will require no farther care, but to keep them clear from weeds till *October*, when the surface of the beds should be again stirred, raking off all weeds, &c. and laying some good fresh earth over the beds about an inch deep, which will make good the loss sustained by weeding, &c. and in the spring you must manage as was directed for the preceding year.

These roots should not be transplanted oftener than every third year, if they are expected to flower strong and make a great increase, because the first year after removing they never flower so strong as they do the second and third; nor will the roots increase so fast, when they are often transplanted; but if you let them remain longer than three years unremoved, the number of offsets, which by that time will

will be produced, will weaken the large bulbs, and cause them to produce very weak flowers; therefore, at the time of transplanting them, all the small offsets should be taken off, and planted in a nursery-bed by themselves, but the large bulbs may be planted again for flowering. If you plant them in the same bed where they grew before, you must take out all the earth two feet deep, and fill it up again with fresh, in the manner before directed, which will be equal to removing them into another place: this is the constant practice of the gardeners in *Holland*, who have but little room to change their roots; therefore they every year remove the earth of their beds and put in fresh, so that the same place is constantly occupied by the like flowers. But those people take up their roots every year, for as they cultivate them for sale, the rounder their roots are, the more valuable they will be: the way to have them so is, to take their offsets from them annually, for when the roots are left two or three years unremoved, the offsets will have grown large, and these pressing against each other, will cause their sides to be flatted; so that where the roots are propagated for sale, they should be annually taken up as soon as their leaves decay, and the large bulbs may be kept out of the ground till the middle or end of *October*, but the offsets should be planted the beginning of *September* or sooner, that they may get strength, so as to become blowing roots the following year; but where they are designed for ornament, they should not be removed oftener than every third year, for then the roots will be in large bunches, and a number of stalks with flowers coming from each bunch, they will make a much better appearance than where a single stalk rises from each root, which will be the case when the roots are annually removed.

The common sorts of *Daffodil* are generally planted in large borders of the pleasure-garden, where, being intermixed with other bulbous-rooted flowers, they afford an agreeable variety in their seasons of flowering. These roots are very hardy, and will thrive in almost any soil or situation, which renders them very proper for rural gardens, where, being planted under the shade of trees, they will thrive for several years without transplanting, and produce annually in the spring great quantities of flowers, which will make a good appearance before the trees come out in leaf.

The *Jonquils* should be planted in beds or borders, separate from other roots, because these require to be transplanted at least every year, otherwise their roots are apt to grow long and slender, and seldom flower well after, which is also the case, if they are continued many years in the same soil; wherefore the roots should be often removed from one part of the garden to another, or at least the earth should be often renewed, which is the most probable method to preserve these flowers in perfection.

The soil in which these flowers succeed best, is an *Hazel loam*, neither too light nor over stiff; it must be fresh, and free from roots of trees or noxious weeds, but should not be dunged; for it is very remarkable, that where the ground is made rich, they seldom continue good very long, but are subject to shoot downwards, and form long slender roots.

These flowers are greatly esteemed by many people for their strong sweet scent, though there be very few ladies that can bear the smell of them; so powerful is it, that many times it overcomes their spirits, especially if confined in a room; for which reason, they should never be planted too close to a habitation, lest they become offensive, nor should the flowers be placed in such rooms where company is entertained.

NASTURTIUM. *Tourn. Inst. R. H.* 213. tab. 102. Crefs.

The Characters are,

The flower hath a four-leaved empalement. It has four petals

placed like a cross, and six awl-shaped stamina, four of which are the same length of the empalement, and two are shorter. In the center is situated a heart shaped germen, which afterward turns to a heart-shaped short capsule, with acute borders, having two cells, each containing one or two oval seeds.

The Species are,

1. *NASTURTIUM foliis oblongis multifidis, caule erecto*. Crefs with oblong leaves ending in many points, and an erect stalk; or common Garden Crefs.

2. *NASTURTIUM foliis radicalibus incis, caulinis oblongis integerrimis, caule erecto ramoso*. Crefs with lower leaves divided, but those on the stalks oblong and entire, and an erect branching stalk; or broad-leaved Garden Crefs.

3. *NASTURTIUM foliis pinnatifidis, caulibus procumbentibus*. Crefs with leaves ending in many points, and trailing stalks; Swines Crefs.

There are some other species of this genus, but as they are seldom cultivated in gardens, so I shall not enumerate them here.

The common Crefs is a plant so well known, as to need no description; there is a variety of this, whose lower leaves are much curled on their edges; this was formerly cultivated in greater plenty than at present. Whether this is a distinct species, or only a variety, I cannot determine, though for some years I found it retained its difference.

The broad-leaved sort, I think, is a distinct plant; the lower leaves are very broad, and cut into three or five lobes. The stalks rise much higher, and branch out more than those of the common sort, and the branches grow more upright; this was formerly more cultivated than at present.

The first sort is commonly cultivated in gardens as a salad herb, and is chiefly esteemed in the winter and spring, it being one of the warm kind. During the winter season, it must be sown upon a gentle hot-bed, and covered with either mats or glasses, to preserve it from great rains or frost, both which are equally destructive at that season: in the spring it may be sown in warm borders, where, if it be defended from cold winds, it will thrive very well; but if you would continue it in summer, you must sow it upon shady borders, and repeat sowing every third day, otherwise it will be too large for use, for at that season it grows very fast.

The curled sort is preserved in some gardens for curiosity sake, and to garnish dishes, but the common sort is equally as good for use. This should be sown somewhat thinner than the common sort, and when the plants come up, they should be drawn out, so as to leave the remaining ones half an inch asunder, whereby they will have room to expand their leaves.

In order to preserve the variety with curled leaves distinct, you must carefully separate all such plants as appear inclined to degenerate from their kinds, leaving only such as have their leaves very much curled, being very careful not to intermix them together. When the seeds are ripe, the plants should be drawn up, and spread upon a cloth two or three days to dry; after which the seeds should be beaten out, and preserved in a dry place for use.

NASTURTIUM INDICUM. See *Tropæolum*.

NECTARINE [properly so called of *Nectar*, the poetical drink of the gods] *Nectarine*.

This fruit should have been placed under the article of *PEACHES*, to which it properly belongs, differing from them in nothing more than in having a smooth rind, and the flesh being firmer. These the *French* distinguish by the name of *Brugnon*, as they do those Peaches which adhere to the stone, by the name of *Pavies*, retaining the name of *Pêche* to only such as part from the stone; but since the writers in gardening have distinguished this fruit by the name of *Nectarine* from the Peaches, so I shall follow their example, lest by endeavouring to rectify their mistakes, I should

render

render myself less intelligible to the reader. I shall therefore mention the several varieties of this fruit which come to my knowledge :

1. *Fairchild's Early Nectarine*. This is one of the earliest ripe Nectarines we have ; it is a small round fruit, about the size of the Nutmeg Peach, of a beautiful red colour, and well flavoured ; it ripens the end of *July*.

2. *Etruge Nectarine*. The tree has sawed leaves ; the flowers are small ; it is a middle-sized fruit, of a dark red or purple colour next the sun, but of a pale yellow or greenish colour towards the wall ; it parts from the stone, and has a soft melting juice : this ripens in the beginning of *August*.

3. *Newington Nectarine*. The tree has sawed leaves ; the flowers are large and open ; it is a fair large fruit (when planted on a good soil), of a beautiful red colour next the sun, but of a bright yellow towards the wall ; it has an excellent rich juice ; the pulp adheres closely to the stone, where it is of a deep red colour : this ripens the latter end of *August*, and is the best flavoured of all the sorts.

4. *Scarlet Nectarine* is somewhat less than the last, of a fine red or scarlet colour next the sun, but loses itself in paler red towards the wall : this ripens in the end of *August*.

5. *Brugnon or Italian Nectarine* has smooth leaves ; the flowers are small ; it is a fair large fruit, of a deep red colour next the sun, but of a soft yellow towards the wall ; the pulp is firm, of a rich flavour, and closely adheres to the stone, where it is very red : this ripens in the end of *August*.

6. *Roman Red Nectarine* has smooth leaves and large flowers ; it is a large fair fruit, of a deep red or purple colour towards the sun, but has a yellowish cast next the wall ; the flesh is firm, of an excellent flavour, closely adhering to the stone, where it is very red : this ripens in the end of *August*.

7. *Murry Nectarine* is a middle-sized fruit, of a dirty red colour on the side next the sun, but of a yellowish green towards the wall ; the pulp is tolerably well flavoured : this ripens the beginning of *September*.

8. *Golden Nectarine* is a fair handsome fruit, of a soft red colour next the sun, but of a bright yellow next the wall ; the pulp is very yellow, of a rich flavour, and closely adheres to the stone, where it is of a faint red colour : this ripens the middle of *September*.

9. *Temple's Nectarine* is a middle-sized fruit, of a soft red colour next the sun, but of a yellowish green toward the wall ; the pulp is melting, of a white colour towards the stone, from which it parts, and has a fine poignant flavour : this ripens the end of *September*.

9. *Peterborough, or late green Nectarine*, is a middle-sized fruit, of a pale green colour on the outside next the sun, but of a whitish green towards the wall ; the flesh is firm, and, in a good season, well flavoured : this ripens the middle of *October*.

There are some persons who pretend to have more sorts than I have here set down, but I much doubt whether they are different from those here mentioned, there being so near a resemblance between the fruits of this kind, that it requires a very close attention to distinguish them well, especially if the trees grow in different soils and aspects, which many times alters the same fruit so much, as hardly to be distinguished by persons who are very conversant with them ; therefore, in order to be thoroughly acquainted with their differences, it is necessary to consider the shape and size of their leaves, the size of their flowers, their manner of shooting, &c. which is many times very helpful in knowing of these fruits.

The culture of this fruit differing in nothing from that of the Peach, I shall forbear mentioning any thing on that head in this place, to avoid repetition, but refer the reader to the article of *PERSICA*, where there is an ample account of their planting, pruning, &c.

NEPETA. *Lin. Gen. Plant.* 629. Catmint, or Nep.

The Characters are,

The empalement of the flower is cylindrical, indented into five acute parts at the top, The flower is of the lip kind, with one petal, having an incurved cylindrical tube, gaping at the top. The upper lip is erect, roundish, and indented at the point. The under lip is large, concave, entire, and sawed on the edge. It hath four awl-shaped stamina, situated under the upper lip, two of which are shorter than the other. In the bottom of the tube is situated the quadrifid germen, which afterward turns to four oval seeds, sitting in the empalement.

The Species are,

1. *NEPETA floribus spicatis, verticillis subpedicellatis, foliis petiolatis cordatis dentato-serratis. Lin. Sp. Plant.* 570. Catmint with spiked flowers, whose whorls have very short foot-stalks, and heart-shaped leaves growing on foot-stalks, which are indented like the teeth of a saw ; or common Greater Catmint.

2. *NEPETA floribus spicatis, spicis interruptis, verticillis pedicellatis, foliis subcordatis serratis petiolatis.* Catmint with spikes of flowers, which have interrupted whorls standing on foot-stalks, and sawed leaves almost heart-shaped ; or Smaller common Catmint.

3. *NEPETA floribus spicatis, verticillis subsessilibus, foliis cordato-oblongis serratis sessilibus.* Catmint with spiked flowers, whose whorls grow almost close to the stalks, and oblong, sawed, heart-shaped leaves, sitting close ; or Greater narrow-leaved Catmint.

4. *NEPETA foliis linearibus, profundè dentatis, inferioribus petiolatis, supernè sessilibus, verticillis pedicellatis longioribus.* Catmint with linear leaves, which are deeply indented, the lower ones standing upon foot-stalks, the upper ones sitting close, and whorls of flowers standing upon very long foot-stalks ; or Smaller narrow-leaved Catmint.

5. *NEPETA floribus paniculatis, foliis oblongo-cordatis acutis serratis sessilibus.* Catmint with panicled flowers, and oblong, heart-shaped, acute, sawed leaves, sitting close to the stalks ; or Smaller Catmint with a Turkey Balm leaf.

6. *NEPETA floribus sessilibus verticillato-spicatis, bracteis lanceolatis longitudine calycis, foliis petiolatis. Lin. Sp. Plant.* 571. Catmint whose flowers grow in whorled spikes, sitting close to the stalk, with spear-shaped bractæ the length of the empalement, and leaves growing upon foot-stalks ; or Smaller Alpine Catmint.

7. *NEPETA verticillis pedunculatis corymbosis, foliis petiolatis cordato-oblongis dentatis. Lin. Sp. Plant.* 570. Catmint with roundish whorls standing upon foot-stalks, and oblong, heart-shaped, indented leaves.

8. *NEPETA floribus spicatis sessilibus, bracteis ovatis coloratis, verticilla excipientibus, foliis sessilibus. Hort. Cliff.* 311. Catmint with spiked flowers sitting close to the stalks, oval-coloured bractæ receiving the whorls, and leaves sitting close to the stalks.

9. *NEPETA floribus sessilibus verticillato-spicatis, verticillis tomento obvolutis. Hort. Cliff.* 311. Catmint with flowers growing in whorled spikes, sitting close to the stalk, and the whorls covered with down.

10. *NEPETA foliis lanceolatis, capitulis terminalibus, staminibus flore longioribus. Lin. Sp. Plant.* 571. Catmint with spear-shaped leaves, stalks terminated by flowers growing in heads, and stamina longer than the flower.

11. *NEPETA floribus spicatis, verticillis crassioribus, foliis cordatis obtusè dentatis petiolatis.* Catmint with spiked flowers, whose whorls are very thick, and heart-shaped leaves, which are obtusely indented, and stand upon foot-stalks.

12. *NEPETA floribus verticillatis, bracteis ovatis hirsutis, foliis cordato-ovatis crenatis, caule procumbente.* Catmint with whorled flowers, having oval hairy bractæ, oval heart-shaped leaves, which are crenated, and a trailing stalk.

The

The first sort is the common Nep or Catmint, which grows naturally on the side of banks and hedges, in many parts of *England*. This has a perennial root, from which arise many square branching stalks, about two feet high, garnished at each joint by two heart-shaped leaves, standing opposite, upon pretty long foot-stalks; they are sawed on their edges, and hoary on their under side. The flowers grow in spikes at the top of the stalks, and below the spikes are two or three whorls of flowers, which have very short foot-stalks. The flowers are white, and have two lips; the upper lip stands erect, the lower is a little reflexed, and indented at the point; these are each succeeded by four oval black seeds, which ripen in the empalement.

The whole plant has a strong scent between Mint and Pennyroyal. It is called Catmint, because cats are very fond of it, especially when it is withered, for then they will roll themselves on it, and tear it to pieces, chewing it in their mouths with great pleasure. Mr. Ray mentions his having transplanted some of the plants of this sort, from the fields into his garden, which were soon destroyed by the cats, but the plants which came up from seeds in his garden escaped; which verifies the old proverb, *viz. If you set it the cats will eat it, if you sow it the cats will not know it*. I have frequently made trial of this, and have always found it true; for I have transplanted one of the plants from another part of the garden, within two feet of some plants which came up from seeds, the latter has remained unhurt, when the former has been torn to pieces and destroyed by the cats; but I have always observed, where there is a large quantity of the herb growing together, they will not meddle with it. This flowers in *June* and *July*, and the seeds ripen in autumn. It is used in medicine.

The second sort grows naturally in *Italy*, and the south of *France*. The stalks of this are slenderer, their joints farther asunder, the leaves are narrower, and the whole plant whiter than the first.

The stalks of the third sort do not branch so much as either of the former; they are slenderer, and their joints farther asunder; the leaves are small, narrow, and almost heart-shaped, sawed on their edges, hoary, and stand upon short foot-stalks. The spikes of flowers are more broken, or interrupted, than those of the second, and the whorls stand upon foot-stalks. It grows naturally in *Italy*.

The fourth sort hath slender stalks, which branch out near the ground. The joints are far asunder; the leaves are very narrow, and deeply sawed on their edges. The whorls of flowers come out from the wings of the stalk; those on the lower part have long foot-stalks, but these shorten upward, and the stalks are terminated by close whorls.

The fifth sort grows naturally in *Sicily*. This rises with a strong four-cornered stalk near three feet high; the lower joints are four or five inches asunder. The leaves are long, narrow, and heart-shaped, deeply sawed on their edges, and set pretty close to the stalk. The flowers grow in panicles along the stalks, and are of a pale purplish colour. It flowers about the same time with the other sorts.

The sixth sort grows naturally upon the *Alps*; the stalks of this seldom rise more than a foot and a half high, sending out very few branches. The whorls of flowers, which form the spike, are distant from each other, and set close to the stalk. The leaves are short, oval, heart-shaped, and stand upon foot-stalks; the plant is hoary, and strong scented.

The seventh sort grows naturally in *Spain*; the stalks of this rise about two feet high, and have a few slender branches coming out from their sides. The leaves are heart-shaped, and indented on their edges. The flowers grow in roundish whorls upon foot-stalks, and are blue; there is also a variety of this with white flowers.

The eighth sort grows naturally in *Portugal*. This has a thick knobbed root, from which comes out one or two stalks, which often decline to the ground. The leaves are oblong, crenated on their edges, sit close to the stalks, and are of a deep green. The upper part of the stalk, for more than a foot in length, is garnished with whorls of flowers, the lower being two inches asunder, but are nearer all the way upward; these sit very close to the stalks, and are guarded by oval, small, coloured leaves or bractæ. The flowers are blue, and shaped like those of the other species; there is one of this sort with an erect stalk, which is the only difference between them.

The ninth sort grows naturally in *Sicily*. The stalks of this grow about two feet high; the branches come out toward the bottom; the leaves are heart-shaped, obtuse, and but little indented, standing upon pretty long foot-stalks. The stalks are terminated by long spikes of whorled flowers, which are separated, and sit close to them; these are wrapped in a hoary down. The flowers are white, and appear in *July*.

The tenth sort grows naturally in *North America*. This hath a perennial root, from which arise several four-cornered stalks two feet high, which are garnished with hairy leaves, somewhat like those of Marjoram, but are larger. The flowers grow in whorls round the stalks, and also at the extremity of the stalk, in a large roundish whorl or head; they are of a pale flesh colour, and their stamina is longer than the petal. It flowers in *July*.

The eleventh sort grows naturally in the *Levant*. The stalks of this are strong, and rise near three feet high. The leaves are heart-shaped, and have blunt indentures on their edges, standing upon short foot-stalks. The flowers grow in whorled spikes at the top of the stalks; the whorls are very thick, and set close together, terminating in an obtuse point. The flowers are of a pale flesh colour; the whole plant is hoary, and has a strong scent.

The twelfth sort grows naturally among the rocks in *Candia*, where it is used as Water Germander by the inhabitants; this hath four-cornered stalks a foot long, which trail upon the ground, sending out some slender branches from the side. The leaves are very like those of the round-leaved Mentastrum, sitting close to the stalk. The flowers grow in thick roundish whorls, which sit close to the stalk, and are surrounded by oval hairy leaves or bractæ. The flowers are white, and just peep out of their empalements. The roots of this sort seldom continue longer than two years, but as the seeds ripen well, so if they are permitted to scatter, the plants will come up the following spring.

All the sorts are very hardy, so are not injured by frost; they are easily propagated by seeds, for if they are permitted to fall, the plants will rise without trouble; or if the seeds are sown, either in the spring or autumn, the plants will come up, and require no other culture, but to thin them where they are too close, and keep them clean from weeds. If these plants are sown upon a poor dry soil, they will not grow too rank, but will continue much longer, and appear handsomer than in rich ground, where they grow too luxuriant, and have not so strong a scent.

NERIUM. *Lin. Gen. Plant.* 262. The Oleander, or Rose Bay.

The Characters are,

The empalement of the flower is permanent, and cut into five acute segments. The flower has one funnel-shaped petal cut into five broad obtuse segments, which are oblique. It hath a nectarium terminating the tube, which is torn into hairy segments. It hath five short awl-shaped stamina within the tube. It hath an oblong germen, which is bisid, with scarce any style, crowned by single stigmas. The germen afterward turns to two long, taper, acute-pointed pods, filled with oblong seeds, lying over each other like the scales of fish, and crowned with down.

The Species are,

1. *NERIUM foliis linearilanceolatis rigidis sæpius ternis erectis*. Oleander, or Rose Bay, with linear, spear-shaped, rigid leaves, which are erect, and often placed by threes round the stalk; or Oleander with red flowers.

2. *NERIUM foliis linearibus rigidis*. Oleander, or Rose Bay, with linear rigid leaves; or Indian Rose Bay, with single sweet-scented flowers.

3. *NERIUM foliis lanceolatis longioribus, flaccidis*. Rose Bay with longer, spear-shaped, flaccid leaves; commonly called the Double Oleander.

The first sort grows naturally in Greece, and in several parts near the Mediterranean sea, generally by the sides of rivers and brooks: there are two varieties of this, one with white, the other with red flowers, but seem to have no other difference, so may properly be placed together as one species, though that with white flowers is rarely found growing wild in any place, but the island of Crete.

This rises with several stalks, to the height of eight or ten feet. The branches come out by threes, round the principal stalks, and have a smooth bark, which in the red flowering is of a purplish colour, but the white sort hath a light green bark. The leaves for the most part stand by threes round the stalks, upon very short foot-stalks, and point upward, of a dark green, very stiff, and end in acute points. The flowers come out at the end of the branches in large loose bunches, which are in one of a bright purple, or crimson colour, and in the other they are of a dirty white; they have short tubes, which spread open at the top, where they are deeply cut into five obtuse segments, which are twisted at bottom, so are oblique to the tube. At the mouth of the tube the torn capillary nectarium is situated, and within the tube are the five stamina, with the germen at bottom, which afterward turns to a brown, taper, double pod, about four inches long, which opens longitudinally on one side, and is filled with oblong seeds, crowned with long hairy down, lying over each other like the scales of fish. This plant flowers in July and August, and in warm seasons they are succeeded by pods, but the seeds seldom ripen well here.

When the summers are warm and dry, these plants make a fine appearance, for then they open and flower in great plenty; but, in cold moist seasons, the flowers often decay without expanding, and the sort with white flowers, is more tender than the red; so that unless the weather is warm and dry at the time the flowers appear, they rot, and make no figure, unless they are placed under glasses to screen them.

The second sort grows naturally in India; this rises with shrubby stalks six or seven feet high, which are covered with a brown bark, garnished with stiff leaves, from three to four inches long, and not more than a quarter of an inch broad; they are of a light green, and their edges are reflexed; these are placed sometimes by pairs opposite, at others they are alternate, and sometimes by threes round the branches. The flowers are produced in loose bunches at the end of the branches; they are of a pale red, and have an agreeable musky scent. It flowers at the same time with the former, but the flowers seldom open here in the open air, so that unless the plants are placed in an airy glass-case, where they are defended from wet and cold, they will not flower.

The third sort grows naturally in both Indies; this plant was first introduced to the British islands in America, from the Spanish Main, and is called by the inhabitants of those islands South Sea Rose; the beauty and sweetness of its flowers engaged the inhabitants of the islands to cultivate the plants, so that in many places they were planted to form hedges; but the cattle browsing upon them, when there was scarcity of food, were many of them killed, which has occasioned their being destroyed in all places exposed to

cattle, so that now they are only preserved in gardens, where they make a fine appearance great part of the year; for in those warm countries, they are seldom destitute of flowers: this has been by some persons, who have only a superficial knowledge of plants, thought only a variety of the common sort, but those who have cultivated both, know better; for the first will live through the winter in England, if planted in a warm situation, but this is too tender to thrive in England, unless preserved in a warm greenhouse; nor will the plants flower without the assistance of a glass-case in summer. The third sort was not known here till the middle of the last century, being a stranger in Europe, but the former has been in the English gardens near two centuries: nor has the seeds of the first ever produced plants of the third sort, notwithstanding it has been positively asserted by persons of no skill.

The leaves of this sort are six inches long, and one inch broad in the middle, of a much thinner texture than those of the first, and their ends are generally reflexed; they are of a light green, and irregularly placed on the branches; sometimes they are by pairs, at others alternate, and sometimes by threes round the branches. The flowers are produced in very large bunches at the end of the branches, standing upon very long foot-stalks; they have three or four series of petals within each other, so are more or less double. The flowers are much larger than those of the common sort, and smell like the flowers of Hawthorn. The plain flowers are of a soft red, or Peach colour; but in most they are beautifully variegated with a deeper red, and make a fine appearance. Their usual time of flowering is in July and August, but if they are placed in a warm stove, they will continue to Michaelmas. As the flowers of this are double, they are not succeeded by seeds, and at present we are unacquainted with the single flowering of this kind, for the second is undoubtedly a distinct species.

All the species of the Rose Bay, are supposed to have a poisonous quality; the young branches, when cut or broken, have a milky sap or juice, and the larger branches, when burnt, emit a very disagreeable odour, so there is great reason to believe the plants have some noxious quality; but this genus of plants has been confounded by many of the writers on botany, with the Chamærhododendros of Tournefort, and many of the noxious qualities with which the latter abounds, have been applied to the Nerium, but particularly that of the honey, about Trebisond, which is reckoned very unwholesome; which has been supposed to be occasioned by the bees sucking it from the flowers of the Nerium, whereas it is from the flowers of the Chamærhododendros, as Tournefort has fully informed us; but the affinity of their names in the Greek language, has occasioned these two plants to be often confounded.

These plants are generally propagated by layers in this country, for although they will take root from cuttings, yet that being an uncertain method, the other is generally pursued; and as the plants are very apt to produce suckers, or shoots from their roots, those are best adapted for laying, for the old branches will not put out roots; when these are laid down, they should be slit at a joint, in the same manner as is practised in laying of Carnations, which will greatly facilitate their taking root; if these branches are laid down in autumn, and are properly supplied with water, they will have taken root by that time twelvemonth, when they should be carefully raised up with a trowel, and if they have taken good root, they should be cut off from the old plant, and each planted in a separate small pot, filled with soft loamy earth; those of the common sort will require no other care, but to be placed in a shady situation, and gently watered as the season may require, till they have taken new root; but the two other species should be plunged into a very moderate

rate hot-bed, to forward their taking root, observing to shade them from the sun in the heat of the day; after the common sort has taken new root, the plants may be placed in a sheltered situation with other hardy exoticks, where they may remain till the end of *October*, when they should either be removed into the green-house, or placed under a hot-bed frame, where they may be protected from frost in winter, but enjoy the free air at all times, when the weather is mild.

This sort is so hardy as to live abroad in mild winters, if planted in a warm situation; but as they are liable to be destroyed in severe frost, the best way is to keep the plants in pots, or if they are very large, in tubs, that they may be sheltered in winter, and in the summer removed abroad, placing them in a warm sheltered situation. In the winter they may be placed with Myrtles, and other of the hardier kinds of exotick plants, in a place where they may have as much free air as possible, in mild weather, but screened from severe frost; for if these are kept too warm in winter, they will not flower strong, and when the air is excluded from them, the ends of their shoots will become mouldy, so that the hardier they are treated, provided they are not exposed to hard frosts, the better they will thrive.

The other two sorts require a different treatment, otherwise they will not make any appearance; therefore the young plants when they have taken new root, should be gradually inured to bear the open air, into which they should be removed in *July*, where they may remain till *October*, provided the weather continues mild; but during this time, they should be placed in a sheltered situation; and upon the first approach of frost, they should be removed into shelter, for if their leaves are injured by frost, they will change to a pale yellow, and will not recover their usual colour till the following summer. These sorts may be preserved in a good green-house through the winter, and the plants will be stronger than those which are more tenderly treated; but in *May*, when the flower-buds begin to appear, the plants should be placed in a open glass-case, where they may be defended from the inclemency of the weather; but when it is warm weather, the air should at all times be admitted to them in plenty. With this management the flowers will expand, and continue long in beauty; and during that time, there are few plants which are equal to them, either to the eye or nose, for their scent is very like that of the flowers of the White Thorn; and the bunches of flowers will be very large, if the plants are strong.

NICOTIANA. *Tourn. Inst. R. H.* 117. *tab.* 41. Tobacco.

The Characters are,

The empalement of the flower is permanent, of one leaf, cut into five acute segments. The flower has one funnel-shaped petal, with a long tube spread open at the brim, ending in five acute points. It hath five awl-shaped stamina which are the length of the tube, a little inclined and terminated by oblong summits, and an oval germen supporting a slender style, crowned by an indented stigma. The germen afterward turns to an oval capsule, having two cells which open at the top, and are filled with rough seeds fastened to the partition.

The Species are,

1. NICOTIANA *foliis ovato-lanceolatis rugosis, semi-amplexicaulibus.* Tobacco with oval, spear-shaped, rough leaves, which half embrace the stalks.

2. NICOTIANA *foliis lanceolatis sessilibus.* Tobacco with spear-shaped leaves sitting close to the stalks; or broad-leaved Tobacco.

3. NICOTIANA *foliis lanceolatis acutis, sessilibus, calycibus acutis, tubo floris longissimo.* *Plat.* 185. Tobacco with acute spear-shaped leaves sitting close to the stalks, sharp-pointed empalements, and a very long tube to the flower; or narrow-leaved Tobacco.

4. NICOTIANA *foliis lineari-lanceolatis acuminatis, semi-*

amplexicaulibus, caule fruticoso. Tobacco with linear, spear-shaped, acute-pointed leaves, half embracing the stalks, and a shrubby stalk.

5. NICOTIANA *foliis ovatis acuminatis semiamplexicaulibus, capsulis ovatis obtusis.* Tobacco with oval acute-pointed leaves, half embracing the stalk, and oval obtuse seed-vessels.

6. NICOTIANA *foliis ovato-lanceolatis sessilibus, caule fruticoso perenni.* Tobacco with oval spear-shaped leaves sitting close to the stalks, and a shrubby perennial stalk.

7. NICOTIANA *foliis ovatis Hort. Cliff.* 56. Tobacco with oval leaves; commonly called *English Tobacco*.

8. NICOTIANA *foliis ovatis rugosis petiolulatis.* Tobacco with oval rough leaves having foot-stalks.

9. NICOTIANA *foliis cordatis, floribus paniculatis, tubis clavatis.* *Lin. Sp. Plant.* 180. Tobacco with heart-shaped leaves, paniculated flowers, and club-shaped tubes.

10. NICOTIANA *foliis cordatis, corollis racemosis subringentibus, calycibus inæqualibus.* *Lin. Sp. Plant.* 181. Tobacco with heart-shaped leaves, branching ringent petals, and unequal empalements.

11. NICOTIANA *foliis ovato-lanceolatis obtusis rugosis calycibus brevissimis.* *Plat.* 185. Tobacco with oval, spear-shaped, obtuse, rough leaves, and a very short empalement.

The first sort is the most common Tobacco which is sown in *England*, and which has been generally taken for the broad-leaved Tobacco of *Caspar Bauhin*, and others, but is greatly different from it. The leaves of this sort are more than a foot and a half long, and a foot broad, the surface very rough and glutinous: when these plants are in a rich moist soil, they will grow more than ten feet high; the base of the leaves half embrace the stalks; the upper part of the stalk divides into smaller branches, which are terminated by loose bunches of flowers standing erect; they have pretty long tubes, and are of a pale purplish colour. It flowers in *July* and *August*, and the seeds ripen in the autumn. This is the sort of Tobacco which is commonly brought to the markets in pots, to adorn the shops and balconies of *London*, and by some is called *Oroonoko Tobacco*.

The second sort is the broad-leaved Tobacco of *Caspar Bauhin*; the stalks of this seldom rise more than five or six feet high, and divide into more branches than the first. The leaves are about ten inches long and three and a half broad, smooth, and end in acute points, sitting close to the stalks; the flowers of this are rather larger, and of a brighter purple colour than those of the first. It flowers and perfects seeds at the same time; this is by some called sweet-scented Tobacco.

The third sort rises with an upright branching stalk, four or five feet high; the lower leaves are a foot long, and three or four inches broad; those on the stalks are much narrower, lessening to the top, and end in very acute points, sitting close to the stalks; they are very glutinous. The flowers grow in loose bunches at the top of the stalks, they have long tubes, and are of a bright purple or red colour. These appear at the same time with the former sorts, and their seeds ripen in the autumn.

The fourth sort rises with very branching stalks about five feet high; the leaves on the lower part of the stalks are a foot and a half long, broad at the base where they half embrace the stalks, and are about three inches broad in the middle, terminating in long acute points; the stalks divide into many smaller branches, which are terminated by loose bunches of flowers of a bright purple colour, and are succeeded by acute-pointed seed-vessels. This flowers about the same time with the former, but if the plants are placed in a warm green-house, they will live through the winter. The seeds of this sort were sent me for *Brazi* Tobacco.

The fifth sort grows naturally in the woods in the island of *Tobago*, from whence the seeds were sent me by the late Mr. *Robert Millar*. This rises about five feet high; the stalk does not branch so much as those of the former; the leaves are large and oval, about fifteen inches long and two broad in the middle, but diminish gradually in their size to the top of the stalk, and with their base half embrace it. The flowers grow in closer bunches than those of the former, and are white; these are succeeded by short, oval, obtuse seed-vessels. It flowers and perfects seeds about the same time with the former.

The sixth sort grows naturally at *Senegal* in *Africa*, from whence the seeds were sent by Mr. *Adanson*, to the royal garden at *Paris*. This rises about four or five feet high; the lower leaves are nine inches long, and four broad in the middle; they are smooth, and sit close to the stalks; the upper leaves are of the same form, but gradually diminish toward the top in their size. The flowers are collected in pretty close bunches, they are of a pale purple colour, and are succeeded by oblong seed-vessels, inclosed in acute five-pointed empalements. The stalks of this sort are perennial, and put out shoots from their joints; if the plants are sheltered in winter, they will live two or three years.

The seventh sort is commonly called *English Tobacco*, from its having been the first which was introduced here, and being much more hardy than the other sorts. The seeds ripen very freely, and scattering in the autumn, the plants have come up without care, wherever any of the plants have been suffered to seed, so that it has been a weed in many places; but it came originally from *America*, by the title of *Petum*. *Dodonæus*, *Tabernemontanus*, and others, have titled it *Hyoscyamus luteus*, from the affinity there is between this plant and the Henbane; but the flowers of this are tubulous, and not ringent, as are those of the Henbane; nor do the seed-vessels of this open with a lid on the top, as that of Henbane. The stalks of this seldom rise more than three feet high; the leaves are placed alternately on the stalks, standing upon short foot-stalks; they are oval and smooth. The flowers grow in small loose bunches on the top of the stalks; they have short tubes, which spread open at the top, and are cut into five obtuse segments. They are of an herbaceous yellow colour, appearing in *July*, and are succeeded by roundish capsules filled with small seeds, which ripen in the autumn.

The eighth sort rises with a strong stalk near four feet high; the leaves of this are shaped like those of the former, but are greatly furrowed on their surface, and near twice the size of the former, of a darker green, and have longer foot-stalks. The flowers are larger than those of the former, and of the same shape. This is undoubtedly a distinct plant from the former, for I have sown the seeds more than thirty years, and have never found any of the plants vary.

The ninth sort was found growing naturally in the valley of *Lima*, by *Pere Feuille*, in the year 1710; and of late years the seeds of it were sent from *Peru*, by the younger *de Jussieu*, to *Paris*. The stalk of this sort rises more than three feet high, dividing upward into many smaller branches, which are rounder and a little hairy; the leaves are heart shaped, about four inches long, and three broad, standing upon pretty long foot-stalks. The flowers are produced in loose panicles at the end of the branches; these have tubes about an inch long, shaped like a club; the brim is slightly cut into nine obtuse segments, which are reflexed; they are of a yellowish green colour, and are succeeded by roundish capsules, filled with very small seeds. It flowers about the same time with the other sorts.

The seeds of the tenth sort were sent from *Peru* with those of the former, by the younger *de Jussieu*; the stalk of this is round, and rises near four feet high, sending out

two or three branches from the lower part; the leaves are large, heart-shaped, and a little waved; they are very clammy, standing upon long foot-stalks. The flowers grow in long loose spikes at the top of the stalk, having short open tubes, which are curved almost like the lip flowers; they are of a dull purple colour; the empalement is unequally cut, one of the segments being twice the size of the other.

The eleventh sort was discovered by the late Dr. *Houfoun* at *La Vera Cruz*, who sent the seeds to *England*. This hath a pretty thick taper root, which strikes deep in the ground; at the top comes out six or seven oval spear-shaped leaves, which spread on the ground; they are about the size of those of the common Primrose, but of a deeper green; the stalk rises about a foot high, branching into three or four divisions, at each of these is placed one small leaf; the branches are terminated by a loose spike of flowers, which are small, tubulous, of a yellowish green colour, having very short empalements, which are cut at the brim into five acute segments. The seed-vessel is small, oval, and divided into two cells, which are full of small seeds.

All the sorts except the seventh and eighth, require the same culture, and are too tender to grow from seeds sown in the full ground, to any degree of perfection in this country, so require to be raised in a hot-bed, after the following manner:

The seeds must be sown upon a moderate hot-bed in *March*, and when the plants are come up fit to remove, they should be transplanted into a new hot-bed of a moderate warmth, about four inches asunder each way, observing to water and shade them until they have taken root; after which you must let them have air in proportion to the warmth of the season, otherwise they will draw up very weak, and be thereby less capable of enduring the open air: you must also observe to water them frequently, but while they are very young, it should not be given to them in too great quantities; though when they are pretty strong, they will require to have it often, and in plenty.

In this bed the plants should remain until the beginning of *May*, by which time (if they have succeeded well) they will touch each other, therefore they should be inured to bear the open air gradually; after which they must be taken up carefully, preserving a large ball of earth to each root, and planted into a rich light soil, in rows four feet asunder, and the plants three feet distance in the rows, observing to water them until they have taken root; after which they will require no farther care (but only to keep them clear from weeds) until the plants begin to shew their flower-stems; at which time you should cut off the tops of them, that their leaves may be better nourished, whereby they will be rendered larger, and of a thicker substance. In *August* they will be full grown, when they should be cut for use; for if they are permitted to stand longer, their under leaves will begin to decay. This is to be understood for such plants as are propagated for use, but those plants which are designed for ornament, should be planted in the borders of the pleasure-garden, and permitted to grow their full height, where they will continue flowering from *July*, till the frost puts a stop to them.

The two smaller sorts of Tobacco are preserved in botanick gardens for variety, but are seldom propagated for use. The first sort is found growing upon dunghills, in divers parts of *England*. These are both very hardy, and may be propagated by sowing their seeds in *March*, upon a bed of light earth, where they will come up, and may be transplanted into any part of the garden, where they will thrive without farther care.

The last sort being somewhat tenderer than the other, should be sown early in the spring on a hot-bed; and when

e plants come up, they should be transplanted on another moderate hot-bed, where they must be duly watered, and should have a large share of free air in warm weather; and when the plants have obtained a good share of strength, they should be transplanted into separate pots, and plunged into a moderate hot-bed to bring them forward. About the middle of *June* some of the plants may be shaken out of the pots, and planted into beds of rich earth; but it will be proper to keep some plants in pots, which may be placed in the stove (in case the season should prove bad), that they may ripen their seeds, so that the species may be preserved.

NIGELLA. *Tourn. Inst. R. H. 258. tab. 134.* Fennel Flower, or Devil in a Bush.

The Characters are,

The flower has no empalement, but a leafy perianthium. It hath five oval, obtuse, plain petals, which spread open, and are contracted at their base, and eight very short nectariums situated in a circle, each having two lips, the exterior being larger, the inferior bifid, plain, and convex. It hath a great number of awl-shaped stamina, which are shorter than the petals, terminated by obtuse, compressed, erect summits; and in some five, in others ten, oblong, convex, erect germen. The germen afterward become so many oblong compressed capsules, divided by a furrow, but connected within, filled with rough angular seeds.

The Species are,

1. **NIGELLA** *pisillis quinis, petalis integris, capsulis turbinatis.* *Lin. Sp. Plant. 534.* Fennel Flower having five pointals, entire petals, and turbinated seed-vessels.

2. **NIGELLA** *floribus involucro folioso cinctis.* *Hort. Cliff. 215.* Fennel Flower whose flowers are encompassed with a leafy involucre.

3. **NIGELLA** *petalis subtricuspidatis, foliis subpilosis.* *Hort. Upsal. 154.* Fennel Flower with petals which are almost three-pointed, and leaves somewhat hairy.

4. **NIGELLA** *pisillis quinis corollâ longioribus, petalis integris.* Fennel Flower with five pointals longer than the petals, which are entire.

5. **NIGELLA** *pisillis denis corollâ brevioribus.* Fennel Flower with ten pointals, which are shorter than the petals.

6. **NIGELLA** *pisillis denis corollam æquantibus.* *Hort. Upsal. 154.* Fennel Flower with ten pointals of equal length with the petals.

7. **NIGELLA** *pisillis denis corollâ longioribus.* *Hort. Cliff. 215.* Fennel Flower with ten pointals which are longer than the petals.

The first sort grows naturally among the Corn, in *France, Italy, and Germany*, so is seldom propagated in gardens.

The second sort grows naturally in *Spain and Italy*, among the Corn; this rises with an upright branching stalk, a foot and a half high, garnished with leaves much longer, and finer than those of the first. The flowers are large, of a pale blue, and have a long leafy involucre under each; these are succeeded by larger swelling seed-vessels, with horns at the top; of this there is one with single white flowers, and another with double flowers, which is sown in gardens for ornament.

The third sort grows naturally in *Crete*; this rises about the same height as the former. The leaves are not so finely cut as those of the second, and are a little hairy. At the top of each stalk is one flower, composed of five white petals, which are slightly cut at their end into three points; these are succeeded by oblong swelling seed-vessels, with five horns at the top, filled with small pale-coloured seeds.

The fourth sort also grows naturally in *Crete*; this rises with branching stalks about a foot high, garnished with shorter and broader leaves than either of the other species. At the top of each branch is one flower, having no involucre; they are composed of five petals, and have five

pointals longer than the petals; the seed-vessel is not much swollen, and has five slender horns at the top; the seeds are of a light yellowish brown colour.

The fifth sort is also a native of *Crete*; this rises with a branching stalk a foot high, garnished with leaves like those of *Larkspur*. The flowers have five large oval petals which are entire, and ten pointals which are shorter than the petals, and a great number of green stamina with blue chives; the seed-vessels are like those of the last sort.

The sixth sort rises a foot and a half high; the lower leaves are finely cut, but those on the stalk are cut into broader segments. The flowers are larger than those of the other species, they are of a fine blue colour: the pointals of this are of equal length with the petals; the seed-vessel has five horns, and is of a firmer texture than any of the other. This grows naturally in the south of *France and Spain*; there is a variety of this with double flowers.

The seventh sort grows naturally in the Corn-fields about *Aleppo*; this rises with a branching stalk a foot and a half high, garnished with pretty long leaves, which are finely divided. The flowers are produced at the end of the branches, they are composed of five yellowish leaves or petals; at the base of these are placed eight nectariums, between which arise a great number of stamina, with an unequal number of germen, some having but five, others having eight or nine; they are oblong and compressed; these afterward become so many oblong compressed seed-vessels, joined together on their inner side, terminating with horns, and open longitudinally, containing many thin compressed seeds, having borders round them.

The varieties of these with double flowers, are chiefly propagated in gardens for ornament; but those with single flowers are rarely admitted into any but botanick gardens, where they are preserved for the sake of variety.

All these plants may be propagated by sowing their seeds upon a bed of light earth, where they are to remain (for they seldom succeed well if transplanted); therefore, in order to have them intermixed amongst other annual flowers in the borders of the flower-garden, the seeds should be sown in patches at proper distances; and when the plants come up, they must be thinned where they grow too close, leaving but three or four of them in each patch, observing also to keep them clear from weeds, which is all the culture they require. In *July* they will produce their flowers, and their seeds will ripen in *August*, when they should be gathered and dried; then rub out each sort separately, and preserve them in a dry place.

The season for sowing these seeds is in *March*; but if you sow some of them in *August*, soon after they are ripe, upon a dry soil and in a warm situation, they will abide through the winter, and flower strong the succeeding year; so by sowing of the seeds at different times, they may be continued in beauty most part of the summer.

They are all annual plants, which perish soon after they have perfected their seeds; which, if permitted to scatter upon the borders, will come up without any farther care.

NIGELLASTRUM. See *Agrostemma*.

NIGHTSHADE. See *Solanum*.

NIGHTSHADE, the Deadly. See *Belladonna*.

NIL. See *Anil*.

NISSOLIA. See *Lathyrus*.

NOLI ME TANGERE. See *Impatiens*.

NONSUCH, or FLOWER of BRISTOL. See *Lychnis*.

NORTHERN ASPECT is the least favourable of any in *England*, as having very little benefit from the sun, even in the height of summer, therefore can be of little use, whatever may have been advanced to the contrary; for although many sorts of fruit trees will thrive and produce fruit in such positions, yet such fruit can be of little worth, since

since they are deprived of the kindly warmth of the sun to correct their crude juices, and render them well tasted and wholesome; therefore it is to little purpose to plant fruit trees against such walls, except it be to those which are intended for baking, &c. where the fire will ripen, and render those juices wholesome, which, for want of sun, could not be performed while growing.

You may also plant Morello Cherries, for preserving; and white and red Currants, to come late, after those which are exposed to the sun are gone; and if the soil be warm and dry, some sorts of summer Pears will do tolerably well on such an exposure, and will continue longer in eating, than if they were more exposed to the sun. But you should by no means plant winter Pears in such an aspect, as hath been practised by many ignorant persons, since we find, that the best south walls, in some bad years, are barely warm enough to ripen those fruits.

Duke Cherries planted against walls exposed to the north, will ripen much later in the season, and if the soil is warm, they will be well flavoured, so that hereby this fruit may be continued a month later than is usual.

NURSERY, or nursery-garden, is a piece of land set apart for the raising and propagating of all sorts of trees and plants to supply the garden, and other plantations. Of this sort there are a great number in the different parts of this kingdom, but particularly in the neighbourhood of London, which are occupied by the gardeners, whose business it is to raise trees, plants, and flowers for sale; and in many of these there is at present a much greater variety of trees and plants cultivated, than can be found in any other part of Europe. In France, their nurseries (which are but few, when compared with those in England) are chiefly confined to the propagation of fruit trees, from whence they have the appellation of Pepinier. For there is scarce any of those gardens, where a person can be supplied either with ever-greens, flowering shrubs, or forest trees. And in Holland, their nurseries are principally for flowers; some few of them, indeed, propagate tender exotic plants. But those nurseries in the neighbourhood of London do, several of them, include all these, and from hence most of the curious persons abroad, are supplied with furniture for their gardens; therefore every planter should begin by making of a nursery upon the ground which is intended for planting, where a sufficient number of the trees may be left standing, after the others have been drawn out, to plant in other places; which, for all large growing trees, but particularly such as are cultivated for timber, will be found by much the most advantageous method; for all those trees which come up from the seed, or which are transplanted very young into the places where they are designed to remain, will make a much greater progress, and become larger trees, than any of those which are transplanted at a greater age, and hereby the expence and trouble of staking, watering, &c. will be saved, and the trees will succeed much better. These should be thinned gradually, as the trees advance; for, by taking away too many at first, the cold will check the growth of the remaining trees. But then those trees which are taken out from these nurseries, after a certain age, should not be depended on for planting; and it will be prudence rather to consign them for fuel, than by attempting to remove them large, whereby, in endeavouring to get them up with good roots, the roots of the standing trees will be often much injured.

What has been here proposed, must be understood for all large plantations in parks, woods, &c. but those nurseries which are only intended for the raising of ever-greens, flowering shrubs, or plants which are designed to embellish gardens, may be confined to one spot, because a small compass of ground will be sufficient for this purpose. Two or

three acres of land employed this way, will be sufficient for the most extensive designs, and one acre will be full enough for those of moderate extent.

Such a nursery as this should be conveniently situated for water; for where that is wanting, there must be an expence attending the carriage of water in dry weather. It should also be as near the house as it can with conveniency be admitted, in order to render it easy to visit at all times of the year, because it is absolutely necessary, that it should be under the inspection of the master, for unless he delights in it, there will be little hopes of success.

The many advantages which attend the having such a nursery, are so obvious to every person who has turned his thoughts the least to the subject, that it is needless for me to mention them here; and therefore I shall only beg leave to repeat here what I have so frequently recommended, which is the carefully keeping the ground always clean from weeds; for if these are permitted to grow, they will rob the young trees of their nourishment. Another principal business is, to dig the ground between the young plants at least once every year, to loosen it for the roots to strike out; but if the ground is stiff, it will be better to be repeated twice a year, viz. in October and March, which will greatly promote the growth of the plants, and prepare their roots for transplanting.

NUX AVELLANA. See Corylus.

NUX JUGLANS. See Juglans.

NUX VESICARIA. See Staphylo-dendron.

NYCTANTHES. Lin. Gen. Plant. 16. Arabian Jasmine.

The Characters are,

The empalement of the flower is cylindrical, of one leaf, cut into eight acute segments. The flower is of the sakver shape, of one leaf, with a cylindrical tube longer than the empalement, cut into eight segments at the top. It hath two small awl-shaped stamina, situated in the bottom of the tube, and one roundish depressed germen, supporting a single style the length of the tube, crowned by a bifid erect stigma. The germen afterward becomes a roundish berry with two cells, each containing a large roundish seed.

The Species are,

1. NYCTANTHES caule volubili, foliis subovatis acutis. Hort. Upsal 4. Nyctanthes with a winding stalk, and oval acute leaves; or the Arabian Jasmine.

2. NYCTANTHES petiolis pedunculisque villosis. Lin. Sp. Plant. 6. Nyctanthes with the foot-stalks of the leaves and flowers hairy.

The first sort grows naturally in India, from whence it has been formerly brought to the islands in America, where the plants are cultivated for ornament; this rises with a winding stalk, to the height of ten or twelve feet, sending out many small branches, garnished with oval smooth leaves, of a light green, standing opposite, on short foot-stalks, which are hairy, ending in acute points. The flowers are produced at the end of the branches, upon short foot-stalks, each generally sustain three flowers, the two lower being opposite, and the middle one is longer; these have cylindrical empalements, which are short, and cut almost to the bottom into eight narrow segments. The tube of the flower is narrow, and is cut at the top into eight obtuse segments, which expand horizontally; they are of a pure white, and have a most agreeable odour, somewhat like the Orange flower, but sweeter; these flowers, when fully blown, drop out of their cups upon being shaken, and frequently fall in the night, so that when the plants are in full flower, the place under them is often covered with flowers in the morning, which soon change to a purplish colour. The plants continue flowering great part of the year, when they are kept in a proper temperature of warmth.

The second grows naturally in *India*, where it rises to the height of a tree, dividing into many branches, garnished with large, oval, smooth leaves, of a lucid green, with hairy foot-stalks; these come out on every side the branches, without order. The flowers are produced on the side of the branches, from the wings of the leaves, upon long hairy foot-stalks, each sustaining seven or eight flowers, which are of a pure white, and very fragrant, but have longer tubes than those of the former sort. The flowers of this plant open in the evening, and drop off in the morning, which has occasioned some to give it the title of *Arbor Tristis*, or the Sorrowful Tree, from its casting the flowers in the morning; this is very rare in *Europe* at present.

The plants of the first sort are frequently brought from *Italy*, by the *Italian* gardeners, who bring Orange trees here for sale; but those plants are always grafted upon stocks of the common *Jasmine*, which do not keep pace in their growth with the graft, so become very unfighly, when the plants are grown to any size; besides, the stocks are very subject to shoot from the bottom, and if these shoots are not constantly rubbed off, they will draw the nourishment from the graft, and starve it; therefore the best method to obtain the plants, is to propagate them by layers, or cuttings; the former is the surest method, for unless the cuttings are very carefully managed, they will not take root; and as the stalks of this sort are pliable, they may be easily brought down, and laid in pots filled with soft loamy soil, which should be plunged into a hot-bed of tan; if the branches are laid down in the spring and carefully watered, they will put out roots by autumn, when they may be cut from the old plants, and each transplanted into a separate small pot, and then plunged into the tan-bed, where they should be shaded from the sun till they have taken new root.

If these plants are propagated by cuttings, they should be planted in *April*, into pots filled with the before-mentioned earth, and plunged into a moderate hot-bed of tanners bark. The pots should be pretty large, and there may be ten or twelve cuttings planted in each; if these pots are closely covered with bell or hand-glasses, to exclude the air, it will greatly promote their taking root; they must also be shaded from the sun in the heat of the day, and gently refreshed with water when the earth is dry; with this management the cuttings will have taken root by *August*, when they may be transplanted into separate pots, and treated in the same way as the layers.

These plants may be preserved in a moderate degree of warmth, but if they are plunged in the tan-bed of the bark-stove, they will thrive much better, and produce a greater quantity of flowers; and as the leaves continue all the year, the plants will make a fine appearance in the stove at all seasons, and produce flowers great part of the year.

The second sort requires the same treatment but is much more difficult to propagate, so is very rarely found in the *European* gardens; there was two or three of these plants brought from *Florence* a few years since, but they were put into the hands of unskilful persons, so were lost.

NYMPHÆA. *Tourn. Inst. R. H.* 260. tab. 137, 138. The Water Lily.

The Characters are,

The empalement of the flower is composed of four or five coloured leaves. The flower hath many petals, sitting on the side of the germen, for the most part in a single series. It hath a great number of short, plain, incurved stamina, with oblong summits. It hath a large oval germen, but no style, with an orbicular, plain, target-shaped stigma. The germen afterward becomes a hard, oval, fleshy fruit, with a narrow neck, crowned at the top, and divided into ten or fifteen cells full of pulp, with many roundish seeds.

The Species are,

1. NYMPHÆA calyce magno pentaphyllo. *Flor. Lap.* 218. Water Lily with a large five-leaved empalement; or greater yellow Water Lily.

2. NYMPHÆA foliis cordatis integerrimis, calyce quadrifido. *Lin. Sp. Plant.* 510. Water Lily with heart-shaped entire leaves, and a four-pointed empalement; or greater white Water Lily.

There are some other species of this genus, which are natives of warm countries, but as they cannot, without great difficulty, be cultivated here, so I shall not enumerate them; for unless there is a contrivance for standing water in the stove, in which the plants may be planted, they will not grow; and such a place would be injurious to most other plants in the stove, by occasioning damps, so that unless a stove was contrived on purpose for some of these aquatick plants, it would be imprudent to attempt their cultivation.

The two sorts here mentioned, grow naturally in standing waters in many parts of *England*; they have large roots, which are fastened in the ground, from which arise the stalks to the surface of the water, where the leaves expand and float; they are large and roundish, those of the second sort are heart shaped. The flowers arise between the leaves, and swim upon the surface of the water. The white sort has a faint sweet scent; these appear in *July*, and are succeeded by large roundish seed-vessels, filled with shining black seeds, which ripen toward the end of *August*, when they sink to the bottom of the water.

The best method to propagate these plants is, to procure some of their seed-vessels just as they are ripe, and ready to open; these should be thrown into canals, or large ditches of standing water, where the seeds will sink to the bottom, and the following spring the plants will appear floating upon the surface of the water, and in *June* or *July* will produce their beautiful large flowers. When they are once fixed to the place, they will multiply exceedingly, so as to cover the whole surface of the water in a few years.

In some small gardens I have seen these plants cultivated in large troughs of water, where they have flourished very well, and have annually produced great quantities of flowers; but as the expence of these troughs is pretty great (their insides requiring to be lined with lead, to preserve them), there are few people who care to be at that charge.

NYSSA. *Flor. Virg.* 121. The Tupelo tree.

The Characters are,

It has hermaphrodite and male flowers on the same plant. It has no petal, but has ten awl shaped stamina, with twin summits as long as the stamina. The oval germen, situated under the flower, supports an awl-shaped incurved style crowned by an acute stigma. The germen afterward becomes an oval berry of one cell, inclosing an oval acute-pointed nut, with rough, angular, irregular furrows.

The Species are,

1. NYSSA foliis integerrimis. *Hort. Cliff.* 142. Tupelo tree with entire leaves.

2. NYSSA foliis acutè dentatis. Tupelo, with leaves acutely indented; commonly called Water Tupelo.

The first sort grows naturally in *Virginia* and several other parts of *North America*, where it rises with a pretty strong upright stalk, near twenty feet high, dividing at the top into several branches, garnished with pretty thick, soft, spear-shaped leaves, placed alternately. The flowers come out from the wings of the stalk, upon long foot stalks; they have a green empalement without petals. Some of them are male, which have ten stamina, and are barren; others are hermaphrodite, having five stamina, and a longer style arising from the germen, which is situated under the flower; these are succeeded by oval berries about

about the size of small Olives, inclosing a nut of the same form.

The second sort grows naturally in *Carolina*, in the shallow parts of rivers and swamps: it has a pretty large trunk, from which come out many branches toward the top, garnished with oblong, acute-pointed leaves, of a light green colour, standing upon long foot-stalks without order. The flowers come out from the wings of the stalk upon very long foot-stalks; they have no petals, but have a green empalement, and are some male, and others hermaphrodite, as in the first. The hermaphrodite flowers are succeeded by oblong oval berries, about the size and shape of *French Olives*, but are compressed, inclosing a rough hard-shelled nut of the same form.

Some of these plants have been introduced of late years into the *English* gardens, but there are few places where they have made much progress; they may be propagated by seeds, but these must be procured from places where they grow naturally, and should be put into the ground as soon as they arrive, for they always lie a year before the plants come up. The best way is to sow them in pots filled with light loamy earth, placing them where they may have only the morning sun; during the first summer the pots must be kept clean from weeds, and in dry weather duly watered. In autumn the pots should be plunged

into the ground, and if the winter should prove severe, they should be covered with old tan, Pease haulm, or other light covering, to prevent the frost from penetrating of the ground. The following spring the pots should be plunged into a moderate hot-bed which may be hooped over, and covered with mats, observing constantly to keep the earth moist. This will bring up the plants by the beginning of *May*; these must be gradually hardened to bear the open air, and during the following summer, the pots should be again plunged into an east border, and in dry weather duly watered. In autumn they should be removed into a frame where they may be screened from the frost, but in mild weather exposed to the open air. The spring following, before the plants begin to shoot, they should be parted carefully, and each planted in a separate small pot filled with loamy earth, and if they are plunged into a moderate hot-bed, it will forward their putting out new roots; then they may be plunged in an east border, and treated in the same way as in the former summer, and in winter sheltered again under a frame. The spring following such of the plants as have made the greatest progress, may be turned out of the pots, and planted in a loamy moist soil, in a sheltered situation, where they will endure the cold of this climate; but unless the ground is moist, they make very little progress.

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OAK. See *Quercus*.
OBELISCOOTHECA. See *Rudbeckia*.
OCHRUS. See *Pisum*.
OCULUS CHRISTI. See *Horminum sylvestre*.
OCYMUM. *Tourn. Inst. R. H. 203. tab. 96.* Basil.

The Characters are,

The empalement of the flower is short, permanent, of one leaf, divided into two lips. The flower is of the lip kind, of one petal inverted; the rising lip is broad, and cut into four obtuse equal parts; the reflexed lip is long, narrow, and sawed. It hath four stamina in the lower lip, which are reflexed, two of which are a little longer than the other, terminated by half-moon-shaped summits. The germen is divided into four parts, which afterward becomes four naked seeds inclosed in the empalement.

The Species are,

1. *O*CYMUM *foliis ovatis glabris, calycibus ciliatis.* Hort. Cliff. 315. Basil with oval smooth leaves, and hairy empalements.

2. *O*CYMUM *foliis ovatis integerrimis.* Hort. Upsal. 169. Basil with oval entire leaves; commonly called Bush Basil.

3. *O*CYMUM *hirsutum, foliis ovato-lanceolatis acuminatis dentatis.* Hairy Basil with oval spear-shaped leaves, which are indented, and end in acute points.

4. *O*CYMUM *foliis ovato-oblongis serratis, bracteis cordatis reflexis concavis.* Lin Sp. Plant. 597. Basil with oval, oblong, sawed leaves, and heart-shaped, concave, reflexed bractæ.

5. *O*CYMUM *foliis lanceolatis subtus incanis, petiolis longissi-*

mis villosis floribus pedunculatis. Basil with spear-shaped leaves, which are hoary on their under side, and very long hairy foot-stalks to the flowers.

6. *O*CYMUM *foliis lineari lanceolatis serratis.* Flor. Zeyl. 229. Basil with linear spear-shaped leaves, which are sawed.

7. *O*CYMUM *racemis secundis lateralibus, caule erecto.* Lin. Sp. Plant. 597. Basil with fruitful spikes of flowers on the side of the stalk, which are erect.

The three first sorts grow naturally in *India* and *Persia*. Of these there is a great variety, which differ in the size, shape, and colour of their leaves, as also in their odour; but as these differences are accidental, so I have not enumerated them, being convinced from repeated experiments, that the seeds of one plant will produce many varieties.

The first sort rises with a branching stalk a foot and a half high; the leaves are large, oval, and smooth; the stalk is hairy, and four-cornered; the leaves are placed by pairs opposite, and the branches also come out in the same manner; the stalk is terminated by a whorled spike of flowers, which is five or six inches long, and the branches are also terminated by short spikes of flowers of the same sort; the whole plant has a strong scent of Cloves.

Of this there are the following Varieties:

1. The fringed-leaved Basil with purple leaves.
2. The green fringed-leaved Basil.
3. The green Basil with studded leaves.
4. The large-leaved Basil.

The second sort is a low bushy plant, which seldom rises more than six feet high, spreading out into branches from the bottom, forming an orbicular head; the leaves are small, oval, and smooth, standing opposite on short foot-stalks. The flowers are produced in whorls toward the top of the branches; they are smaller than those of the former sort, and are seldom succeeded by ripe seeds in *England*.

Of this there are some *Varieties*, as

1. The smallest Basil with black purple leaves.
2. The smallest Basil with variable leaves.

The third sort is the common Basil which is used in medicine, and also in the kitchen, particularly by the *French* cooks, who make great use of it in their soups and sauces. This rises about ten inches high, sending out branches by pairs opposite, from the bottom; the stalks and branches are four-cornered; the leaves are oval, spear-shaped, ending in acute points, and are indented on their edges; the whole plant is hairy, and has a strong scent of Cloves, too powerful for most persons, but to some it is very agreeable: the whole plant is an ingredient in the compound Briony water.

There are some *Varieties* of this *Species*, viz.

1. Common Basil with very dark green leaves, and a Violet-coloured flower.
2. Curled-leaved Basil with short spikes of flowers.
3. Narrow-leaved Basil smelling like Fennel.
4. Middle Basil with a scent of Citron.
5. Basil with studded leaves.
6. Basil with leaves of three colours.

The fourth sort grows naturally in *India*. This rises with a branching stalk a foot and a half high, which is taper, and of a purplish colour; the leaves are short and hairy; they are of an oval oblong figure, ending in obtuse points; they are sawed on their edges, and stand upon pretty long foot-stalks. The stalks are terminated by three spikes of flowers, that in the middle being longer than the other two; the spikes are long and narrow, and the flowers have short foot-stalks; under each whorl of flowers are two small leaves (or bractæ) placed opposite, which are heart-shaped, concave, and reflexed. The flowers are small, and in some plants are of a purplish colour, but in general they are white; their empalements are smooth, and cut into five parts at the top; the style of the flower is longer than the petal, and the whole plant has a strong, sweet, aromatick odour.

The fifth sort rises with an upright stalk near two feet high, sending out sometimes two, and at others four branches toward the top, opposite, garnished with spear-shaped leaves; their foot-stalks are two inches long, and are hairy. The flowers grow in whorled spikes at the top of the stalks, standing upon foot-stalks, each sustaining three flowers; these are about the size of those of the common Basil, and are white; the whole plant has a strong aromatick odour.

The sixth sort grows naturally in the island of *Ceylon*. This rises with a branching stalk about a foot high, garnished with linear spear-shaped leaves, which are sawed. The flowers grow in whorled spikes at the top of the stalks, which are like those of the common Basil; the whole plant has an odour like Anise seeds.

The seventh sort grows naturally in the island of *Ceylon*. This rises with a square stalk two feet high, which is hairy, and divides into three branches at the top; the lower leaves are roundish, ending in points; they are hairy, and crenated on their edges, standing upon slender foot-stalks; the leaves on the stalks are narrower, shorter, and have foot-stalks an inch long; the stalks are terminated by three spikes of flowers in whorls, that in the middle being the longest. The flowers are reflexed and hang downward;

they are white, and larger than those of the common sort. This plant has less odour than the other sorts.

These plants, being most of them annual, are propagated from seeds, which should be sown in *March*, upon a moderate hot-bed; and when the plants are come up, they should be transplanted into another moderate hot-bed, observing to water and shade them until they have taken root; after which they should have plenty of air in mild weather, otherwise they will draw up very weak. In *May* they should be taken up with a ball of earth to their roots, and transplanted either into pots or borders, observing to shade them until they have taken root; after which they will require no farther care, but to clear them from weeds, and refresh them with water in dry weather. Though these plants are only propagated from seeds, yet if you have any particular sort which may arise from seeds, which you are desirous to increase, you may take off cuttings any time in *May* or *June*, and plant them on a moderate hot-bed, observing to water and shade them for about ten days; in which time they will take root, and in three weeks time be fit to remove, either into pots or borders, with the seedling plants. In *September* these plants will perfect their seeds, when those sorts which appear the most distinct should have their seeds preserved separate; for sowing the following spring.

The seeds of these plants are usually brought from the south of *France* or *Italy* every spring, because they seldom ripen their seeds in this country in the open air. But whoever is curious to preserve the seeds of any of the varieties, should place them in an airy glass-case or stove in the autumn, when the weather begins to be cold or wet; and by supplying them with water, and letting them have free air every day in mild weather, they will perfect their seeds very well in this country.

The sixth sort is more tender than any of the other. It was discovered growing wild at *Campeachy*, by the late *Dr. William Houfoun*. This should be sown on a hot-bed early in the spring, and when the plants are come up, they should be transplanted on another very temperate hot-bed, to bring them forward; and when they have obtained strength, they should be each transplanted into a separate pot, and placed either in the stove, or on a moderate hot-bed, where they may have a large share of air in warm weather; but by being sheltered from the cold and wet, the plants will perfect their seeds very well in *England*.

The seventh sort grows to be shrubby, and if placed in a moderate warmth in winter, may be preserved two years; but as this will ripen its seeds the first year, if the plants are brought forward in the spring, so it is rarely allowed a place in the stove; but if they should fail, the plants may be placed in the stove, where they may be kept through the winter, and the following season they will perfect their seeds. In the summer the plants should be placed in the open air in a sheltered situation, and in warm weather they should have plenty of water.

CENANTHE. *Tourn. Inst. R. H.* 312. tab. 166. Water Dropwort.

The Characters are,

It is a plant with an umbelliferous flower; the principal umbel has but few rays, but the particular umbels have many short ones; the rays of the principal umbel are difform. Those flowers in the disk are hermaphrodite, and are composed of five heart-shaped inflexed petals, which are almost equal. The germen is situated under the flower, supporting two awl-shaped permanent styles, crowned by obtuse segments. The germen afterward becomes an oval fruit, divided in two parts, containing two almost oval seeds, convex on one side and plain on the other.

The Species are,

1. CENANTHE foliis omnibus multifidis obtusis subæqualibus. *Hort. Cliff.* 99. Water Dropwort, whose leaves all end in many obtuse points, and are almost equal.

2. *CENANTHE stolonifera, foliis caulinis pinnatis filiformibus fistulosis.* *Lin. Sp. Plant.* 254. Water Dropwort with slender, fistular, winged leaves growing on the stalks.

3. *CENANTHE foliolis radicalibus ovatis incis, caulinis integris linearibus longissimis simplicioribus.* *Hort. Cliff.* 99. Water Dropwort, whose lower leaves are oval and cut, but those on the stalks entire, single, narrow, and very long.

4. *CENANTHE umbellularum pedunculis marginalibus longioribus ramosis masculis.* *Hort. Upsal.* 63. Water Dropwort, whose foot-stalks on the borders of the umbels are longer, branching, and bear male flowers.

5. *CENANTHE fructibus globosis.* *Hort. Cliff.* 99. Water Dropwort with globular fruit.

The first of those here mentioned, is very common by the sides of the *Thames* on each side *London*, as also by the sides of large ditches and rivers in divers parts of *England*: this plant commonly grows four or five feet high with strong jointed stalks, which, being broken, emit a yellowish fetid juice; the leaves are somewhat like those of the common Hemlock, but are of a lighter green colour: the roots divide into four or five large taper ones, which, when separated, have some resemblance to Parsneps; for which some ignorant persons have boiled them, whereby themselves and family have been poisoned.

This plant is one of the most poisonous we know; the juice, which is at first like milk, turns afterward to a Saffron colour: if a person should swallow ever so little of this juice, it will so contract every part it touches, that there will immediately follow a terrible inflammation and gangrene; and, which is worse, there has not yet been found any antidote against it; for which reason we ought to be very careful to know this plant, in order to avoid it, for fear we should take it for any other like it, which would certainly prove fatal.

The poisonous quality of this plant hath led some persons to believe it to be the *Cicuta* of the ancients; but according to *Wepfer*, the *Sium alterum olusatrici facie* of *Lobel*, is what the ancients called *Cicuta*, as may be seen at large in *Wepfer's* book *de Cicuta*.

The second sort is very common in moist soils, and by the sides of rivers in divers parts of *England*: this is not supposed to be near so strong as the first, but is of a poisonous quality.

All the sorts of these plants naturally grow in moist places, so that whoever hath a mind to cultivate them, should sow their seeds soon after they are ripe in autumn, upon a moist soil, where they will come up, and thrive exceedingly the following summer, and require no farther care but to clear them from weeds.

CENOTHERA. *Lin. Gen. Plant.* 424. Tree, or Night Primrose.

The Characters are,

The empalement of the flower is of one leaf, cut into four acute segments at the brim, which turn backward. The flower has four heart-shaped petals, which are lengthways inserted in the divisions of the empalement. It hath eight awl-shaped incurved stamina, which are inserted in the tube of the empalement. The cylindrical germen is situated under the tube of the empalement, supporting a slender style crowned by a thick, quadrifid, obtuse, reflexed stigma. The germen afterward becomes a four-cornered cylindrical capsule, having four cells, which are filled with small angular seeds.

The Species are,

1. *CENOTHERA foliis ovato-lanceolatis.* *Vir. Cliff.* 33. Tree Primrose with plain, oval, spear-shaped leaves.

2. *CENOTHERA foliis lanceolatis dentatis, caule hispido.* Tree Primrose with spear-shaped indented leaves, and a prickly stalk.

3. *CENOTHERA foliis lanceolatis planis, caule glabro.* Tree Primrose with plain spear-shaped leaves, and a smooth stalk.

4. *CENOTHERA foliis lanceolatis undulatis.* *Vir. Cliff.* 33. Tree Primrose with waved spear-shaped leaves.

5. *CENOTHERA foliis radicalibus ovatis, caulinis lanceolatis obtusis, capsulis ovatis sulcatis.* *Tab.* 188. Tree Primrose with oval leaves at the root, those on the stalks spear-shaped and blunt-pointed, and oval furrowed seed vessels.

The other species which have been formerly placed in this genus, are now under *JUSSIAE* and *LUDWIGIA*, to which the reader is desired to turn.

The three first sorts grow naturally in *Virginia*, and in other parts of *North America*, from whence their seeds were brought to *Europe* in the beginning of the sixteenth century; but they are now become so common in many parts of *Europe*, as to be taken for natives. The first hath a long, thick, taper root, which runs deep into the ground, from which arise many oblong leaves which spread flat on the surface of the ground; between these the stalk comes out, which rises between three and four feet high; the stalk is of a pale green colour, a little hairy, and about the thickness of a finger, full of pith; this is garnished with long narrow leaves set close to the stalk without order. The flowers are produced all along the stalk from the wings of the leaves, the germen sitting close to the stalk, from the top of which arises the tube of the flower, which is narrow; at the top is the empalement, which is cut into four acute segments, reflexed downward. The petal of the flower is cut into four large obtuse segments, which in the evening are expanded quite flat, but are shut in the day; these are of a bright yellow colour. From the flower opening in the evening, many persons call it the Night Primrose. The plants begin to flower about *Midsummer*, and as the stalks advance in height, so other flowers are produced, whereby there is a succession of flowers on the same plant till autumn.

The second sort hath red stalks, which are set with rough protuberances; it does not rise so high as the first, the leaves are narrower, and the flowers are smaller.

The third sort differs from the first, in having shorter stalks, narrower leaves, and smaller flowers; and from the second, in having smooth stalks, which are of a pale green colour. These differences are permanent, so they are undoubtedly different species.

The fourth sort grows naturally at *Buenos Ayres*. This hath a shrubby stalk more than two feet high, garnished with narrow, hairy, spear-shaped leaves, ending in acute points, a little waved on their edges. The flowers come out from the wings of the leaves along the stalks, like the other sorts; they are first of a pale yellow, but as they decay change to an Orange colour; they are smaller than those of either of the former sorts, and expand only in the evening; the seed vessels are slender, taper, and hairy. This flowers at the same time with the former.

The fifth sort grows naturally in *Canada*, from whence the seeds were brought to *Paris* a few years past. This is a perennial plant, the root is fibrous; the lower leaves are oval and small, sitting close to the ground; the stalk is slender, near a foot high, and is garnished with small spear-shaped leaves, of a light green, ending in blunt points, sitting close to the stalks. The flowers come out from the wings of the leaves like the other species; these are small, of a bright yellow colour, and appear at the same time as the former, and are succeeded by short, oval, furrowed seed-vessels, filled with small seeds.

The three first sorts are very hardy plants, which if once brought into a garden, and the seeds permitted to scatter, there will be a supply of plants without any care. They are biennial, and perish after they have perfected their seeds. The seeds of these plants should be sown in the autumn, for those which are sown in the spring seldom rise the same year; when the plants come up, they should be thinned.

and

and kept clean from weeds, which is all the care they require till the autumn, when they should be transplanted to the places where they are designed to flower; but as the roots of these plants strike deep in the ground, so there should be care taken not to cut or break them in removing. The plants will thrive in almost any soil or situation, and will flower in *London* in small gardens, better than most other plants.

The fourth sort is now become pretty common in the *English* gardens, for if the seeds of this are permitted to scatter, the plants will come up the following spring, and require no other care but to keep them clean from weeds, and thin them where they grow too close. If these plants are kept in pots, and placed in a green-house in the autumn, they will live through the winter; but as they produce flowers and seeds in the open air, the plants are seldom preserved longer.

The fifth sort is perennial, and may be propagated either by parting of the roots or by seeds; if it is by the former, the best time for doing it is in the spring, but if they are propagated by seeds, these should be sown in the autumn; and the surest way is to sow the seeds in pots, and place them under a hot-bed frame in winter; in the spring the plants will appear, and when they are fit to remove, a few of them may be planted in small pots, to be sheltered under a common frame in the winter; and the others may be planted in a sheltered border, where they will endure the cold of our ordinary winters very well, and the following summer they will produce flowers and seeds in plenty, so there will be little occasion for parting of their roots, because the seedling plants will be much stronger and flower better than those propagated by offsets.

OLDENLANDIA. *Plum. Nov. Gen.* 42. *tab.* 36.

The Characters are,

The empalement of the flower is permanent, sitting upon the germen. The flower has four oval petals, which spread open, and four stamina terminated by small summits. It hath a roundish germen situated under the flower, crowned by an indented stigma. The germen after-ward turns to a globular capsule with two cells, filled with small seeds.

We have but one Species of this plant in the *English* gardens, viz.

OLDENLANDIA *pedunculis multifloris, foliis linearilanceolatis*: *Lin. Sp. Plant.* 119. Oldenlandia with many flowers on a foot-stalk, and linear spear-shaped leaves.

The seeds of this plant were sent into *England* by Mr. Robert Millar, who gathered them in *Jamaica*. It is a low annual plant, which divides into many branches, spreading upon the ground. These branches are garnished with long narrow leaves, placed opposite. From the wings of the leaves arises the flower-stalk, which grows about an inch, or a little more in length, and divides into three or four smaller foot-stalks; on the top of each of these stands one small white flower.

The seeds of this plant should be sown early in the spring on a hot-bed, and when the plants are come up, they should be transplanted on another hot-bed, or into small pots, and plunged into a moderate hot-bed of tanners-bark, observing to water and shade them until they have taken root; after which time they must have a large share of free air in warm weather, and must be frequently refreshed with water. With this management the plants will flower in *June*, and their seeds will ripen soon after, so that the seeds must be gathered from time to time as they ripen; for as the branches grow larger, so there will be fresh flowers produced until autumn, when the plants will perish; but if the seeds are permitted to scatter in the pots, the plants will soon after appear, which will live through the winter, provided they are placed in the stove, and will flower early the following spring.

OLEA: *Tourn. Inst. R. H.* 598. *tab.* 370. The Olive.

The Characters are,

It has a small tubulous empalement of one leaf, cut into four segments at the top. The flower consists of one petal, which is tubulous, cut at the brim into four segments. It has two short stamina terminated by erect summits, and a roundish germen supporting a short single style, crowned by a thick bifid stigma. The germen after-ward turns to an oval smooth fruit (or berry) with one cell, inclosing an oblong oval nut.

The Species are,

1. OLEA *foliis linearilanceolatis subtus incanis*. Olive with linear spear-shaped leaves, which are hoary on their under side; commonly called *Provence* Olive.

2. OLEA *foliis lanceolatis, fructu ovato*. Olive with spear-shaped leaves, and an egg-shaped fruit; called the *Spanish* Olive.

3. OLEA *foliis lanceolatis obtusis rigidis, subtus incanis*. Olive with spear-shaped, obtuse, rigid leaves, which are hoary on their under side; or the *Wild* Olive.

4. OLEA *foliis lanceolatis lucidis, ramis teretibus*. Olive with spear-shaped shining leaves, and taper branches; called *African* Olive.

5. OLEA *foliis ovatis rigidis sessilibus*. Olive with oval stiff leaves, sitting close to the branches; commonly called *Box-leaved* Olive.

The first sort is what the inhabitants of the south of *France* chiefly cultivate, because from this species the best Oil is made, which is a great branch of trade in *Provence* and *Languedoc*; and it is the fruit of this sort, which is most esteemed when pickled: of this there are some varieties; the first is called *Olive Picholine*; there is another with dark green fruit, one with white fruit, and another with smaller and rounder fruit; but as these are supposed to be only accidental varieties, which have risen from the same seeds, I have not enumerated them.

The Olive seldom rises to be a large tree, and is rarely seen with a single stem, but frequently two or three stems rise from the same root; these grow from twenty to thirty feet high, putting out branches from their sides almost their whole length, which are covered with a gray bark, and garnished with stiff leaves, of a lively green on their upper side, and hoary on their under, standing opposite. The flowers are produced in small bunches from the wings of the leaves; they are small, white, and have short tubes, spreading open at the top; these are succeeded by oval fruit, which, in warm countries, ripen in the autumn.

The second sort is chiefly cultivated in *Spain*, where the trees grow to a much larger size than the former sort; the leaves are much larger, and not so white on their under side; and the fruit is near twice the size of those of the *Provence* Olive, but are of a strong rank flavour, and the oil made from these is too strong for most *English* palates.

The third sort is the *Wild* Olive, which grows naturally in woods, in the south of *France*, *Spain*, and *Italy*, so is never cultivated; the leaves of this sort are much shorter and stiffer than those of the other; the branches are frequently armed with thorns, and the fruit is small and of no value.

The fourth and fifth sorts grow naturally at the *Cape of Good Hope*; the fourth rises to the height of the first, to which it bears some resemblance, but the bark is rougher; the leaves are not so long, and are of a lucid green on their upper side; but as this does not produce fruit in *Europe*, I can give no account of it.

The fifth sort is of humbler growth, seldom rising more than four or five feet high, sending out branches from the root upward, forming a bushy shrub; the branches are taper, and covered with a gray bark; the leaves are oval, very stiff, and smaller than those of the other species. This has not produced any fruit in *England*.

All these sorts are preserved in the gardens of the curious, but they are rather too tender to thrive in the open air, in the neighbourhood of *London*, where they are sometimes planted against walls, and with a little protection in very severe frost, they are maintained pretty well; but in *Devonshire* there are some of these trees, which have grown in the open air many years, and are seldom injured by the frost, but the summers are not warm enough to bring the fruit to maturity. There were several of these trees planted against a warm wall at *Cambden-house*, near *Kensington*, which succeeded very well, till their tops were advanced above the wall; after which they were generally killed in winter, so far down as to the top of the wall. These in 1719 produced a good number of fruit, which grew so large as to be fit for pickling; but since that time, their fruit has seldom grown to any size.

In *Languedoc* and *Provence*, where the Olive tree is greatly cultivated, they propagate it by truncheons split from the roots of the trees; for as these trees are frequently hurt by hard frosts in winter, so when the tops are killed, they send up several stalks from the root; and when these are grown pretty strong, they separate them with an ax from the root, in the doing of which they are careful to preserve a few roots to the truncheons; these are cut off in the spring, after the danger of frost is over, and planted about two feet deep in the ground, covering the surface with litter or mulch, to prevent the sun and wind from penetrating and drying of the ground; when the plants have taken new root, they are careful to stir the ground, and destroy the weeds.

This tree will grow in almost any soil, but when it is planted in rich moist ground, they grow larger and make a finer appearance, than in poor land; but the fruit is of less esteem, because the oil made from it, is not so good as that which is produced in a leaner soil. The chalky ground is esteemed the best for these trees, and the oil which is made from the trees growing in that sort of land is much finer, and will keep longer than the other.

In the countries where the inhabitants are curious in the making of their oil, they are frequently obliged to get truncheons of the ordinary sorts of Olives to plant; but after they have taken good root, they graft them with that sort of Olive which they prefer to the others. In *Languedoc* they chiefly propagate the *Cormeau*, the *Ampoulan*, and *Moureau*, which are three varieties of the first species: but in *Spain* the second sort is generally cultivated, where they have more regard to the size of the fruit, and the quantity of oil they will produce, than to their quality.

In *England* the plants are only preserved by way of curiosity, and are placed in winter in the green-house for variety, so I shall next give an account of the method by which they are here propagated, with their manner of treatment.

These plants may be propagated by laying down their tender branches (in the manner practised for other trees), which should remain undisturbed two years; in which time they will have taken root, and may then be taken off from the old plants, and transplanted either into pots filled with fresh light earth, or into the open ground in a warm situation. The best season for transplanting them is the beginning of *April*, when you should, if possible, take the opportunity of a moist season; and those which are planted in pots, should be placed in a shady part of the green-house until they have taken root; but those planted in the ground should have mulch laid about their roots, to prevent the earth from drying too fast, and now and then refreshed with water; but you must by no means let them have too much moisture, which will rot the tender fibres of their roots, and destroy the trees. When the plants have taken

fresh root, those in the pots may be exposed to the open air, with other hardy exoticks, with which they should be housed in winter, and treated as *Myrtles*, and other less tender trees and shrubs; but those in the open air will require no farther care until the winter following, when you should mulch the ground about their roots, to prevent the frost from penetrating deep into it; and if the frost should prove very severe, you should cover them with mats, which will defend them from being injured thereby; but you must be cautious not to let the mats continue over them after the frost is past, lest by keeping them too close, their leaves and tender branches should turn mouldy for want of free air, which will be of as bad consequence to the trees, as if they had been exposed to the frost, and many times worse; for it seldom happens, if they have taken much of this mould, or have been long covered, so that it has entered the bark, that they are ever recoverable again; whereas it often happens, that the frost only destroys the tender shoots; but the body and larger branches remain unhurt, and put out again the succeeding spring.

These trees are generally brought over from *Italy* every spring, by the persons who bring over *Oranges*, *Jasmines*, &c. from whom they may be procured pretty reasonable; which is a better method than to raise them from layers in this country, that being too tedious; and those which are thus brought over, have many times very large stems, to which size young plants in this country would not arrive in ten or twelve years growth. When you first procure these stems, you should (after having soaked their roots twenty-four hours in water, and cleaned them from the filth they have contracted in their passage) plant them in pots filled with fresh light earth, and plunge them into a moderate hot-bed, observing to screen them from the violence of the sun in the heat of the day, and also to refresh them with water, as you shall find the earth in the pots dry. In this situation they will begin to shoot in a month or six weeks after, when you should let them have air in proportion to the warmth of the season; and after they have made pretty good shoots, you should inure them to the open air by degrees, into which they should be removed, placing them in a situation where they may be defended from strong winds; in this place they should remain till *October* following, when they must be removed into the green-house, as was before directed. Having thus managed these plants until they have acquired strong roots, and made tolerable good heads, you may draw them out of the pots, preserving the earth to their roots, and plant them in the open air in a warm situation, where you must manage them as was before directed for the young ones, and these will in two or three years produce flowers, and in very warm seasons some fruit, provided they do well. The *Lucca* and *Box-leaved Olives* are the hardiest, for which reason they should be preferred to plant in the open air, but the first sort will grow to be the largest trees.

OMPHALODES. See *Cynoglossum*.

ONAGRA. See *Oenothera*.

ONIONS. See *Cepa*.

ONOBRYCHIS. *Tourn. Inst. R. H. 390. tab. 211.* Cock's Head, or Saintfoin.

The Characters are,

The empalement of the flower is permanent, cut into five parts at the top. The flower is of the butterfly kind. The standard is oblong, reflexed, and indented at the top. The wings are oblong and erect. The keel is compressed, broad at the end, and bifid at the base. It has ten angular stamina, nine joined, and one separate, and a narrow compressed germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes a compressed roundish pod, which opens with two valves, inclosing one kidney-shaped seed.

The *Species* are,

1. *ONOBRYCHIS foliis pinnatis, leguminibus aculeatis, corollarum alis calyce brevioribus.* Cocks Head with winged leaves, prickly pods, and the wings of the flowers shorter than the empalment; or common Saintfoin.

2. *ONOBRYCHIS foliis pinnatis, leguminibus aculeatis, petalis æqualibus.* Cocks Head, or Saintfoin with winged leaves, prickly pods, and equal petals to the flowers.

3. *ONOBRYCHIS foliis pinnatis, leguminibus rugosis, petalis æqualibus, calycibus brevissimis.* Cocks Head with winged leaves, rough pods, equal petals to the flowers, and very short empalements.

4. *ONOBRYCHIS foliis pinnatis, foliolis obtusis, leguminibus aculeatis, petalis subæqualibus.* Cocks Head with winged leaves, having obtuse lobes, prickly pods, and the petals of the flowers almost equal.

The first sort is commonly cultivated in the fields for fodder for cattle, and is a great improvement to chalky lands, where there would be very little natural grass produced, if it was encouraged; so that many estates have been improved since this, and other plants have been introduced to double their rent.

The roots of this plant are large, stringy, and run deep in the ground, from which come out several winged leaves, composed of eight or ten pair of oval lobes, placed opposite along the midrib, terminated by an odd one. The stalks rise near two feet high; these are garnished toward the bottom, with the like winged leaves, but the upper part of the stalk is naked to about six inches of the top, where they are terminated by spikes of soft red flowers, shaped like those of the *French Honey-suckle*, but smaller; these are succeeded by roundish, compressed, prickly pods, each having one kidney-shaped seed. It flowers in *June*, and the seeds are ripe in *September*, but the roots will continue many years; there are two or three varieties of this, which differ only in the colour of their flowers.

The second sort grows naturally in *Sicily* and *Spain*; this is an annual plant, which perishes soon after it has perfected seeds. It has a jointed stalk, a foot and a half high; from each joint comes out one winged leaf, composed of six or eight small oval lobes, terminated by an odd one, and close to the base of the leaf, arises a naked foot-stalk, four or five inches long, sustaining at the top a few small purplish flowers, shaped like those of the former sort, but the petals are of equal length; they are succeeded by larger pods than those of the first, which are crested, and armed with stronger prickles. It flowers the latter end of *June*, and the seeds ripen in autumn.

The third sort grows naturally in *Italy*; this hath a perennial root, which runs deep in the ground, from which arise several slender branching stalks, a foot and a half high, garnished with winged leaves, composed of nine or ten pair of narrow lobes, terminated by an odd one. The stalks are terminated by long loose spikes of pale red flowers, which are much smaller than those of the first sort, whose petals are almost equal in length; these are succeeded by small, rough, crested pods, which are not armed with prickles. It flowers and ripens seeds about the same time as the first.

The fourth sort grows naturally in the island of *Crete*; this has a perennial root like the first. The stalks are stronger, and rise near two feet high; they are garnished with winged leaves, composed of nine or ten pair of lobes, terminated by an odd one. The lobes of this sort are broader than those of the first sort, and end in obtuse points; they are of a deep green, and stand more erect. The flowers are produced in pretty long spikes; they are of a pale red colour, and as large as those of the first, their petals are almost of equal length; these are succeeded by

larger, compressed, crested pods than those of the first, which are strongly armed with prickles. It flowers in *July*, and the seeds ripen in autumn.

The first is an abiding plant, which, if sown upon a dry, gravelly, or chalky soil, will continue eighteen or twenty years, without renewing; but if it be sown upon a deep, light, moist soil, the roots will run down into the ground, and in the winter season the moisture will rot them, so that it seldom lasts above two years in such places.

This is esteemed one of the best sorts of fodder for most cattle, and is a great improvement to chalky hills, upon which it succeeds better than in any other soil, and will continue many years, provided there is a surface of six or eight inches upon the chalk.

The season for sowing of this seed is in the beginning, or middle of *April*, according as the season is early or late, observing always to do it in dry weather, otherwise the seed will be apt to burst with moisture, and never come up. These seeds being large, there will require a greater quantity in measure to sow an acre, than of many other sorts; the common allowance is four bushels to an acre, but I would not advise above three at most; and if the seeds were sown in rows, in the manner directed for the *Medica*, it would be a great improvement to the plants, for when they have room enough, they are very subject to branch out on every side, and become very strong; so that where they are in rows, that the ground between them can be stirred with a hoe plough, it will cause them to shoot much stronger than when they grow so close, that there can be no culture bestowed on them; and by hoeing between the plants, the natural grass will be kept down, which, if permitted to grow, will rob the Saintfoin of its nourishment, and in time destroy it.

I have taken up roots of this kind, where they have grown singly, and been kept clear from weeds, whose shoots have spread near two feet wide, and were much stronger than those which grew nearer together upon the same soil.

There are some persons who recommend the sowing Oats or Barley with this seed; but that is a very bad method, for what is gained from the crop of Corn, will be doubly lost in the Saintfoin; and this generally holds true in most sorts of Grass seeds, for the Corn growing over it doth so weaken the crop beneath, that it scarcely recovers its strength in a years time after.

The ground in which this seed is sown, should be well ploughed, and made very fine; and if you sow it in rows, the drills should be made eighteen inches asunder, and about an inch deep, in which the seeds should be sown indifferently thick; for if the plants come up too close, it will be very easy to hoe them out, so as to leave the remaining ones six or eight inches asunder, for the ground should be hoed after the plants are come up, to destroy the weeds, which, if suffered to grow, would soon overbear the young plants, and destroy them; but when the plants have obtained strength, they will prevent the weeds from growing up amongst them.

The first year after sowing, you should by no means feed it down, for the crown of the roots being then young and tender, the cattle would eat it so low, as to entirely destroy the roots; and if large cattle were let in upon it, they would trample it down so much as to prevent its shooting again; therefore the first year it should be mowed, which should be done when it is in flower.

The sooner this is carried off the ground, when cut, it will be the better for the plants, so that if it were carried on a neighbouring ground to be made, the second crop would come up sooner and stronger; this doth not require to be so often turned as other Hay, for as the stalks are larger

larger, they will not lie so close in the cocks as to ferment; therefore in catching weather, the cocks may be made large, and if they are turned and spread every other day, or once in three days, there will be little danger of its heating, so as to receive damage; but if it is spread, and much exposed to rain and dews, the goodness of the Hay will be exhausted.

The time when this crop will be fit to cut the first year, is toward the latter end of *July*, or the beginning of *August*. After this is cleared off, the roots will soon shoot again, and by the end of *September*, provided the season be favourable, there will be a fine crop fit for feeding; at which time, or soon after, you may turn in sheep, which will, in eating down the grass, enrich the ground with their dung, whereby the roots will be greatly strengthened; but you should not suffer them to remain too long upon it, as I before observed, lest they should eat it down too low, which would destroy the roots; nor should they ever be suffered to remain upon it longer than the middle of *November* the first year; and the succeeding years, when the crop is early cut, it should not be fed longer than the middle of *September*.

There are some who cut two crops of this Hay in a year, but the latter crop is seldom of much value, and this weakens the roots, for which reason it should not be practised. When the seeds of Saintfoin are to be saved, the crop should not be fed too low the foregoing autumn, for that will occasion the stalks to be weak, therefore the best husbandry is not to feed it the season before, for I have made trial of two rows of plants standing by each other, one of which I cut down in *September*, with care, so as not to cut any buds for the future shoots; the other row I left untouched, and the following spring I found those plants which were not cut, put out earlier and stronger, and the stalks grew taller than those which were cut, and the plants produced a greater quantity of seeds, which were ripe a fortnight sooner.

The Hay which is made from the plants saved for seed, is of but little value, being no better fodder than chopped Straw, or chaff, so that those who are desirous to have the Hay in perfection, should cut it just before it begins to flower, when it abounds more with juice, and will nourish cattle much more than that which stands to be full in flower.

This sort of Hay is exceeding good for horses, and is esteemed one of the best sorts of food for most cattle, especially in the spring, there being no danger attending it, as there is in Clover, and some other sorts of fodder; it breeds abundance of milk, and the butter that is made of it is very good.

Since this plant has been introduced into *England*, there have been many dairy farms set up, in such places where it was formerly thought impracticable; and if this plant, and the Lucern, were properly cultivated, there might be yet much greater improvements made; for hereby not only a much greater quantity of milch cows might be maintained, but also a greater number of black cattle might be fattened, and more sheep and hogs, which would be a great improvement to many estates in the hilly countries, for by increasing of the live stock, there will be an addition of manure for dressing the arable land.

The other sorts of this plant are preserved in botanick gardens for variety, but as they have little beauty or use, they are rarely admitted into other gardens. The second sort being an annual plant, the seeds must be sown on an open border every spring, where the plants are to remain for good, and will require no other care, but to thin the plants, and keep them clean from weeds; the other sorts require no other culture than the first, as their roots last many years.

ONONIS. *Lin. Gen. Plant.* 772. Rest-harrow, Cammock, Petty-whin.

The Characters are,

The empalement of the flower is cut into five narrow segments, the upper being a little raised and arched, the lower bending under the keel. The flower is of the butterfly kind. The standard is heart-shaped, and larger than the wings. The wings are oval and short; the keel is pointed, and longer than the wings. It hath ten stamina joined together, and an oblong hairy germen, supporting a single style, crowned by an obtuse stigma. The germen afterward becomes a turgid pod with one cell, inclosing kidney-shaped seeds.

The Species are,

1. ONONIS floribus subsessilibus solitariis lateralibus, caule spinoso. *Hort. Cliff.* 359. Rest-harrow with single flowers sitting close to the sides of the branches, and a prickly stalk; called Cammock, or Petty-whin.

2. ONONIS floribus subsessilibus solitariis lateralibus, ramis inermibus. *Hort. Cliff.* 359. Rest-harrow with single flowers sitting close to the stalks, and branches without spines.

3. ONONIS caulibus procumbentibus, floribus subsessilibus solitariis, foliis hirsutis. Rest-harrow with trailing stalks, single flowers sitting close to the branches; and hairy leaves.

4. ONONIS foliis ternatis carnosis sublinearibus tridentatis. *Lin. Sp. Plant.* 718. Rest-harrow with trifoliate fleshy leaves, which are narrow, and have three indentures.

5. ONONIS floribus paniculatis, pedunculis subtrifloris, stipulis vaginalibus, foliis ternatis. *Hort. Cliff.* 358. Rest-harrow with paniculated flowers, generally growing three upon a foot-stalk sheath-like stipulæ, and trifoliate leaves; or purple shrubby Rest-harrow.

6. ONONIS pedunculis unifloris filo terminatis foliis ternatis. *Hort. Cliff.* 358. Rest-harrow with one flower on a foot-stalk, which is terminated by a thread and trifoliate leaves.

7. ONONIS pedunculis unifloris, filo terminatis, caule ramoso villoso, foliis ternatis serratis. Rest-harrow with one flower on each foot-stalk, which are terminated by a thread, a branching hairy stalk, and trifoliate sawed leaves; or broad-leaved erect Rest-harrow of *Portugal*.

8. ONONIS floribus sessilibus lateralibus, foliis omnibus ternatis petiolatisque, stipulis setaceis. *Lin. Sp. Plant.* 717. Rest-harrow with flowers sitting close to the sides of the stalks, all the leaves trifoliate, growing upon foot-stalks, and bristly stipulæ.

9. ONONIS pedunculis bifloris, filo terminatis. *Prod. Leyd.* 376. Rest-harrow with two flowers on a foot-stalk, which are terminated by a thread.

10. ONONIS pedunculis axillaribus trifloris nudis, foliis ternatis. *Hort. Cliff.* 358. Rest-harrow with naked foot-stalks proceeding from the sides of the branches, and sustaining three flowers, and trifoliate leaves.

11. ONONIS pedunculis quinquefloris axillaribus, caulibus diffusis procumbentibus, foliis ternatis, leguminibus lunulatis. Rest-harrow with five flowers on a foot-stalk, proceeding from the sides of the branches, diffused trailing stalks, trifoliate leaves, and moon-shaped pods.

12. ONONIS stipulis floralibus ovatis membranaceis integerrimis. *Prod. Leyd.* 376. Rest-harrow with oval, entire, membranaceous stipulæ to the flowers.

13. ONONIS foliis ternatis lanceolato-ovatis integerrimis, caule erecto herbaceo, racemo terminali. Rest-harrow with trifoliate, spear-shaped, oval, entire leaves, and an erect herbaceous stalk, terminated by a loose spike of flowers; called *Carolina* Rest-harrow.

14. ONONIS spicis foliosis simplicibus obtusis. *Lin. Sp. Plant.* 717. Rest-harrow with leafy spikes, and single obtuse leaves.

15. ONONIS foliis ternatis ovatis, petiolis longissimis, leguminibus hirsutis. Rest-harrow with oval trifoliate leaves, growing on very long foot-stalks, and hairy pods.

The first sort is a common weed in most parts of *England*, so is rarely admitted into gardens. It has a strong creeping root,

root, which spreads far in the ground, and is with great difficulty eradicated; the stalks rise two feet and a half high, they are slender, reddish, and hairy, sending out small branches on their side, which are armed with sharp prickles. The flowers come out single from the side of the branches, they are of the butterfly kind, of a purple colour, which are succeeded by small pods, containing one or two kidney-shaped seeds. It flowers great part of summer, and the seeds ripen in the autumn. The root of this is one of the five opening roots; the cortical part of it is esteemed a good medicine for stoppage of urine, and to open the obstructions of the liver and spleen; there is a variety of this with white flowers.

The second fort grows naturally in many parts of *England*, and has been by some supposed to be only a variety of the first; but I have cultivated both by seeds, and have always found the plants retain their difference; the stalks of this fort are hairy, and more diffused than those of the first; the leaves are broader, and sit closer on the branches; the stalks grow more upright, and have no spines; the flowers and pods are like those of the first. There is also a variety of this with white flowers.

The third fort grows naturally on the borders of the sea in several parts of *England*; this hath a creeping root, from which arise many hairy stalks, which are near two feet long, spreading on every side upon the ground, garnished with trifoliate hairy leaves, those on the lower part of the stalks being pretty large and oval, but the upper are smaller and narrower. The flowers are like those of the first in shape, coming out singly from the side of the stalks, but are of a brighter purple colour; the pods are short, containing two or three seeds in each. It flowers in *July*, and the seeds ripen in autumn.

The fourth fort grows naturally in *Spain* and *Portugal*; this rises with shrubby stalks two feet and a half high, dividing into slender branches, very full of joints, garnished with narrow, trifoliate, thick, fleshy leaves, standing upon short foot-stalks. The flowers are produced at the end of the branches in loose panicles, some of the foot-stalks sustaining two, and others but one flower; they are of a fine purple colour, and appear in *June*; the seeds ripen in *September*.

The fifth fort grows naturally on the *Alps*, this is a very beautiful low shrub; it rises with slender shrubby stalks about three feet high, dividing into many branches, which are garnished with narrow trifoliate leaves sawed on their edges, sitting close to the branches. The flowers come out in panicles at the end of the branches upon long foot-stalks, which for the most part sustain three large purple flowers; the stipula is a kind of sheath, embracing the foot stalk of the flower. It flowers in *May*, and the flowers are succeeded by turgid pods about an inch long, which are hairy, inclosing three or four kidney-shaped seeds, which ripen in *August*.

The sixth fort grows naturally in the south of *France* and in *Spain*; this hath a perennial root and an annual stalk, which rises near two feet high, sending out short branches from the side of the lower part; these are garnished with trifoliate oblong leaves, which are hairy and clammy. The flowers grow in loose spikes at the end of the stalks, they are large, and of a bright yellow colour, standing upon pretty long foot-stalks, which are extended beyond the flowers, the flowers hanging downward from the middle of the foot-stalk. The flowers appear the latter end of *June*, which are succeeded by turgid pods an inch long, containing three or four brown kidney-shaped seeds, which ripen in *September*.

The seventh fort grows naturally in *Portugal*, from whence the seeds were sent to me. This is an annual plant,

with a strong, herbaceous, hairy stalk, rising a foot and a half high, sending out branches the whole length, closely garnished with trifoliate leaves; the middle lobe being large and oval, the two side lobes long and narrow, rounded at their points and indented on their edges; they are very clammy. The foot-stalks of the flowers come out from the wings of the stalks singly, each sustaining one pale yellow flower, standing erect in the middle of the foot-stalk, which is extended beyond the flower. This plant flowers in *July*, and the seeds ripen in the autumn.

The eighth fort grows naturally in the south of *France* and *Italy*; this is an annual plant, the stalks rise about nine inches high, sending out one or two side branches toward the bottom; the leaves are small, trifoliate, and oval, standing upon pretty long foot-stalks, and are indented on their edges. The flowers come out singly at the wings of the stalk, they are small, yellow, and sit very close to the stalk, having a sharp bristly stipula under the empalement; the pods are very short and turgid, containing two or three kidney-shaped seeds. It flowers in *July*, and the seeds ripen in the autumn.

The ninth fort grows naturally in *Sicily*, and is an annual plant; the stalks rise about nine inches high, sending out one or two branches toward the bottom; these are garnished with small trifoliate leaves, which stand on short foot-stalks. The flowers come out from the side of the branches upon short foot-stalks, each sustaining two small yellow flowers, which are succeeded by jointed compressed pots, like those of Bird's-foot, having four or five kidney-shaped seeds in each. This fort flowers in *July*, and the seeds ripen in the autumn.

The tenth fort grows naturally on the *Alps* and *Helvetian* mountains; this rises with a single jointed stalk a foot and a half high, garnished with oval, indented, trifoliate leaves, standing on pretty long foot-stalks. The foot-stalks of the flowers come out from the wings of the leaves, they are long, slender, each sustains three pale yellow flowers, which are succeeded by short turgid pods, containing two or three seeds in each. It flowers in *June*, and the seeds ripen in *September*.

The eleventh fort grows naturally in *Virginia*, from whence I received the seeds. This is a biennial plant, from the root comes out many diffused stalks which trail upon the ground, garnished with roundish trifoliate leaves indented on their edges, having short foot-stalks, they are of a light green and smooth. The flowers come out toward the end of the branches upon very slender foot-stalks, which arise from the wings of the leaves, each sustaining five small yellow flowers; these are succeeded by compressed pods shaped like a half-moon, or Medick Trefoil. This flowers in *July*, and the seeds ripen in autumn.

The twelfth fort came up in earth which was brought from *Barbados*, but it does not seem to be a native of that country, for it rises easily from seeds in the open air here, and perfects its seeds in the autumn, nor will it thrive in greater warmth. This hath an upright stalk a foot and a half high, sending out small side branches, which are garnished with roundish trifoliate leaves sawed on their edges, standing upon short foot-stalks. The flowers grow in short leafy spikes at the end of the branches, they are small, and of a pale purple colour, appearing in *July*, and are succeeded by short turgid pods, containing two or three kidney-shaped seeds which ripen in autumn.

The thirteenth fort grows naturally in *Carolina*, from whence Mr. *Catesby* sent the seeds to *England*. This hath a perennial root and an annual stalk; from the root arises three, four, or five stalks, in proportion to the size of the root, which grow from two to three feet high; they are smooth, herbaceous, and each divides toward the top into two or three

three branches, garnished with trifoliate leaves, whose lobes are oval, spear shaped, and entire. The stalks are terminated by loose spikes of white flowers near a foot long, which are ranged alternately, and stand upon short foot-stalks; these are succeeded by smooth turgid pods an inch and a half long, inclosing four or five large kidney-shaped seeds. This flowers in *June*, and the seeds ripen in *September*. There is a variety of this with blue flowers.

The fourteenth sort grows naturally in *Portugal, Spain, and Italy*. This is an annual plant, rising with upright branching stalks a foot high, garnished with single leaves sitting close to the stalks; the larger leaves are oval, about one inch long, and three quarters of an inch broad; the upper leaves are narrow, ending in obtuse points, and are slightly indented at their ends. The flowers grow in leafy spikes at the end of the stalks set close together, having hairy empalements; they are pretty large, of a purple colour, and appear in *July*; these are succeeded by taper pods about an inch long, inclosing four or five kidney-shaped seeds. This plant has several titles, in the different books of botany.

The fifteenth sort grows naturally in the *American* islands. This is an annual plant, rising with a branching stalk two feet high, garnished with trifoliate leaves, whose lobes are oval, standing upon very long foot-stalks, which are hairy. The flowers grow in loose spikes at the end of the branches; they are large, of a purplish yellow colour, and are succeeded by very turgid hairy pods, each containing five or six large kidney-shaped seeds. This sort flowers in *July* and *August*, and the seeds ripen in the autumn. From this plant indigo was formerly made, which, I suppose, was of less value than that which is made of Anil, so has not been for many years past cultivated in any of the islands.

The three first sorts are never cultivated in gardens; these are very troublesome weeds whenever they get into the fields, for the roots spread and multiply greatly in the ground, and are so tough and strong, that the plough will scarcely cut through them, so are with great difficulty eradicated when they have once gotten possession.

The fourth and fifth sorts are low shrubby plants, which are propagated by seeds. The fourth is too tender to thrive in the open air in *England*, unless it is planted in a warm situation, and in very severe frost covered to protect it. If the seeds of both sorts are sown upon a bed of light earth in *April*, the plants will come up in *May*, when they must be kept clean from weeds; and if they are too close, some of them should be carefully drawn up in moist weather, and transplanted at four or five inches distance; those of the fourth sort upon a warm sheltered border, but the fifth may be planted in a shady border, where they will thrive very well; after these have taken root, they will require no other care but to keep them clean from weeds till the following autumn, when they may be transplanted to the places where they are to remain; those plants which were left growing in the bed where they were sown, must also be treated in the same way. These plants will not thrive in pots, therefore should always be planted in the full ground, where the fifth sort will flourish greatly, and frequently send up many plants from their roots, but the other is more impatient of cold. These plants will flower the second year, and make a fine appearance during the continuance of their flowers, and the fifth sort will produce seeds in plenty.

The sixth sort is propagated by seeds, which should be sown thin in drills, upon a bed of light earth, and when the plants come up, they must be kept clean from weeds till the autumn, when they should be carefully taken up, and transplanted into the borders of the pleasure-garden, where they are to remain; the second year they will flower and produce ripe seeds, but the roots will continue some years, and are very hardy.

The seventh, ninth, and fourteenth sorts, are annual hardy plants; these are propagated by seeds, which should be sown in the places where the plants are to remain, and will require no other care but to thin them where they are too close, and keep them clean from weeds.

The eleventh sort is a biennial plant. The seeds of this should be sown on a bed of fresh earth, where the plants are to remain, and when they come up, if they are thinned where they grow too close, and are kept clean from weeds, they will require no other culture.

The thirteenth sort is propagated by seeds, which should be sown either on a moderate hot-bed or a warm border in the spring; and when the plants are fit to remove, they should be each transplanted into a separate small pot, plunging them into a gentle hot-bed, observing to shade them till they have taken new root, then they should be gradually inured to the open air; the latter end of *May*, or the beginning of *June*, they may be fully exposed to the open air, but in autumn they should be placed under a common hot-bed frame, to screen them from frost in winter. The spring following they may be shaken out of the pots, and planted in the full ground, where they are to remain. As these plants have long tap-roots, they will not thrive long in pots, and if they are planted in wet ground, their roots will rot in winter, but in a dry soil they are never hurt by cold, and their roots will abide many years.

The fourteenth sort is an annual plant; the seeds of this must be sown upon a moderate hot-bed in the spring, and, when the plants are fit to remove, they should be transplanted on another hot-bed, to bring the plants forward, treating them in the same way as the *African* and *French* Marigold. In *June* they should be taken up with balls of earth to their roots, and transplanted into the open borders, where, if they are shaded till they have taken root, they will thrive and flower the following month, and perfect their seeds in autumn.

ONOPORDUM. *Lin. Gen. Plant.* 834. Woolly Thistle.

The Characters are,

The common empalement is roundish, bellied, and imbricated. The flower is composed of many hermaphrodite florets, which are funnel-shaped, equal, and uniform, having narrow tubes swelling at the brim, cut into five points; they have five short hairy stamina, terminated by cylindrical summits, and an oval germen crowned with down, supporting a slender style, terminated by a crowned stigma. The germen becomes a single seed crowned with down, sitting in the empalement.

The Species are,

1. ONOPORDUM *calycibus squarrosis, foliis ovato-oblongis sinuatis.* *Lin. Sp. Plant.* 827. Woolly Thistle with rough empalements, and oblong, oval, sinuated leaves; or common Woolly Thistle.

2. ONOPORDUM *calycibus squarrosis, foliis linearibus pinnatifidis.* *Lin. Sp. Plant.* 827. Woolly Thistle with rough empalements, and narrow leaves ending in many points.

3. ONOPORDUM *calycibus imbricatis.* *Hort. Upsal.* 249. Woolly Thistle with imbricated empalements.

4. ONOPORDUM *calycibus squarrosis, foliis oblongis, pinnatifidis decurrentibus, capite magno.* Woolly Thistle with rough empalements, oblong, sinuated, wing-pointed leaves running along the stalk, and a large head.

5. ONOPORDUM *foliis oblongo ovatis dentato-aculeatis capite sessili.* Woolly Thistle with oblong oval leaves, having prickly indentures, and a head sitting close to the ground.

The first sort grows naturally on uncultivated places in most parts of *England*. It is a biennial plant; the first year it puts out many large downy leaves, which are sinuated on their edges, and are prickly; these spread on the ground, and continue the following winter, and in the spring arifes the

the stalk in the middle of the leaves, which upon dunghills, or good ground, grows five or six feet high, dividing upward into many branches, which have leafy borders running along them; these are indented, and each indenture is terminated by a spine. The stalks are terminated by scaly heads of purple flowers, which appear in *June*; and to these succeed oblong angular seeds, crowned with a hairy down, which assist their spreading about to a great distance by the wind, so that where the plants are permitted to ripen their seeds, they often become troublesome weeds.

The second sort grows naturally in *Spain, Portugal, and the Levant*. This rises with a taller stalk than the former, the leaves are much longer and narrower, and the indentures on their sides are regular, ending in sharp spines. The heads of flowers are larger, and the spines of the empalement are longer than those of the first sort.

The third sort grows to the height of nine or ten feet; the stalks divide into many branches; the leaves are longer than of any other species; the heads of flowers are large and of a purple colour; the empalement hath the scales lying over each other like those of fish. This grows naturally in *Spain and Portugal*.

The fourth sort grows naturally about *Aleppo*. This rises with an upright branching stalk seven or eight feet high, the leaves are long, and regularly sinuated on their borders, like wing-pointed leaves. The heads of flowers are very large, and the empalement is very rough and prickly.

The fifth sort hath several oblong, oval, woolly leaves, which spread on the ground; between these comes out the head of flowers sitting close to the ground; these heads are smaller than any of the other, and the flowers are white. Some of these plants have been formerly cultivated for the table, but it was before the *English* gardens were well supplied with other esculent plants, for at present they are rarely eaten here. They require no culture, for if the seeds are permitted to fall, the plants will come up fast enough.

OPHIOGLOSSUM, Adders-Tongue.

This plant grows naturally in moist meadows, and is not easy to be made to thrive in gardens, so is rarely attempted.

OPHRYS. *Tourn. Inst. R. H. 437. tab. 250. Lin. Gen. Plant. 902.* Twyblade.

The Characters are,

It has a single stalk with a vague spatha. The flower hath no empalement; it consists of five oblong petals, which join so as to form a helmet, the under one is bifid. The nectarium is dependent, and keel-shaped behind; it hath two short stamina sitting on the pointal. It hath an oblong contorted germen situated under the flower, with a style adhering to the inner border of the nectarium. The germen afterward turns to an oval, three-cornered, obtuse capsule, with one cell opening with three valves, filled with small seeds like dust.

The Species are,

1. OPHRYS bulbo fibroso, caule bifolio, foliis ovatis, nectarii labio bifido. *Lin. Sp. Plant. 546.* Twyblade with a fibrous root, two oval leaves on the stalk, and a bifid lip to the nectarium; common Twyblade, or Twayblade.

2. OPHRYS bulbo fibroso, caule bifolio, foliis cordatis. *Lin. Sp. Plant. 946.* Twyblade with a fibrous root, and two heart shaped leaves on the stalk; or Smallest Twyblade.

3. OPHRYS bulbis fibroso fasciculatis, caule vaginato, nectarii labio bifido. *Lin. Sp. Plant. 945.* Twyblade with bulbous bunched roots, a sheath-like stalk, and a trifid lip to the nectarium; Birds Nest, or mis-shapen Orchis.

4. OPHRYS bulbis aggregatis oblongis, caule subfolioso, floribus secundis, nectarii labio indiviso. *Act. Upsal. 1740.* Twyblade with oblong clustered bulbs, a leafy stalk, fruitful flowers, and an undivided lip to the nectarium; white, sweet-scented, spiral Orchis, called Tripple Ladies Traces.

5. OPHRYS bulbo globofo, caule nudo, nectarii labio trifido.

Act. Upsal. 1740. Twyblade with a globular bulb, a naked stalk, and a trifid lip to the nectarium; yellow, sweet, or Musk Orchis.

6. OPHRYS bulbis subrotundis, caule folioso, nectarii labio lineari tripartito, medio elongato bifido. *Lin. Sp. Plant. 948.* Twyblade with roundish bulbs, a leafy stalk, and a narrow three-pointed lip to the nectarium, the middle segment of which is stretched out and bifid; or Man Orchis.

7. OPHRYS bulbis subrotundis, caule folioso, nectarii labio subquincelobo. *Lin. Sp. Plant. 948.* Twyblade with roundish bulbs, a leafy stalk, and the lip of the nectarium divided almost into five lobes; Greater Fly Orchis.

8. OPHRYS bulbis subrotundis, caule folioso, nectarii labio trifido. Twyblade with roundish bulbs, a leafy stalk, and a trifid lip to the nectarium; the common Humble Bee Orchis.

9. OPHRYS bulbis subrotundis, caule subfolioso, nectarii labio trifido hirsuto. Twyblade with roundish bulbs, a leafy stalk, and a hairy trifid lip to the nectarium; Humble Bee Satyrion with green wings.

The first sort grows naturally in woods, and sometimes in moist pastures, in several parts of *England*. The root is composed of many strong fibres, from which arise two oval veined leaves; between these arises a naked stalk about eight inches high, terminated by a loose spike of herbaceous flowers, resembling knats, composed of five petals, with a long bifid lip to the nectarium, with a crest or standard above, and two wings on the side. The flowers sit upon an angular germen, which afterward swells to a capsule, opening when ripe in six parts, and filled with small dusty seeds. This plant refuses culture, but may be transplanted, from the places where it grows naturally, into a shady part of the garden, where, if the roots are not disturbed, they will continue several years, and flower in *May*, but they do not increase in gardens. The best time to remove the roots is in *July or August*, when the leaves are decaying, for it will be difficult to find the roots after the leaves are gone.

The second sort is found in some of the northern counties in *England*, but is seldom seen growing in the south. This hath a small bulb with many strong fibres to the root, and sends out two small, ribbed, heart-shaped leaves at bottom. The stalk rises about four inches high, and is terminated by a spike of small herbaceous flowers shaped like those of the first sort.

The third sort grows naturally in shady woods in *Kent and Suffex*. This has sometimes a single bulbous root, and at others several joined together, from which arises a single stalk near a foot high, embraced the whole length with leaves like sheaths; the top of the stalk is garnished with a loose spike of flowers shaped like those of the Orchis, and of the colour of decayed leaves. It flowers in *June*.

The fourth sort grows upon chalky hills in several parts of *England*. This hath a globular bulbous root, from which arises a single stalk six inches high, having two oblong leaves at bottom, and rarely any above; the flowers are small, of a yellowish green colour, growing in a loose spike on the top of the stalk; they have a musky scent. This flowers in *August*.

The fifth sort grows naturally in moist pastures in the northern parts of *England*; I have also found it in great plenty on *Enfield Chace*, not far from the town. This hath many oblong bulbs joined together at the top, from which arise three or four oblong leaves; and between these comes out a slender stalk about six inches high, having a few narrow leaves, which embrace it like a sheath. The flowers grow in a close spike at the top; they are white, and have an agreeable scent. This flowers in *August and September*.

The sixth sort grows upon the chalk-hills near *Northfleet* in *Kent*, and also upon *Causbam* hills near *Reading*. This hath a roundish bulbous root, from which come out a few oblong leaves; the stalks rise a foot and a half high, garnished with a few narrower leaves; the flowers grow in a loose spike on the top of the stalk, they are of a rusty iron colour, sometimes inclinable to green. The lip of the nectarium is divided into three parts, the middle segment being stretched out much longer than the other, and is divided into two; the upper part of the flower being hooded, the whole bears some resemblance to a naked man. This flowers in *June*.

The seventh sort is commonly called the Fly Orchis. This grows naturally in *England*, but not in great plenty. Mr. *Ray* found it growing on the banks of the *Devil's ditch* in *Cambridgeshire*. I gathered it near *Northfleet* in *Kent*. It hath a roundish bulbous root, from which arise four or five oblong leaves, and a stalk about a foot high, having a few narrow acute-pointed leaves, embracing it like sheaths. The flowers are ranged on the upper part of the stalk at a distance from each other; they have no spur, the crest and wings are of an herbaceous colour, but the nectarium is very like the body of a fly. It flowers the end of *May*.

The eighth sort grows naturally in dry pastures in several parts of *England*, and is commonly called the Humble Bee Orchis; of this there are two or three varieties found wild in *England*, and several more in *Spain* and *Portugal*. This hath a roundish bulbous root, the leaves are like those of the narrow-leaved Plantain. The stalk rises six or seven inches high, having two or three sheath-shaped leaves embracing it, which are erect; at the top of the stalk come out two or three flowers without spurs, having purplish crests and wings. The nectarium is large, shaped like the body of a humble bee, of a dark sooty colour, with two or three lines running cross it, of a darker or lighter colour, which appear brighter or duller according to the position of the flower to the sun. It flowers early in *June*.

The ninth sort grows naturally on the chalk-hills near *Northfleet* in *Kent*, and in several other places. This is called the green-winged Humble Bee Orchis. The roots of this are roundish, like those of the former sort; the leaves are narrower and fewer; the stalks are shorter, the flowers a little smaller; the wings are green, and the nectarium of a dark sooty colour, and hairy. This flowers the end of *April*.

All these sorts may be preserved in gardens, though not propagated there. The best time to remove the roots from the places where they naturally grow, is just before the stalks fall, for at that time the roots may be easily discovered, and then they are beginning to rest, so that the bulb will be fully formed for flowering the following year, and will not shrink; but when they are removed at a time of the year when they are in action, the bulb designed for flowering the following year, not being fully ripened, will shrink, and frequently perish; or if they survive their removal do not recover their former strength in less time than two years.

When these are removed into a garden, the soil should be adapted to the sorts. Such of them as grow naturally in moist pastures, should be planted in shady moist borders; those which are inhabitants of woods may be planted under trees in wildernesses, but such as grow upon chalk-hills should have a bed of chalk prepared for them in an open situation; and when the plants are fixed in their several places, they should not be disturbed after, for if they are kept clean from weeds, the less the ground is disturbed, the better the plants will thrive, and the longer they will continue.

OPUNTIA. *Tourn. Inst. R. H.* 239. *tab.* 122. The Indian Fig, or prickly Pear.

The Characters are,

The flower is composed of several petals, which are obtuse, concave, and placed in a circular order, sitting upon the germen. It has a great number of awl-shaped stamina, which are inserted in the germen. The germen, which is situated under the flower, supports a cylindrical style the length of the stamina, crowned by a multifid stigma. The germen after-ward turns to a fleshy umbilicated fruit with one cell, inclosing many roundish seeds.

The Species are,

1. OPUNTIA *articulis ovatis compressis, spinis setaceis.* Indian Fig with oval compressed joints, and bristly spines; the common Indian Fig.

2. OPUNTIA *articulis ovato-oblongis, spinis setaceis.* Indian Fig with oblong oval joints, and bristly spines.

3. OPUNTIA *articulis ovato-oblongis, spinis subulatis.* Indian Fig with oblong oval joints, and awl-shaped spines.

4. OPUNTIA *articulis ovato-oblongis, spinis longissimis nigricantibus.* Indian Fig with oblong oval joints, and very long black spines.

5. OPUNTIA *articulis ovato-oblongis crassissimis, spinis inaequalibus.* Indian Fig with oblong, oval, thick joints, and unequal spines.

6. OPUNTIA *articulis ovato-oblongis subinermibus.* Indian Fig with oblong oval joints, almost without spines; commonly called the Cochineal Fig.

7. OPUNTIA *articulis cylindrico-ventricosus compressis, spinis setaceis.* Indian Fig with compressed, cylindrical, bellied joints, and bristly spines; Pinpillow.

8. OPUNTIA *articulis longissimis tenuibus compressis, spinis longissimis confertissimis, gracilibus albicantibus armatis.* *Houft. Mff.* Stalky Indian Fig with large, narrow, compressed leaves, armed with the longest, narrowest, white spines, growing in clusters; this is by the gardeners called *Robinson Crusoe's Coat*.

9. OPUNTIA *prolifer ensiformi-compressus serrato-repandus.* Indian Fig with compressed sword-shaped joints, whose indentures turn backward; Torch Thistle with a branching Spleenwort leaf.

These plants are all of them natives of *America*, though the first sort is found growing wild on the sides of the roads about *Naples*, in *Sicily*, and *Spain*, but it is probable that the plants may have been brought from *America* thither, at first. This has been long in the *English* gardens; the joints or branches are oval or roundish, compressed on their two sides flat, and have small leaves coming out in knots on their surface, as also on their upper edges, which fall off in a short time; and at the same knots there are three or four short bristly spines, which do not appear, unless they are close viewed; but on being handled they enter the flesh, and separate from the plant, so are troublesome, and often very difficult to get out. The branches of this sort spread near the ground, and frequently trail upon it, putting out new roots, so are extended to a considerable distance, and never rise in height; these are fleshy and herbaceous while they are young, but as they grow old become drier, of a tough contexture, and have ligneous fibres. The flowers come out on the upper edges of the branches, generally, though sometimes they are produced on their sides; these sit upon the embryo of the fruit, and are composed of several roundish concave petals, which spread open; they are of a pale yellow colour, and within arise a great number of stamina, fastened to the embryo of the fruit, which are terminated by oblong summits; and in the center is situated the style, crowned by a many-pointed stigma; after the flowers are past, the embryo swells to an oblong fruit, whose skin or cover is set with small spines in clusters, and the inside is fleshy, of a purple or red colour, in which are lodged many black seeds. This plant flowers here in *July* and

and *August*, but unless the season is very warm, the fruit will not ripen in *England*.

The second sort hath oblong, oval, compressed branches, which grow more erect than those of the first, armed with longer bristly spines, which come out in clusters from a point on each of the compressed sides, spreading open like the rays of a star. The flowers grow upon the embryo of the fruit, which come out from the upper edges of the leaves like the first, but are larger, and of a brighter yellow colour. The fruit is also larger, and of a deeper purple; the outer skin is also armed with longer spines: this is the most common sort in *Jamaica*, and upon the fruit of this the wild sort of *Cochineal* feeds, which is called *Sylvester*.

The third sort hath stronger branches than the second, which are armed with larger thorns, of an awl-shape; they are whitish, and come out in clusters like those of the other sort. The flowers are large, of a bright yellow colour, and the fruit is shaped like the second sort.

The fourth sort grows taller than either of the former; the branches are larger, thicker, and of a deeper green; they are armed with strong black spines, which come out in clusters like those of the other sorts, but the clusters are farther asunder. The flowers are produced from the upper edges of the branches; they are smaller than those of the other sorts, and are of a purplish colour, as are also the stamina; the fruit is of the same form as those of the first, but do not ripen here.

The fifth sort is the largest of all yet known. The joints of these are more than a foot long, and eight inches broad; they are very thick, of a deep green colour, and armed with a few short bristly spines; the older branches of this often become almost taper, and are very strong. The flowers of this sort I have never yet seen; for although I have had many of the plants more than ten feet high, none of them has produced any flowers.

The sixth sort has been always supposed to be the plant, upon which the *Cochineal* insects feed; this hath oblong, smooth, green branches, which grow erect, and rise to the height of eight or ten feet, having scarce any spines on them, and those few which are can scarce be discerned at a distance, and are so soft as not to be troublesome when handled. The flowers of this sort are small, and of a purple colour, standing upon the embryo of the fruit, in the same manner as those of the other sort, but do not expand open like them. The flowers of this appear late in the autumn, and the fruit drops off in winter, without coming to any perfection here; this is cultivated in the fields of *New Spain*, for the increase of the insects, but it grows naturally in *Jamaica*, where it is probable the true *Cochineal* might be discovered, if persons of skill were to search after the insects.

The seventh sort is said to grow naturally at *Curacoa*. This hath cylindrical swelling joints, which are closely armed with slender white spines. The branches spread out on every side, and where they have no support fall to the ground, very often separating at the joints from the plants, and, as they lie upon the ground, put out roots, so form new plants; this sort very rarely produces flowers in *England*. In the *West-Indies* it is called *Pinpillow*, from the appearance which the branches have to a pin-cushion stuck full of pins.

The eighth sort was sent me from *Jamaica*, by the late Dr. *Houssoun*, who found it growing naturally there in great plenty, but could never observe either fruit or flower upon any of the plants, nor have any of them produced either in *England*. The branches of this sort have much longer joints than any of the other; they are narrower, and more compressed. The spines of this are very long, slender, and of a yellowish brown colour, coming out in clusters all over

the surface of the branches, crossing each other, so as to render it dangerous to handle; for upon being touched the spines adhere to the hand, and quit the branches, and penetrate into the flesh, so become very troublesome.

The ninth sort grows naturally in the *Brazils*. This hath very thin branches, which are indented regularly on their edges like *Spleenwort*; they are of a light green, and shaped like a broad sword; these are smooth, having no spines. The flowers come out from the side, and at the end of the branches, sitting on the embryos in the same way as the other sorts; they are of a pale yellow colour. The fruit is shaped like those of the first sort, but rarely ripens in *England*.

All these sorts (except the first) are too tender to thrive in the open air in *England*, nor can many of them be preserved through the winter here, unless they have artificial heat; for when they are placed in a green-house, they turn to a pale yellow colour, their branches shrink, and frequently rot on the first approach of warm weather in the spring.

These plants may all be propagated by cutting off their branches at the joints, during any of the summer months, which should be laid in a warm dry place for a fortnight, that the wounded part may be healed over, otherwise they will rot with the moisture which they imbibe at that part, as is the case with most other succulent plants. The soil in which these plants must be planted, should be composed after the following manner, *viz.* one third of light fresh earth from a pasture, a third part sea sand, and the other part should be one half rotten tan, and the other half lime rubbish; these should be well mixed, and laid in a heap three or four months before it is used, observing to turn it over at least once a month, that the several parts may be well united; then you should pass it through a rough screen, in order to separate the largest stones and clods, but by no means sift it too fine, which is a very common fault; then you should reserve some of the smaller stones and rubbish to lay at the bottom of the pots, in order to keep an open passage for the moisture to drain off, which is what must be observed for all succulent plants, for if the moisture be detained in the pots, it will rot their roots, and destroy the plants.

When you plant any of the branches of these plants (except the first sort) you should plunge the pots into a moderate hot-bed, which will greatly facilitate their taking root; you should also refresh them now and then with a little water, but be very careful not to let them have too much, or be too often watered, especially before they are rooted. When the plants begin to shoot, you must give them a large share of air, by raising the glasses, otherwise their shoots will draw up so weak, as not to be able to support themselves; and after they have taken strong root, you should inure them to the air by degrees, and then remove them into the stove where they should remain, placing them near the glasses, which should always be opened in warm weather, so that they may have the advantage of a free air, and yet be protected from wet and cold.

During the summer season these plants will require to be often refreshed with water, but it must not be given to them in large quantities, lest it rot them; and in winter this should be proportioned to the warmth of the stove, for if the air be kept very warm, they will require to be often refreshed, otherwise their branches will shrink; but if the house be kept in a moderate degree of warmth, they should have but little, for moisture at that season will rot them very soon.

The heat in which these plants thrive best, is the temperate point, as marked on botanical thermometers, for if they are kept too warm in winter, it causes their shoots to be very tender, weak, and unsightly. Those sorts which

are inclinable to grow upright, should have their branches supported with stakes, otherwise their weight is so great, as to break them down.

ORANGE. See *Aurantium*.

ORCHARD. In planting of an orchard, great care should be had to the nature of the soil, and such sorts of fruits only should be chosen, as are best adapted to the ground designed for planting, otherwise there can be little hopes of their succeeding; and it is for want of rightly observing this method, that we see in many countries orchards planted, which never arrive to any tolerable degree of perfection, the trees starving, and their bodies are either covered with moss, or the bark cracks and divides, both which are evident signs of the weakness of the trees; whereas, if instead of Apples the orchard had been planted with Pears, Cherries, or any other sort of fruit better adapted to the soil, the trees might have grown very well, and produced great quantities of fruit.

As to the position of the orchard, (if you are at full liberty to choose) a rising ground, open to the south-east, is to be preferred; but I would by no means advise planting upon the side of a hill, where the declivity is very great, for in such places the great rains commonly wash down the better part of the ground, whereby the trees would be deprived of proper nourishment; but where the rise is gentle, it is of great advantage to the trees, by admitting the sun and air between them, better than it can upon an entire level; which is an exceeding benefit to the fruit, by dissipating fogs and drying up the damps, which, when detained amongst the trees, mix with the air, and render it rancid; if it be defended from the west, north, and east winds, it will also render the situation still more advantageous, for it is chiefly from those quarters that fruit trees receive the greatest injury; therefore, if the place be not naturally defended from these by rising hills (which is always to be preferred), then you should plant large growing timber trees at some distance from the orchard, to answer this purpose.

You should also have a great regard to the distance of planting the trees, which is what few people have rightly considered, for if you plant them too close, they will be liable to blights; the air being hereby pent in amongst them, will also cause the fruit to be ill tasted, having a great quantity of damp vapours from the perspiration of the trees, and the exhalations from the earth mixed with it, which will be imbibed by the fruit, and render their juices crude and unwholesome.

Wherefore I cannot but recommend the method which has been lately practised by some particular gentlemen with very good success, that is, to plant the trees fourscore feet asunder, but not in regular rows. The ground between the trees they plough and sow with Wheat and other crops, in the same manner as if it were clear from trees; and they observe their crops to be full as good as those quite exposed, except just under each tree, when they are grown large, and afford a great shade; and by thus ploughing and tilling the ground, the trees are rendered more vigorous and healthy, scarcely ever having any moss, or other marks of poverty, and will abide much longer and produce better fruit.

If the ground, in which you intend to plant an orchard, has been pasture for some years, then you should plough in the green sward the spring before you plant the trees; and if you will permit it to lie a summer fallow, it will greatly mend it, provided you stir it two or three times, to rot the sward of Grass, and prevent weeds growing thereon:

At *Michaelmas* you should plough it pretty deep, in order to make it loose for the roots of the trees, which should be planted thereon in *October*, provided the soil be dry; but if it be moist, the beginning of *March* will be a better season. The distance, if designed for a close orchard, must not be

less than forty feet, but the trees planted twice that distance will succeed better.

When you have finished planting the trees, you should provide some stakes to support them, otherwise the wind will blow them out of the ground, which will do them much injury, especially after they have been planted some time, for the ground in the autumn being warm, and for the most part moist, the trees will very soon push out a great number of young fibres, which, if broken off by their being displaced, will greatly retard the growth of the trees.

In the spring following, if the season should prove dry, you should cut a quantity of green sward, which must be laid upon the surface of the ground about their roots, turning the Grass downward, which will prevent the sun and wind from drying the ground, whereby a great expence of watering will be saved; and after the first year they will be out of danger, provided they have taken well.

Whenever you plough the ground betwixt these trees, you must be careful not to go too deep amongst their roots, lest you should cut them off, which would greatly damage the trees; but if you do it cautiously, the stirring the surface of the ground will be of great benefit to them, though you should observe never to sow too near the trees, nor suffer any great rooting weeds to grow about them, which would exhaust the goodness of the soil, and starve them.

If after the turf, which was laid round the trees, be rotted, you dig it in gently about the roots, it will greatly encourage them.

There are some persons who plant many sorts of fruit together in the same orchard, mixing the trees alternately; but this is a method which should always be avoided, for hereby there will be a great difference in the growth of the trees, which will not only render them unsightly, but also the fruit upon the lower trees ill tasted, by the tall ones overshadowing them; so that if you are determined to plant several sorts of fruit on the same spot, you should observe to place the largest growing trees backward, and so proceed to those of less growth, continuing the same method quite through the whole plantation; whereby it will appear at a distance in a regular slope, and the sun and air will more equally pass throughout the whole orchard, that every tree may have an equal benefit therefrom; but this can only be practised upon good ground, in which most sorts of fruit trees will thrive.

The soil of your orchard should also be mended once in two or three years with dung, or other manure, which will also be absolutely necessary for the crops sown between; so that where persons are not inclinable to help their orchards, where the expence of manure is pretty great, yet, as there is a crop expected from the ground besides the fruit, they will the more readily be at the charge upon that account.

In making choice of trees for an orchard, you should always observe to procure them from a soil nearly akin to that where they are to be planted, or rather poorer; for if you have them from a very rich soil, and that wherein you plant them is but indifferent, they will not thrive well, especially for four or five years after planting; so that it is a very wrong practice to make the nursery, where young trees are raised, very rich, when the trees are designed for a middling or poor soil. The trees should also be young and thriving, for whatever some persons may advise to the contrary, yet it has always been observed, that though large trees may grow and produce fruit after being removed, they never make so good trees, nor are so long lived, as those which are planted while young.

These trees, after they are planted out, will require no other pruning, but only to cut out dead branches, or such as cross each other, which render their heads confused and unsightly: the pruning them too often, or shortening their branches,

branches, is very injurious, especially to Cherries and stone fruit, which will gum prodigiously, and decay in such places where they are cut; and the Apples and Pears, which are not of so nice a nature, will produce a greater quantity of lateral branches, which will fill the heads of the trees with weak shoots, whenever their branches are thus shortened; and many times the fruit is hereby cut off, which, on many sorts of fruit trees, is first produced at the extremity of their shoots.

It may, perhaps, seem strange to some persons, that I should recommend the allowing so much distance to the trees in an orchard, because a small piece of ground will admit of very few trees when planted in this method; but they will please to observe, that when the trees are grown up, they will produce a great deal more fruit, than twice the number when planted close, and will be vastly better tasted; the trees when placed at a large distance, being never so much in danger of blighting as in close plantations, as hath been observed in *Herefordshire*, the great county for orchards, where they find, that when orchards are so planted or situated, that the air is pent up amongst the trees, the vapours which arise from the damp of the ground, and the perspiration of the trees, collect the heat of the sun, and reflect it in streams so as to cause what they call a fire blast, which is the most hurtful to their fruits; and this is most frequent where the orchards are open to the south sun.

But as orchards should never be planted, unless where large quantities of fruit are desired, so it will be the same thing to allow twice or three times the quantity of ground, since there may be a crop of grain of any sort upon the same place (as was before said), so that there is no loss of ground; and for a family only, it is hardly worth while to plant an orchard, since a kitchen-garden well planted with espaliers will afford more fruit than can be eaten while good, especially if the kitchen-garden be proportioned to the largeness of the family; and if cyder be required, there may be a large avenue of Apple trees extended cross a neighbouring field, which will render it pleasant, and produce a great quantity of fruit, or there may be some single rows of trees planted to surround fields, &c. which will fully answer the same purpose, and be less liable to the fire blasts before-mentioned.

ORCHIS. *Tourn. Inst. R. H.* 431. *tab.* 248 & 249. *Satyrium*, or Fool-stones.

The Characters are,

It hath a single stalk with a vague sheath. The flower hath five petals, three without and two within. The nectarium is of one leaf, fixed to the side of the receptacle, between the division of the petals. The upper lip is short and erect, the under large, broad, and spreading; the tube is pendulous, horn-shaped, and prominent behind. It hath two short slender stamina sitting upon the pointal, with oval erect summits, fixed to the upper lip of the nectarium. It hath an oblong contorted germen under the flower, with a short style fastened to the upper lip of the nectarium. The germen afterward turns to an oblong capsule with one cell, having three keel-shaped valves, opening on the three sides, but joined at top and bottom, filled with small seeds like dust.

The Species are,

1. ORCHIS *bulbis indivisis, nectarii labio quadrifido crenulato, cornu obtuso. Aët. Upsal.* 1740. Orchis with undivided bulbs, the lip of the nectarium cut into four points, which are slightly indented, and an obtuse horn; or common female Orchis.

2. ORCHIS *bulbis indivisis, nectarii labio æquali, cornu integro, galeæ alis reflexis acutis.* Orchis with undivided bulbs, the lip of the nectarium equal, an entire horn, and the wings of the standard acute and reflexed; the male Orchis.

3. ORCHIS *bulbis indivisis, nectarii labio lanceolato integerrimo, cornu longissimo, petalis patentibus. Aët. Upsal.* 1740.

Orchis with undivided bulbs, the lip of the nectarium entire and spear-shaped, a very long horn, and petals spreading very wide; or Butterfly Orchis.

4. ORCHIS *bulbis indivisis, nectarii labio quinquesido punctis scabro, cornu obtuso, petalis consuentibus. Aët. Upsal.* 1740. Orchis with undivided bulbs, a five-pointed lip to the nectarium, having rough spots, an obtuse horn, and petals running together; or the Man Orchis.

5. ORCHIS *bulbis indivisis, nectarii labio trifido antice bidentato, cornu longo, petalis acuminatis. Aët. Upsal.* 1740. Orchis with undivided bulbs, a trifid lip to the nectarium, indented with two teeth behind, a long horn, and acute-pointed petals; Mountain military Orchis, with a reddish conglomerated spike.

6. ORCHIS *bulbis indivisis, nectarii labio quadrifido punctis scabro, cornu obtuso, petalis distinctis. Aët. Upsal.* 1740. Orchis with undivided bulbs, the lip of the nectarium quadrifid, having rough spots, an obtuse horn, and distinct petals.

7. ORCHIS *bulbis subpalmatis rectis, nectarii cornu conico, labio trilobo, lateribus reflexo, bracteis flore longioribus. Aët. Upsal.* 1740. Orchis with straight, palmated, bulbous roots, a conical horn to the nectarium, the lip cut into three lobes, which are reflexed on the sides, and bractæ longer than the flowers.

8. ORCHIS *bulbis palmatis patentibus, nectarii cornu germinibus brevior, labio plano petalis dorsalis erectis. Aët. Upsal.* 1740. Orchis with handed spreading bulbs, the horn of the nectarium shorter than the germen, a plain lip, and the hinder part of the petals erect.

9. ORCHIS *bulbis palmatis, nectarii cornu setaceo germinibus longiore, labio crenato. Aët. Upsal.* 1740. Orchis with palmated bulbs, a bristly horn to the nectarium, which is longer than the germen, and a crenated lip.

10. ORCHIS *bulbis fasciculatis filiformibus, nectarii labio ovato integerrimo. Aët. Upsal.* 1740. Orchis with thread-like bulbs growing in bunches, and the lip of the nectarium oval and entire; or Purple Bird's Nest.

The first sort grows naturally in pastures, in most parts of *England*. This hath a double bulbous root, with some fibres coming out from the top; it has four or six oblong leaves lying on the ground, which are reflexed. The stalk rises nine or ten inches high, having four or six leaves which embrace it: this is terminated by a short loose spike of flowers, having a four-pointed indented lip to the nectarium, and an obtuse horn. The flowers are of a pale purple colour, marked with deeper purple spots. It flowers in *May*.

The second sort grows naturally in woods and shady places in many parts of *England*. This hath a double bulbous root, which is about the size and shape of middling Olives; it hath six or seven long broad leaves, shaped like those of Lillies, which have several black spots on their upper side; the stalk is round, and a foot high, having one or two smaller leaves embracing it. The flowers are disposed in a long spike on the top of the stalk; they are of a purple colour, marked with deep purple spots, and have an agreeable scent. It flowers the latter end of *April*.

The third sort grows naturally under bushes by the side of pastures in many parts of *England*. This hath a root composed of two oblong Pear-shaped bulbs, from which come out three or four Lilly-shaped leaves, of a pale green, with a few faint spots; the stalk rises near a foot high; it is slender, furrowed, and has a few very small leaves which embrace it: this is terminated by a loose spike of white flowers smelling sweet, which resemble a butterfly with expanded wings. This flowers in *June*.

The fourth sort is found growing naturally on *Carvsham* hills, and in other places where the soil is chalk. The roots of this sort are composed of two bulbs, from which come

out four or five oblong leaves; the stalk is about nine inches high, sustaining a loose spike of sweet smelling flowers, each hanging on a pretty long foot-stalk; they have a short obtuse horn, a crest and wings of an Ash colour without, reddish within, and striped with deeper lines; the lip is oblong, divided into five parts, having rough spots. This flowers in *June*.

The fifth sort grows naturally on chalk-hills in several parts of *England*. The root of this is composed of two oblong bulbs, from which arise three or four narrow oblong leaves; the stalk rises a foot high, having three or four narrow erect leaves, which embrace it. The flowers are produced in a thick roundish spike at the top; they are of a reddish colour, having long spurs, and the wings are acute-pointed. It flowers in *June*.

The sixth sort grows naturally on dry pastures in many parts of *England*. This hath a double bulbous root; the leaves are oblong and narrow; the stalk rises six or seven inches high, having two or three leaves, which embrace it like sheaths. The flowers grow in close short spikes at the top; they are of a purple colour; the lip of the nectarium is divided into four parts, having rough spots; the spur is obtuse, and the petals are distinct. There is a variety of this with a white nectarium. It flowers in *June*.

The seventh sort grows naturally in moist meadows in many parts of *England*. The root of this is composed of two fleshy bulbs, which are divided into four or five fingers, so as to resemble an open hand; the stalk rises from nine inches to a foot high, garnished with leaves the whole length, which are three or four inches long and one broad, embracing the stalk with their base; these are not spotted, and end in acute points. The flowers are disposed in a spike on the top of the stalk, with small narrow leaves (called bractæ) between them, which are longer than the flowers. The spur is half an inch long, extended backward; the lip of the nectarium is broad, divided into three lobes, two side ones being reflexed; the flowers and bractæ are of a purplish colour, having deep purple spots. It flowers in *May*. There are two varieties of this, differing in the colour of their flowers, and one with a narrow leaf.

The eighth sort grows naturally in meadows in several parts of *England*. The root of this is composed of two broad fleshy bulbs, both of which are divided into four fingers, which spread asunder. The stalk rises a foot and a half high, and is very strong, inclining to a purple colour; it is garnished with leaves the whole length. The flowers are collected in a close spike at the top of the stalk; they are of a pale purple colour; the spur is about a third part of an inch long; the beard of the nectarium is plain, and divided into three parts, which is marked with deep purple spots; under each foot-stalk is placed a narrow leaf (or bractæ) of a purplish colour. The leaves and stalks of the plant have many dark spots. It flowers in *June*. There are two or three varieties of this, which differ in the colour of their flowers.

The ninth sort grows naturally in moist meadows in several parts of *England*. This hath a double handed root, that which sustains the stalk being wasting and decaying, but the other is full, succulent, and plump; the fingers which compose the root are long, and spread asunder; the lower leaves are six or seven inches long; they are narrow, of a pale green, and have no spots. The stalk rises a foot high; it is garnished with a few narrow short leaves, which embrace it like sheaths. It is terminated by a beautiful spike of red flowers six inches long; the flowers are not marked with any spots; they have long slender bristly spurs like birds claws, being crooked; the lip of the nectarium is indented on the edge. It flowers in *June*.

The tenth sort grows naturally in shady woods in several

parts of *England*, but particularly in *Suffex* and *Hampshire*, in both which counties I have several times found it. The root of this plant is composed of many thick, oblique, long fibres, which are fleshy; the stalk rises near two feet high, wrapped round with leaves like sheaths; these are of a purple colour. The flowers are disposed in a loose thyrse at the top of the stalk; they are of a purple colour, having an oval entire lip to the nectarium, the crest terminating in a horn. It flowers in *June*.

All these sorts of *Orchis* grow wild in several parts of *England*, but, for the extreme oddness and beauty of their flowers, deserve a place in every good garden; and the reason for their not being cultivated in gardens, proceeds from their difficulty to be transplanted; though this, I believe, may be easily overcome, where a person has an opportunity of marking their roots in their time of flowering, and letting them remain until their leaves are decayed, when they may be transplanted with safety; for it is the same with most sorts of bulbous or fleshy rooted plants, which, if transplanted before their leaves decay, seldom live, notwithstanding you preserve a large ball of earth about them; for the extreme parts of their fibres extend to a great depth in the ground, from whence they receive their nourishment, which, if broken or damaged by taking up their roots, seldom thrive after; for though they may sometimes remain alive a year or two, yet they grow weaker until they quite decay; which is also the case with *Tulips*, *Fritillarias*, and other bulbous roots, when removed, after they have made shoots; so that whoever would cultivate them, should search them out in their season of flowering, and mark them; and when their leaves are decayed, or just as they are going off, the roots should be taken up, and planted in a soil and situation as nearly resembling that wherein they naturally grow, as possible, otherwise they will not thrive, so that they cannot be placed all in the same bed; for some are only found upon chalky hills, others in moist meadows, and some in shady woods, or under trees; but if their soil and situation be adapted to their various sorts, they will thrive and continue several years, and, during their season of flowering, will afford as great varieties as any flowers which are at present cultivated.

OREOSELINUM. See *Athamanta*.

ORIGANUM. *Lin. Gen. Plant.* 645. *Origany*, or *Pot Marjoram*.

The Characters are,

The flower is of the lip kind; the upper lip is plain, erect, obtuse, and indented; the under lip is trifid, the segments being nearly equal. The flowers have four slender stamina, two being as long as the petal, the other two are longer, terminated by simple summits; they have a four-cornered germen, supporting a slender style inclining to the upper lip, crowned by a bifid stigma. The germen afterward turns to four seeds shut up in the empalement of the flower.

The Species are,

1. ORIGANUM *spicis subrotundis paniculatis conglomeratis, bracteis calyce longioribus ovatis. Lin. Sp. Plant.* 590. *Pot Marjoram* with roundish paniculated spikes gathered in clusters, and oval bractæ which are longer than the empalement; or common wild *Origany*.

2. ORIGANUM *spicis longis pedunculis aggregatis, bracteis longitudine calycum. Lin. Ger. Plant.* 589. *Origany* with long spikes growing in bunches, and bractæ as long as the empalement; or winter sweet *Marjoram*.

3. ORIGANUM *spicis oblongis paniculatis conglomeratis, foliis ovatis glabris. Origany* with oblong spikes of flowers growing in clustered panicles, and oval smooth leaves; or broad-leaved smooth *Origany*.

4. ORIGANUM *caule repente, spicis oblongis conglomeratis, bracteis solum longioribus. Origany* with a creeping stalk, and

and oblong spikes of flowers growing in clusters, with bractæ longer than the flower; low wild Origany.

5. *ORIGANUM caule erecto ramoso, foliis ovatis rugosis, spicis subrotundis conglomeratis, bracteis calycum brevioribus.* Origany with an erect branching stalk, oval rough leaves, roundish spikes of flowers growing in clusters, with bractæ shorter than the empalement.

6. *ORIGANUM spicis aggregatis longis prismaticis rectis bracteis, membranaceis, calyce duplo longioribus.* *Lin. Sp. Plant.* 589. Origany with long, upright, prismatical spikes growing in clusters, and membranaceous bractæ twice the length of the empalement; Origany of *Crete*.

7. *ORIGANUM foliis ovalibus obtusis, spicis subrotundis compactis pubescentibus.* *Hort. Cliff.* 304. Origany with oval obtuse leaves, and roundish, compact, hairy spikes; common, or sweet Marjoram.

8. *ORIGANUM foliis carnosis tomentosis.* *Lin. Sp. Plant.* 588. Origany with fleshy woolly leaves.

9. *ORIGANUM foliis ovatis acutè serratis, spicis congestis umbellatim fastigiatis.* *Hort. Cliff.* 304. Origany with oval leaves acutely sawed, and spikes of flowers disposed in umbellated bunches.

10. *ORIGANUM foliis omnibus tomentosis, spicis nutantibus.* Origany with all the leaves woolly, and nodding spikes of flowers; or Dittany of *Crete*.

11. *ORIGANUM foliis omnibus glabris, spicis nutantibus.* *Hort. Cliff.* 304. Origany with all the leaves smooth, and nodding spikes of flowers; Dittany of mount *Sipylius*.

12. *ORIGANUM foliis inferioribus tomentosis, spicis nutantibus.* *Hort. Cliff.* 304. Origany with the under leaves hoary, and nodding spikes of flowers.

13. *ORIGANUM spicis oblongis aggregatis hirsutis, foliis cordatis tomentosis.* *Lin. Sp. Plant.* 590. Origany with oblong hairy spikes growing in bunches, and heart-shaped woolly leaves.

The first grows naturally in thickets, and among bushes in several parts of *England*; the root is perennial, composed of many small ligneous fibres. The stalks are square, and rise near two feet high; they are ligneous, and garnished with oval leaves placed by pairs at each joint; from the wings of these come out three or four smaller leaves on each side, which resemble those of Marjoram, sitting close to the stalk; they have an aromattick scent; the flowers are produced in roundish spikes growing in panicles at the top of the stalks, many of the spikes being gathered together; they are of a flesh colour, and peep out of their scaly covering. Their upper lip is cut into two, standing erect, and the lower lip or beard is divided into three; the stamina stand out a little beyond the petals, and are of a purplish colour. It flowers in *June* and *July*, and the seeds ripen in the autumn. This sort is sometimes cultivated in gardens, and is by some called Pot Marjoram, as it is generally used in soups.

It will rise plentifully from scattered seeds, or it may be propagated by parting of the roots; the best time for doing this is in autumn, and may be planted in any soil not overmoist, and will thrive in any situation, so require no other care, but to keep it clear from weeds. There is a variety of this with white flowers and light green stalks, and another with variegated leaves.

The second sort is now commonly known by the title of winter sweet Marjoram, though this was formerly stiled Pot Marjoram. This hath a perennial root, from which arise many branching four-cornered stalks a foot and a half high, inclining to a purplish colour, garnished with oval, obtuse, hairy leaves, resembling greatly those of sweet Marjoram, standing opposite; the flowers are disposed in spikes about two inches long, several arising together from the divisions of the stalk. They are small, white, and

peep out of their scaly covers; these appear in *July*, and the seeds ripen in autumn. It grows naturally in *Greece* and the warm parts of *Europe*, but is hardy enough to thrive in the open air in *England*, and is chiefly cultivated for nose-gays, as it comes sooner to flower than sweet Marjoram, so it is used for the same purposes, till the other comes to maturity. There is a variety of this with variegated leaves. This is generally propagated by parting of the roots in autumn, and should have a dry soil, where it will thrive, requiring no other culture than the first sort.

The third sort grows naturally in *France* and *Italy*; this hath a perennial root, from which arise several slender bending stalks near a foot high, garnished with oval smooth leaves, standing on pretty long foot-stalks. The flowers are produced in oblong spikes, which grow in clustered panicles; they are small, of a purplish colour, peeping out of their scaly covering. It flowers in *June*, and may be propagated by parting of the roots in the same way as the former.

The fourth sort grows plentifully about *Orleans*; this hath a perennial root, from which arise several four-cornered stalks about six inches high, which frequently bend to the ground, and put out roots; they are garnished with oblong hairy leaves, sitting close to the stalk. The flowers grow in oblong clustered spikes at the top of the stalks, having long coloured bractæ between each; the flowers are some whitish, others purple in the same spikes; they are small, and peep out of their scaly covers. This flowers in *June*, and may be propagated in the same way as the former.

The fifth sort grows naturally in the *Levant*; it is a perennial plant. The stalks rise near two feet high, and branch out their whole length; they are purple, garnished with oval rough leaves, somewhat like those of Self-heal, but smaller. The flowers grow in roundish clustered spikes, having short bractæ; they are purple, and appear in *June*, but are not succeeded by seeds here. It is propagated by parting of the heads in the same way as the former, and must have a dry soil.

The sixth sort is the Origany of *Crete*, which is directed to be used in medicine, but there has been great confusion among botanists in distinguishing the species. This rises with four-cornered stalks a foot high, garnished with thick, hoary, oval leaves, of a strong aromattick scent. The flowers grow in long, erect, bunched spikes at the top of the stalks, having membranous bractæ between, which are twice the length of the empalement; the flowers are small and white like those of the common Origany. It flowers in *July*, but seldom perfects seeds in *England*. It is propagated by parting of the roots as the former, but must have a dry soil and a warm situation, otherwise it will not live through the winter here.

The seventh sort is the common sweet Marjoram, which is so well known as to need no description. With us in *England* it is esteemed an annual plant, though the roots often live through the winter in mild seasons, or if they are sheltered in a green-house; but in warm countries, I believe, it is only biennial.

This is propagated by seeds, which are generally imported from the south of *France* or *Italy*, for they seldom ripen in *England*. These are sown on a warm border toward the end of *March*, and when the plants are come up about an inch high, they should be transplanted into beds of rich earth, at six inches distance every way, observing to water them duly till they have taken new root, after which they will require no other care, but to keep them clean from weeds. The plants will spread and cover the ground, in *July* they will begin to flower, at which time it is cut for use, and is then called knotted Marjoram, from the heads

of flowers being collected into roundish close heads like knots.

The eighth sort grows naturally in *Africa*; this is a perennial plant with a low shrubby stalk, seldom rising more than a foot and a half high, dividing into branches, which are garnished with roundish, thick, woolly leaves, hollowed like a ladle; they are like those of the common Marjoram, but are of a thicker substance and woolly, and have much the same scent. The flowers are produced in roundish spikes closely joined together at the top of the stalks, and, at the end of the small side branches, they are of a pale flesh colour, peeping out of their scaly coverings. This sort flowers in *July* and *August*, but does not ripen seeds in *England*.

It is propagated by slips or cuttings, which if planted in a border of good earth during any of the summer months, and shaded from the sun and duly watered, will take root freely, and afterward the plants may be taken up, and planted in small pots filled with light kitchen-garden earth, and placed in the shade till they have taken new root; then they may be removed into an open situation, where they may remain till the end of *October*, when they must be placed under shelter, for they will not live through the winter in the open air here; but if they are put under a hot-bed frame, where they may be protected from hard frost, and have as much free air as possible in mild weather, they will thrive better than if they are more tenderly treated.

The tenth sort is the Dittany of *Crete*, which is used in medicine; this grows naturally upon mount *Ida*, in *Candia*; it is a perennial plant. The stalks are hairy, and rise about nine inches high, of a purplish colour, and send out small branches from their sides by pairs opposite; they are garnished with round, thick, woolly leaves, which are very white; the whole plant has a piercing aromatick scent, and biting taste; the flowers are collected in loose leafy heads of a purple colour, which nod downward. They are small, and of a purple colour; the stamina stands out beyond the petal, two of them being much longer than the other. It flowers in *June* and *July*, and in warm seasons the seeds ripen in autumn.

This is propagated easily by planting cuttings or slips, during any of the summer months. These should be planted either in pots or a shady border, covering them close with a bell or hand-glass to exclude the air, and now and then refreshing them with water, but they must not have too much wet. When these have taken root, they should be carefully taken up, and each planted into a separate small pot, filled with light earth, and placed in the shade till they have taken new root, when they should be removed into an open situation, where they may continue till autumn, and then placed under a hot-bed frame, to screen them from the frost, but they should enjoy the free air at all times in mild weather. The following spring some of the plants may be shaken out of the pots, and planted in a warm border near a good aspect wall, and in a dry soil, where the plants will live through the common winters without any other shelter; but as they are liable to be killed by severe frost, so it will be proper to keep a few plants in pots, to be sheltered in winter to preserve the kind.

The eleventh sort grows naturally on mount *Sipylos* near *Magnesia*, where it was discovered by Sir *George Wheeler*, who sent the seeds to the *Oxford* garden, where the plants were raised: this hath a perennial root, but an annual stalk. The root is composed of many slender ligneous fibres; the leaves are oval, smooth, and of a grayish colour; the stalks are slender, of a purplish colour, four-cornered and smooth; they rise near two feet high, sending out slender branches on each side opposite, which are terminated by slender oblong

spikes of purplish flowers, which peep out of their scaly covers; the flowers are small, but shaped like those of the tenth sort; their stamina are extended out of the petal a considerable length. The leaves on the lower part of the stalk, are almost as large as the common *Origany*, but those on the upper part of the stalk and branches are very small, and sit close to the stalk. It flowers in *June* and *July*, and in warm seasons the seeds ripen here in autumn. It is propagated by cuttings or slips, in the same way as the *Cretan Dittany*, and the plants require the same treatment.

The twelfth sort is undoubtedly a variety, which has been produced from the intermixing of the farina of the *Cretan Dittany* with that of mount *Sipylos*; for the plants now in the *Chelsea* garden, were accidentally produced from the seeds of one species, where both sorts stood near each other, in the garden of *John Browning*, Esq; of *Lincoln's-Inn*; the seeds were dropped from the plant into the border between the two sorts, so that it is uncertain from which species; but as the stalks and heads of flowers bear a greater resemblance to the Dittany of mount *Sipylos*, we may suppose it arose from the seeds of that, which had been impregnated by the farina of the *Cretan Dittany*, which grew near it; for the under leaves of this are round, of a thick texture and woolly, so nearly resembling those of the *Cretan Dittany*, as not to be distinguished from it; but the stalks rise full as high as those of the Dittany of mount *Sipylos*, but branch out more their whole length, they are of a purple colour and hairy. The lower leaves on the stalks are much larger than those of mount *Sipylos*, and are a little hairy, approaching to those of the *Cretan Dittany*, but are not so thick or woolly; the upper leaves are smooth, and approach to those of the other sort, but are larger, as are also the spikes of flowers, and the scaly leaves which cover the flowers are larger and of a deeper purple colour.

I have also dried samples of another variety, which arose from seeds in the *Leyden* garden; the seeds were sent from *Paris*, by the title which *Tournefort* gave to that which he found in the *Levant*, which I have joined to the variety before-mentioned. The leaves of this are as large as those of the Dittany of *Crete*, but are not so thick or woolly; the stalks rise more like those of the Dittany of mount *Sipylos*, but branch out wider at the top; the flowers grow in closer clusters, and do not nod downward; they are small, and shaped like those of the former sort, flowering at the same time.

By the title which *Dr. Linnæus* has given to the *Cretan Dittany*, it may be supposed he has not seen the true sort, for his title better suits the variety to which I have applied it; for all the leaves of the true Dittany are very thick and woolly, even those which are situated immediately below the flowers, whereas the lower leaves only are so in his title.

The thirteenth sort grows at *Syracuse*; this hath perennial ligneous stalks, which rise a foot and a half high, dividing into many small branches, which are garnished with small heart-shaped leaves, a little larger than those of *Marjoram*, which are woolly. The flowers grow in oblong tufted spikes which are hairy, they are small, white, and peep out of their scaly covers; they appear in *July*, but seldom perfect seeds in *England*. This is propagated by cuttings or slips, in the same way as the tenth sort, and the plants require the same treatment.

The first and sixth sorts are used in medicine, but the first being a native of this country, is frequently substituted for the other, which is pretty rare in *England*, and is now seldom imported here. When the first sort is used, those plants which grow upon dry barren ground are to be preferred, as they are much stronger and have greater virtue, than those which grow on good land, or are cultivated in gardens.

The Dittany of *Crete* is also used in medicine, but the dried herb is generally imported into *England*, which, by being closely packed, and the voyage being long, it loses much of its virtue; so that if the plants of *English* growth were used, they would be found much better.

ORNITHOGALUM. *Tourn. Inst. R. H.* 378. tab. 203. Star of *Bethlehem*.

The Characters are,

The flower has no empalement. It is composed of six petals, whose under parts are erect, but spread open above. It hath six erect stamina, about half the length of the petals, crowned by single summits, with an angular germen, supporting an awl-shaped style, terminated by an obtuse stigma. The germen afterward turns to a roundish angular capsule with three cells, filled with roundish seeds.

The Species are,

1. ORNITHOGALUM *racemo longissimo, filamentis lanceolatis, pedunculis floriferis patentibus aequalibus, fructiferis scapo approximatis. Lin. Sp. Plant.* 307. Star-flower with a very long spike of flowers, spear-shaped filaments, and foot-stalks to the flowers equal and spreading, and those of the fruit approaching to the stalk; or Star-flower, with whitish green flowers.

2. ORNITHOGALUM *racemo conico, floribus numerosis ascendentibus. Prod. Leyd.* 32. Star-flower with a conical spike, having numerous flowers rising above each other.

3. ORNITHOGALUM *racemo longissimo, foliis lanceolato-nerviiformibus. Lin. Sp. Plant.* 307. Star-flower with the longest spike, and spear-shaped leaves.

4. ORNITHOGALUM *racemo longissimo, pedunculis alternis brevioribus, petalis exterioribus angustioribus.* Star-flower with a very long spike, the foot-stalks of the flowers alternately shorter, and the outer petals narrow.

5. ORNITHOGALUM *floribus secundis pendulis, nectario lamineo campaniformi. Lin. Sp. Plant.* 308. Star-flower with fruitful hanging flowers, and a bell-shaped nectarium.

6. ORNITHOGALUM *petalis alternis patentibus, interioribus erectis. Lin. Sp. Plant.* 308. Star-flower with spreading alternate petals, and the lower ones erect.

7. ORNITHOGALUM *scapo anguloso diphylo, pedunculis umbellatis simplicibus. Flor. Suec.* 270. Star-flower with an angular stalk having two leaves, and single umbellated foot-stalks; yellow Star-flower.

8. ORNITHOGALUM *scapo angulato diphylo, pedunculis umbellatis ramosis. Flor. Suec.* 271. Star-flower with an angular stalk bearing two leaves, and branching foot-stalks having umbels.

9. ORNITHOGALUM *floribus corymbosis, pedunculis scapo altioribus, filamentis emarginatis. Hort. Cliff.* 124. Star-flower with flowers growing in a corymbus, whose foot-stalks are taller than the stalk, and indented filaments.

10. ORNITHOGALUM *floribus corymbosis, pedunculis scapo humilioribus, filamentis emarginatis. Prod. Leyd.* 32. Star-flower with flowers growing in a corymbus, foot-stalks lower than the stalk, and indented filaments.

11. ORNITHOGALUM *racemo conico laxo, pedunculis longissimis, floribus erectis. Plat.* 192. Star-flower with a loose conical spike of flowers, very long foot-stalks, and flowers standing erect.

12. ORNITHOGALUM *foliis cordatis ovatis. Prod. Leyd.* 31. Star-flower with oval heart-shaped leaves.

13. ORNITHOGALUM *racemo longissimo, foliis teretibus fistulosis.* Star-flower with a very long spike, and taper fistular leaves.

The first sort grows naturally near *Bristol*, and also near *Chichester* in *Suffex*, and some other parts of *England*. This hath a pretty large bulbous root, from which come out several long keel-shaped leaves, which spread on the ground; between these comes out a single naked stalk about two feet

long, sustaining a long loose spike of flowers of a yellowish green colour, standing upon pretty long foot-stalks, which spread wide from the principal stalk; the petals of the flowers are narrow, making but little appearance. The flowers have an agreeable scent; they appear in *May*, and when the seed-vessels are formed, the foot-stalks which sustain them become erect, and approach near the stalk. The seeds ripen in *August*.

The second sort grows naturally upon the hills in *Portugal* and *Spain*, but has been long cultivated in the *English* gardens, by the title of *Star of Bethlehem*. This hath a very large, oval, bulbous root, from which arise several long keel-shaped leaves of a dark green colour, and in the middle comes out a naked stalk which rises near three feet high, terminated by a long conical spike of white flowers, standing upon pretty long foot-stalks, which rise one above another, inclining to an upright. These appear in *June*, and are succeeded by roundish seed-vessels, having three cells filled with roundish seeds, which ripen in *August*.

The third sort grows naturally in *Arabia*; this hath a very large bulbous root, from which come out several broad keel-shaped leaves; the stalk is thick and strong, rising between two and three feet high, bearing a long spike of large white flowers, standing upon long foot stalks. They are composed of six petals, which spread open in form of a star, and appear in *June*, but do not ripen their seeds in *England*.

The fourth sort grows naturally in the *Levant*. I had this brought me from the island of *Zant*, by *Mr. Moore*, who was consul there; this hath a pretty large bulbous root, from which arise five or six long narrow leaves. The stalk rises about a foot and a half high, and is terminated by a long loose spike of white flowers, composed of six petals; the inner ones are broad, and the outer which stand alternate, are narrow. It flowers in *June*, but does not perfect seeds here.

The fifth sort grows in great abundance naturally in the kingdom of *Naples*, and is now become almost as common in *England*, for the roots propagate so fast by offsets and seeds, as to become troublesome weeds in gardens; and in many places where the roots have been thrown out of gardens, they have grown upon dunghills and in waste places as plentifully as weeds. This hath a pretty large compressed bulbous root, from which come out many long, narrow keel-shaped leaves, of a dark green colour. The stalks are very thick and succulent, rising about a foot high, sustaining ten or twelve flowers in a loose spike, each hanging on a foot-stalk an inch long; they are composed of six petals, which are white within, but of a grayish green on their outside, having no scent; within the petals is situated the bell-shaped nectarium, composed of six leaves, out of which arise the six stamina, terminated by yellow summits. The flowers appear in *April*, and are succeeded by large, roundish, three-cornered capsules, which are filled with roundish seeds; as the capsules grow large, they are so heavy as to weigh the stalk to the ground.

The sixth sort grows naturally in *Africa*, as also in the island of *Zant*, from whence I received it; this hath a bulbous root, much smaller than either of the former. The leaves are long, narrow, keel-shaped, and flaccid. The stalks rise about a foot high; they are slender, and sustain six or seven flowers hanging on long slender foot-stalks, placed at a distance from each other; they are composed of six petals, of a yellowish green colour, the three inner standing erect, and the three outer spread open wide. This flowers in *July*, but does not produce seeds here.

The seventh sort grows naturally in *Yorkshire*, and some of the other northern counties in *England*; this hath a large bulbous root, from which come out four or five keel-shaped

leaves about six inches long, and in the middle arises an angular stalk having two narrow leaves, which grow about six inches high, sustaining at the top six or eight yellow flowers in form of an umbel, standing upon slender long foot-stalks. These appear in *April*, and are succeeded by triangular capsules having three cells, which are filled with roundish seeds.

The eighth sort hath small bulbous roots not larger than Peas, from which arise one or two narrow keel-shaped leaves about five inches long, of a grayish colour; the stalk is angular, and rises about four inches high, having two narrow keel-shaped leaves just below the flowers, which are disposed in an umbel upon branching foot-stalks; these are yellow within, but of a purplish green on their outside. They appear in *May*, and are succeeded by small triangular capsules, filled with reddish uneven seeds. It grows on the borders of cultivated fields in *France* and *Germany*.

The ninth sort grows naturally in most parts of *Europe*, and is supposed to do so in *England*, though it is seldom found here, unless in orchards or grounds, where the roots may have been planted, or thrown out of gardens with rubbish. This hath a bulb as large as a small Onion, to which adhere many small offsets; the leaves are long, narrow, and keel-shaped, spreading on the ground, and have a longitudinal white line through the hollow. The stalk rises about six inches high, sustaining an umbel of flowers which are white within, but have broad green stripes on the outside of the petals; these stand upon long foot-stalks, which rise above the principal stalk. It flowers in *April* and *May*, and is succeeded by roundish three-cornered capsules, filled with angular seeds, which ripen in *July*.

The tenth sort grows naturally in *Arabia*; this hath a large bulbous root, from which arise many long keel-shaped leaves, which embrace each other with their base; they are of a deep green, and stand erect. The flowers of this kind I have never yet seen, though I have tried many ways to procure them: the roots multiply exceedingly, and are never injured by frost, although the leaves are put out before winter. These roots are frequently brought over from *Italy* for sale, but I have not heard of any having flowered; and *Clusius* says, he never saw but one root flower, and that came from *Constantinople*.

The eleventh sort grows naturally at the *Cape of Good Hope*; this hath a round bulbous root, covered with a white skin, from which come out four or five keel-shaped leaves, embracing each other at their base; they are of a deep green, eight or nine inches long; in the middle of these arises the stalk, which is naked and about a foot high; just under the flowers come out two or three short leaves, which end in acute points. The flowers stand upon very long foot-stalks, they are formed in a conical spike, and are composed of six oval petals of a pure white; within these are situated six stamina, which are about half the length of the petals, terminated by roundish summits. The flowers are in beauty in *May*, and are succeeded by roundish three-cornered capsules with three cells, filled with roundish seeds, which some years ripen here in *July*.

The twelfth sort grows naturally at the *Cape of Good Hope*; this hath an irregular tuberous root, varying greatly in form and size, covered with a dark brown bark, from which arise several oval heart-shaped leaves, upon pretty long foot-stalks; they have several longitudinal veins, like Ribwort Plantain. The flower-stalks are slender, naked, and rise about a foot high, sustaining several small, greenish, white flowers, formed in a loose spike, standing upon long slender foot-stalks. They come out in *November*, making but little appearance, and are not succeeded by seeds in *England*.

The thirteenth sort grows naturally on the dry rocks at

the *Cape of Good Hope*; this hath a large, depressed, bulbous root, as big as a man's fist, covered with an uneven brown skin, putting out several taper hollow leaves, nine or ten inches long, between which comes forth a naked stalk near a foot high, terminated by a loose spike of yellow flowers, of an agreeable sweet scent. It flowers in *May*, but does not produce seeds in *England*.

The four sorts first mentioned, are cultivated for ornament in the *English* gardens. These are propagated by offsets, which their roots commonly produce in great plenty. The best time to transplant their roots is in *July* or *August*, when their leaves are decayed; for if they are removed late in autumn, their fibres will be shot out, when they will be very apt to suffer, if disturbed. They should have a light sandy soil, but it must not be over dunged. They may be intermixed with other bulbous-rooted flowers in the borders of the pleasure-garden, where they will afford an agreeable variety, and continue in flower a long time. Their roots need not be transplanted oftener than every other year, for if they are taken up every year, they will not increase so fast; but when they are suffered to remain too long unre-moved, they will have so many offsets about them as to weaken their blowing roots. These may also be propagated from seeds, which should be sown and managed as most other bulbous rooted flowers, and will produce their flowers in three or four years after sowing.

The fifth sort is scarce worthy of a place in gardens, but as it will thrive in any situation or under trees, so a few plants may be admitted for the sake of variety.

The sixth sort has not much beauty, therefore a few roots of it will be enough for variety, as also of the seventh and eighth sorts; the two last will thrive in shade, but the sixth should have an open situation.

The ninth and tenth sorts multiply so fast by offsets from the roots, as to become troublesome weeds in a garden; for every small root will grow, and in two years produce twenty or thirty more, so that unless the large roots are taken up every year, and divested of their offsets, the borders will be over-run with them.

The eleventh sort is too tender to thrive in the open air in *England*, so the roots of this should be planted in pots filled with light earth, and in the autumn placed under a hot-bed frame, where they may be screened from frost, and in mild weather enjoy the free air. The leaves of this appear in the autumn, and continue growing all the winter, so must not be exposed to frost; nor should be drawn up weak, for then the flowers will be few on a stalk, and not large. If the pots do now and then receive a gentle shower of rain in winter, it will be sufficient, for they should not have much wet during that season. Toward the beginning of *July* the leaves and stalks decay, and then the roots may be taken up, laying them in a dry cool place till the end of *August*, when they must be planted again.

The twelfth and thirteenth sorts, were formerly more common in the *English* gardens than at present. These kinds are more tender than either of the former, so should be planted in pots filled with fresh light earth; and in winter must be placed in an airy glass-case, amongst Sedums, Ficoideſes, and such other pretty hardy succulent plants, which require a large share of air in mild weather, and but little wet. In summer they may be removed out of the house, and placed in a warm sheltered situation, observing never to give these plants much water when they are not in a growing state, lest it rot their roots; but when they are growing freely, they must be frequently but gently refreshed with water. These roots should be transplanted every year; the best time to perform this work is soon after the flower-stems are decayed, when the roots will be in the most inactive state. When this is done, the offsets should be carefully

carefully taken off, and each transplanted into a separate small pot, filled with light fresh earth, and may be treated as the old roots.

The other species, which were included in this genus, are now removed to *SCILLA*.

ORNITHOPUS. *Lin. Gen. Plant.* 790. Birds-foot.

The Characters are,

The empalement of the flower is permanent, of one leaf, tubulous, and indented in five equal segments at the brim. The flower is of the butterfly kind; the standard is heart-shaped and entire; the wings are oval, erect, and almost as large as the standard; the keel is small and compressed. It hath ten stamina, nine of which are joined, and one stands separate, terminated by single summits. The germen is narrow, supporting a bristly ascending style, terminated by a punctured stigma. The germen afterward becomes a taper incurved pod, having many joints connected together, but when ripe separate, each containing one oblong seed.

The Species are,

1. *ORNITHOPUS foliis pinnatis, leguminibus compressis subarcuatis*. Birds-foot with winged leaves, and compressed pods a little arched.

2. *ORNITHOPUS foliis pinnatis, leguminibus confertis pedunculatis*. Birds-foot with winged leaves, and pods growing in clusters upon foot-stalks.

3. *ORNITHOPUS foliis pinnatis, pinnis linearibus, leguminibus binis compressis arcuatis*. Birds-foot with linear winged leaves, and compressed arched pods growing in pairs.

4. *ORNITHOPUS foliis pinnatis, leguminibus compressis villosis recurvis*. Birds-foot with winged leaves, and compressed woolly pods, which are recurved.

5. *ORNITHOPUS foliis ternatis subsessilibus appendiculatis, impari maximo*. *Hort. Cliff.* 364. Birds-foot with trifoliate leaves sitting close to the stalk, having appendages, and the middle lobe very large.

The first sort grows naturally in the south of France, in Spain and Italy. It is an annual plant, having many trailing stalks a foot and a half long, from which come out a few side branches; these are garnished with long winged leaves, composed of about eighteen pair of small oval lobes, terminated by an odd one; these lobes stand sometimes opposite, and at others they are alternate and hairy. The flowers are produced in small clusters at the top of foot-stalks, which arise from the wings of the stalks, and are near three inches long, having a small winged leaf, part of which is below, and the other part above the flowers, so that they seem to come from the midrib of the leaf; the flowers are of a deep gold colour, shaped like a butterfly. These appear in July, and are succeeded by flat narrow pods about three inches long, which turn inward at the top like a bird's claw. These are jointed, and a little hairy, containing a single seed in each joint, which ripens in autumn, when the joints separate and fall asunder.

The second sort grows naturally on dry commons and heaths in most parts of England. The root of this sort is composed of two or three strong fibres, to which hang several small tubercles or knobs like grains. There are many slender stalks come out from the root, which spread on the ground, and are from four to eight inches long; these are garnished with small, winged, hairy leaves, composed of six or seven pair of narrow lobes, terminated by an odd one. The flowers stand upon slender foot-stalks, which come out at every joint of the stalk; they are small, of a yellow colour, and are succeeded by clusters of short pods, which are a little incurved at the top. It flowers and seeds about the same time as the former.

The third sort grows plentifully about Messina and Naples. The root of this sort runs deep into the ground, sending out a few small fibres on the side; the stalks are about six inches long, and do not lie flat on the ground like the other; the

leaves are hairy, and are composed of ten or twelve pair of narrow lobes placed along the midrib, terminated by an odd one. The flowers grow in small bunches on the top of the branches; they are yellow, and these are generally succeeded by two flat pods not much more than an inch long, turned inward like a bird's claw. This flowers and seeds about the same time with the former.

The fourth sort was sent me from the Pisa garden by Dr. Tilli, the professor of botany, who informed me he had received the seeds from Africa. This approaches near to the first sort, but the stalks are much longer and smooth; the leaves are not so long; the lobes are larger, and not more than five pair to each leaf; the pods are longer and broader, and but little arched at the point. This is annual, and flowers at the same time with the former.

The fifth sort grows naturally among the Corn in Spain and Italy. This hath many smooth branching stalks, which rise near two feet high, garnished toward their top with trifoliate oval leaves sitting close, having two small appendages. The lower leaves are often single, and of a grayish colour, the middle lobe being twice the size of the two side ones. The flowers stand upon slender foot-stalks, are yellow, and succeeded by taper pods, which are two inches long, shaped like a bird's claw. This flowers and seeds about the same time with the former.

These plants are propagated by sowing their seeds in the spring upon a bed of light fresh earth, where they are to remain (for they seldom do well when they are transplanted); and, when the plants come up, they must be carefully cleared from weeds, and where they are too close, some of the plants should be pulled out, so as to leave the remaining ones about ten inches asunder. In June these plants will flower, and the seeds will ripen in August. There is no great beauty in these plants, but, for the variety of their jointed pods, they are preserved by some curious persons in their pleasure-gardens; where, if their seeds are sown in patches in the borders, each sort distinctly by itself, and the plants thinned, leaving only two at each patch, they will require no farther care, and will add to the variety, especially where the snail and caterpillar plants are preserved, which are very proper to intermix with them. They are all annual plants, which perish soon after the seeds are ripe.

OROBUS. *Tourn. Inst. R. H.* 393. tab. 214. Bitter Vetch.

The Characters are,

The empalement of the flower is tubulous, of one leaf; the brim is oblique and indented in five parts. The flower is of the butterfly kind; the standard is heart-shaped; the two wings are almost as long as the standard, and join together; the keel is bifid, acute-pointed, rising upwards; the borders are compressed, and the body swollen. It hath ten stamina, nine are joined, and one separate. It hath a cylindrical compressed germen, supporting a crooked rising style, crowned by a narrow downy stigma. The germen afterward becomes a long taper pod, ending in an acute point, having one cell, containing several roundish seeds.

The Species are,

1. *OROBUS foliis pinnatis ovatis, stipulis semisagittatis integerrimis, caule simplici*. *Lin. Sp. Plant.* 728. Bitter Vetch with oval winged leaves, entire stipulæ, half arrow-pointed, and a single stalk.

2. *OROBUS foliis pinnatis lanceolatis, stipulis semisagittatis, caule simplici*. *Lin. Sp. Plant.* 728. Bitter Vetch with spear-shaped winged leaves, entire half arrow-pointed stipulæ, and a single stalk.

3. *OROBUS foliis pinnatis oblongo-ovatis obtusis, stipulis semisagittatis integerrimis, caule hirsuto*. Bitter Vetch with oblong, oval, obtuse, winged leaves, entire stipulæ half arrow-pointed, and a hairy stalk.

4. *OROBUS caule ramoso, foliis sexjugis ovato-oblongis.* Hort. Cliff. 366. Bitter Vetch with a branching stalk, and leaves composed of six pair of oblong oval lobes.

5. *OROBUS foliis pinnatis lineari-lanceolatis decurrentibus, stipulis semisagittatis, caule simplici.* Bitter Vetch with linear, spear-shaped, winged-leaves, running along the stalk, half arrow-shaped stipulæ, and a single stalk.

6. *OROBUS caule ramoso, foliis quadrijugatis lanceolatis nervosis.* Bitter Vetch with a branching stalk, and leaves composed of four pair of nervous spear-shaped lobes.

7. *OROBUS foliis conjugatis subsessilibus, stipulis dentatis.* Hort. Upsal. 220. Bitter Vetch with leaves placed by couples close to the stalks, and indented stipulæ.

8. *OROBUS foliis pinnatis ovato-oblongis, stipulis rotundato-lunatis dentatis, caule simplici.* Lin. Sp. Plant. 728. Bitter Vetch with oval, oblong, winged leaves, roundish, moon-shaped, indented stipulæ, and a single stalk.

9. *OROBUS foliis pinnatis ovatis acutis, quatuor-jugatis, caule simplici.* Tab. 193. fol. 2. Bitter Vetch with oval, acute-pointed, winged leaves, having four pair of lobes and a single stalk.

10. *OROBUS foliis pinnatis lineari-lanceolatis infernè tomentosiss, caule ramosissimo frutescente.* Bitter Vetch with linear, spear-shaped, winged leaves, which are woolly on their under side, and a very branching shrubby stalk.

11. *OROBUS foliis pinnatis oblongo-ovatis infernè sericeis, caule erecto tomentoso, floribus spicatis terminalibus.* Bitter Vetch with oblong, oval, winged leaves, which are silky on their under side, and have an upright woolly stalk, terminated by a spike of flowers.

12. *OROBUS foliis pinnatis, foliis exterioribus majoribus tomentosiss, caule procumbente.* Bitter Vetch with winged leaves, whole outer lobes are woolly, and the largest trailing stalk.

13. *OROBUS foliis pinnatis, foliolis linearibus villosiss, caule procumbente floribus alaribus & terminalibus.* Bitter Vetch with winged leaves, having hairy linear lobes, a trailing stalk, and flowers growing on the sides at the ends of the branches.

The first sort grows naturally in the forests of *Germany* and *Switzerland*. The root of this is perennial, composed of many strong fibres; the stalks rise a foot high, and are garnished with winged leaves, composed of two pair of oval acute-pointed lobes, and at the base of the foot-stalk is situated a stipula, (or small leaf) shaped like the point of an arrow cut through the middle. This embraces the stalk. The flowers stand upon foot-stalks, which arise from the wings of the stalk; they are about three inches long, sustaining six or seven flowers ranged in a spike, which are of the butterfly kind. These are at first of a purple colour, but afterward change blue; they appear early in the spring, and are succeeded by slender taper pods an inch and a half long, having one cell, in which are lodged four or five oblong bitter seeds, which ripen in *June*. There is a variety with pale flowers, which is preserved in some gardens.

The second sort grows naturally in woods and shady places in most parts of *England*. This hath a perennial creeping root, from which arise angular stalks nine or ten inches long, garnished at each joint by one winged leaf, composed of four pair of smooth spear-shaped lobes, and at the base of each is situated a stipula like that of the first sort; from the wings of the stalks arise the foot-stalks of the flowers, which are about four inches long, each sustaining two or three purplish red flowers, which turn to a deep purple before they fade. These appear in *April*, and are succeeded by long taper pods, containing six or seven roundish seeds, which ripen the beginning of *June*.

The third sort grows naturally in *Cumberland* and *Wales*. The root is perennial and ligneous, from which arise several hairy stalks a foot and a half high, garnished at each

joint with one winged leaf, composed of ten or eleven pair of narrow lobes ranged close together along the midrib, at the base of which is situated an acute stipula embracing the stalk. The flowers are disposed in a close spike standing upon foot-stalks, which arise from the wings of the leaves; they are of a purple colour, and are succeeded by short flat pods, containing two or three seeds. It flowers the beginning of *June*, and the seeds ripen in *July*.

The fourth sort grows naturally on the mountains in *Germany* and *Switzerland*. This hath a strong, ligneous, perennial root, from which arise many branching stalks two feet high, garnished at each joint by one winged leaf; composed of five or six small, oblong, oval lobes, ranged along the midrib. The flowers stand upon very long foot-stalks, which arise from the wings of the stalk; these sustain at their top four, five, or six purple flowers, which appear in *May*, and are succeeded by compressed pods, containing four or five oblong seeds, which ripen the beginning of *July*. The stalks decay in autumn, and new ones arise in the spring.

The fifth sort grows naturally about *Bologna*, and in other parts of *Italy*; this hath a perennial root, composed of many thick fleshy tubers. The stalks are cornered, and rise a foot and a half high, garnished with winged leaves, composed of four pair of linear spear-shaped lobes placed along the midrib, which is bordered by the running of the lobes from one to another; at the base of each leaf is situated a stipula shaped like that of the first, and out of this arises the foot-stalk of the flower, sustaining seven or eight flowers ranged in a loose spike. They are variegated with purple, blue and red, appear in *May*, and are succeeded by pods, containing two or three seeds, which ripen in *July*.

The sixth sort grows naturally on the *Pyrenean* mountains. This hath a perennial root, from which arise several smooth branching stalks a foot and a half high, garnished with winged leaves, composed of four pair of spear-shaped lobes, which have three longitudinal veins; at the base of the leaves is situated a stipula, embracing the stalk in the same manner as the first. The flowers stand upon long foot-stalks, arising from the wings of the leaves; toward the upper part of the stalk they are ranged in a loose spike; are of a purple colour, appearing in *May*, and are succeeded by compressed pods about two inches long, containing three or four seeds, which ripen in *July*.

The seventh sort grows naturally in *Siberia*. This hath a perennial root, from which arise three or four branching stalks about a foot high. The leaves stand opposite along the stalks, to which they fit close, having an indented stipula at their base; they are smooth, stiff, and of a lucid green. The flowers grow in close spikes upon short foot-stalks, which rise from the wings of the leaves at the top of the stalks, where are generally three or four of these spikes standing together. The flowers are of a fine blue colour, so make a pretty appearance. These appear in *June*, and are succeeded by short flattish pods, containing two or three seeds in each, which ripen in *August*.

The eighth sort grows naturally in *Siberia*. This hath a perennial root, from which arise several herbaceous stalks a foot and a half high, garnished with winged leaves, composed of four or five pair of oval oblong lobes, having at their base a roundish moon-shaped stipula embracing the stalk. The flowers come out from the wings of the leaves upon short foot-stalks; they are large, and of a purple colour, appearing in *April*, and are succeeded by swelling pods, containing four or five seeds, which ripen in *June*.

The ninth sort grows naturally in *India*. This hath a perennial root, from which arise two or three single stalks about a foot high, garnished with winged leaves, composed of four pair of oval lobes, ending in acute points; they

are smooth, and of a pale green colour, placed pretty far distant on the midrib. The flowers come out upon slender foot-stalks, which arise from the wings of the leaves, four or five standing at the top; they are of a purple colour, and appear in *February*. These are succeeded by swelling pods, each containing three or four roundish seeds, which ripen in *May*.

The tenth sort grows naturally in *Jamaica*, from whence the late Dr. *Houfoun* sent the seeds. This rises with a very branching stalk about three feet high, which is ligneous; the branches are garnished with winged leaves, composed of five or six pair of narrow spear-shaped lobes, which are woolly on their under side. The flowers grow in loose spikes at the end of the branches, are of a pale purple colour, and are succeeded by smooth compressed pods, each containing five or six roundish seeds.

The eleventh sort was discovered by the late Dr. *Houfoun* at *La Vera Cruz*, from whence he sent the seeds to *England*. This rises with a shrubby stalk five or six feet high, dividing into many slender branches, which are covered with a brown woolly bark, garnished with soft, fatteny, winged leaves; those on the young branches are composed of four pair of oval obtuse lobes, of a brownish green colour, hairy on their upper side, but of a silvery silky hue on their under. The leaves on the upper branches are composed of seven or eight pair of oblong oval lobes, of the same colour and consistence as the lower. The flowers are produced in long erect spikes, at the end of the branches; they are of a deep purple colour, and are succeeded by long, woolly, compressed pods, each containing four or five seeds.

The twelfth sort was discovered by Dr. *Houfoun* at *La Vera Cruz*. This is a low plant, whose stalks bend to the ground, and are seldom more than six or eight inches long, from which come out a few short side branches; they are garnished with winged leaves, composed of four or five pair of small, oblong, oval, woolly lobes, terminated by an odd one, the upper lobes being much larger than the lower. The flowers come out in small bunches, standing upon short foot-stalks, which arise from the wings of the stalk; they are small, of a bright purple colour; these are succeeded by compressed pods, each having six or seven roundish compressed seeds.

The thirteenth sort was discovered at the same time, growing naturally in the same country as the former, by the same gentleman. This hath a pretty thick ligneous root, which sends out many slender stalks a foot and a half long, trailing upon the ground, garnished with winged leaves, composed of three or four pair of narrow hoary lobes, about half an inch long. The flowers come out from the side and at the end of the stalks, three or four standing upon a short foot-stalk; they are small, and of a scarlet colour, and are succeeded by short taper pods, each containing three or four small roundish seeds.

The nine sorts which are first mentioned have perennial roots, but annual stalks; several of these may be propagated by parting their roots; the best time for doing this is in the autumn, that the plants may be well established before the spring; for as several of them begin to put out their stalks very early in the spring, so if they are then disturbed, it will either prevent their flowering, or cause their flowers to be very weak. Most of these plants delight in a shady situation, and love a loamy soil.

They are also propagated by seeds, but these should be sown in the autumn, for if they are kept out of the ground till spring, some of the sorts will never grow, and those which do, seldom vegetate the same year; and the fourth sort I could never raise from seeds sown in the spring, though I have made the trial in different situations many times; but the seeds which have scattered in the summer, have

come up well the following spring, as have also those which were sown in *September*. When the plants come up, they must be kept clean from weeds, and where they are too close together they should be thinned, so as they may have room to grow till the autumn, when they should be transplanted into the places where they are designed to remain. If the roots are strong, they will flower very well the following spring, but those which are weak will not flower till the second year; therefore such may be planted in a shady border at four or five inches distance, where they may grow one year to get strength, and then may be removed to the places where they are to remain. The farther care of them is only to dig the ground between them in winter; and in summer to keep them clean from weeds.

The first, fourth, fifth, seventh, eighth, and ninth sorts, are ornamental plants; and as they are very hardy, requiring little culture, and will thrive in the shade, they deserve a place in every good garden.

The three last mentioned sorts being natives of warm countries, are tender, so must be preserved in stoves, otherwise they will not live in *England*. These are propagated by seeds, which should be sown early in the spring, in small pots filled with light rich earth, and plunged into a hot-bed of tanners bark, observing frequently to moisten the earth, otherwise the seeds will not grow. When the plants come up, they should be carefully taken out of the pots, and each transplanted into separate small pots filled with rich earth, and then plunged again into the tan-bed, observing to shade them until they have taken root; after which time they should have fresh air admitted to them every day in warm weather, and must be frequently watered. With this management the plants will make a great progress. When any of the plants are grown too tall to remain in the hot-bed, they should be taken out, and plunged into the bark-bed in the stove, where they may have room to grow, especially the tenth and eleventh sorts; but the other being of humbler growth, may be kept in the hot-bed until *Michaelmas*, when the nights begin to be cold; at which time they should be removed into the stove, and plunged into the bark-bed, where they must be treated as other tender exotic plants; by which method they may be preserved through the winter, and the following summer they will produce flowers. These plants are perennial, so that if they should not perfect their seeds, the plants may be maintained for several years.

ORYZA. *Tourn. Inst. R. H.* 513. tab. 296. Rice.

The Characters are,

The chaff is small, acute-pointed, having two valves nearly equal, inclosing a single flower. The petal has two valves, which are boat-shaped, ending in a beard or awn. It has a two-leaved nectarium, and six hairy stamina the length of the petal, terminated by summits, whose base are bifid, and a turbinated germen, supporting two reflexed hairy styles, crowned by feathered stigmas. The germen afterward becomes one large, oblong, compressed seed, having two channels on each side, sitting on the petal of the flower.

There is but one Species of this plant, viz.

ORYZA. *Matth.* 403. Rice.

This grain is greatly cultivated in most of the eastern countries, where it is the chief support of the inhabitants; and great quantities of it are brought into *England* and other *European* countries every year, where it is in great esteem for puddings, &c. it being too tender to be produced in these northern countries, without the assistance of artificial heat; but from some seeds which were formerly sent to *South Carolina*, there have been great quantities produced; and it is found to succeed as well there as in its native country, which is a very great improvement to our *American* settlements.

This plant grows upon moist soils, where the ground can be flowed over with water after it is come up; so that whoever would cultivate it in *England* for curiosity, should sow the seeds upon a hot-bed; and when the plants are come up, they should be transplanted into pots filled with rich light earth, and placed into pans of water, which should be plunged into a hot bed; and as the water wastes, so it must, from time to time, be renewed again. In *July* these plants may be set abroad in a warm situation, still preserving the water in the pans, otherwise they will not thrive; and toward the later end of *August* they will produce their grain, which will ripen tolerably well, provided the autumn proves favourable.

OSIER. See *Salix*.

OSMUNDA, the Osmond Royal, or flowering Fern.

This is one of the kinds of Fern which is distinguished from the other sorts, by its producing flowers on the top of the leaves, whereas the others, for the most part, produce them on the back of their leaves.

There is but one kind of this plant, which grows wild in *England*, but there are several sorts of them which grow in *America*; but as they are seldom kept in gardens, I shall not enumerate their species.

The common sort grows on bogs in several parts of *England*, therefore whoever hath an inclination to transplant it into gardens, should place it in a moist shady situation, otherwise it will not thrive.

OSTEOSPERMUM. *Lin. Gen. Plant.* 887. Hard-seeded Chrysanthemum.

The Characters are,

The flower hath an hemispherical empalement, and is composed of several hermaphrodite flowers in the disk, which are tubulous, cut at the brim into five parts. These are surrounded by several female flowers, which are radiated, each having a long narrow tongue, which is cut into three parts at the top. The hermaphrodite flowers have each five slender short stamina, terminated by cylindrical summits, with a small germen supporting a slender style, crowned by an obsolete stigma; these are barren. The female flowers have each a globular germen supporting a slender style, crowned by an indented stigma; the germen afterward becomes one single hard seed.

The Species are,

1. OSTEOSPERMUM *foliis oppositis palmatis*. *Hort. Cliff.* 424. Hard-seeded Chrysanthemum, with palmated leaves growing opposite.

2. OSTEOSPERMUM *foliis ovalibus obsolete serratis*. *Lin. Hort. Cliff.* 424. Hard-seeded Chrysanthemum, with oval leaves which are slightly sawed.

3. OSTEOSPERMUM *foliis lanceolatis acutè dentatis, caule fruticoso*. *Tab.* 194. *fig.* 1. Hard-seeded Chrysanthemum, with spear-shaped leaves which are acutely indented, and a shrubby stalk.

4. OSTEOSPERMUM *spinis ramosis*. *Lin. Hort. Cliff.* 424. Hard-seeded Chrysanthemum, with branching spines.

5. OSTEOSPERMUM *foliis lanceolatis imbricatis sessilibus*. *Flor. Leyd. Prod.* 179. Hard-seeded Chrysanthemum with spear-shaped leaves sitting close to the stalks, and lying over each other like the scales of a fish.

The first sort is a native of *America*, growing in *Virginia* and *New England*, in low moist ground. This sort dies to the root every autumn, and rises again the following spring; and when growing on a moist rich soil, the shoots will rise to the height of five or six feet, and are garnished with very large, angular, divided leaves, placed opposite, which are shaped somewhat like those of the Plane-tree. The flowers are produced at the extremity of the shoots, which are shaped like those of the Sun-flower, but small, so do not make much appearance. This sort never produces any seeds in *England*, so can only be propagated by

parting of the roots, but this should not be done oftener than every third or fourth year. The best season for this, and for transplanting of the roots is in *October*, soon after the shoots decay. These roots should be planted in light rich earth, and should have a moist situation, where they will thrive extremely well; but in dry ground, if they are not duly watered in dry weather, they will make no progress, and frequently decay in hot weather. It will endure the winter's cold very well in the open air.

If the seeds of this plant are procured from *America*, they should be sown on a bed of rich earth, and in dry weather they should be watered. These seeds generally remain in the ground a whole year, before the plants appear. When the plants come up, they should be treated in the same manner as hath been directed for the old plants.

The second sort grows naturally at the *Cape of Good Hope*, but has been several years an inhabitant in the *English* gardens. This rises with a shrubby stalk seven or eight feet high, covered with a smooth gray bark, and divides into several branches, which are garnished with oval leaves, which are unequally indented on their edges; they are placed alternately, and are of a thick consistence, covered with a hoary down, which goes off from the older leaves. The flowers are produced in clusters at the end of the branches, six or eight coming out together; these are yellow, and shaped like those of Ragwort. The border or rays are composed of about ten half florets, which spread open; the disk or middle is composed of tubulous florets, which are cut into five parts at the brim; these are barren, but the half florets round the border have one hard seed, succeeding each of them. This plant flowers but seldom here; the time of its flowering is in *July* or *August*.

The third sort grows like the second, but the leaves are more pointed, of a green colour, and acutely sawed on the edges; the foot-stalks of the leaves are bordered, and the leaves are deeply veined. This produces tufts of yellow flowers at the extremity of the shoots from spring to autumn, and frequently ripens seeds.

The fourth sort is a low shrubby plant, which seldom rises above three feet high, and divides into many branches; the ends of the shoots are beset with green branching spines; the leaves are very clammy, especially in warm weather; these are long and narrow, and set on without any order. The flowers are produced singly at the ends of the shoots, which are yellow, and appear in *July* and *August*.

These three sorts are too tender to live in the open air in *England*, so are placed in the green-house in *October*, and may be treated in the same manner as Myrtles, and other hardy green-house plants, which require a large share of air in mild weather; and in the beginning of *May* the plants may be removed into the open air, and placed in a sheltered situation during the summer season. The second and third sorts must have plenty of water, being very thirsty plants, but the fourth sort must have it given but moderately, especially in winter.

These plants are propagated by cuttings, which may be planted in any of the summer months, upon a bed of light earth, and should be watered and shaded until they have taken root, which they will in five or six weeks, when they must be taken up, and planted in pots; for if they are suffered to stand long, they will make strong vigorous shoots, and will be difficult to transplant afterward, especially the second and third sorts; but there is not so much danger of the fourth, which is not so vigorous, nor so easy in taking root as the other. During the summer season the pots should be frequently removed, to prevent the plants from rooting through the holes in the bottom of the pots into the ground, which they are very apt to do when they continue long undisturbed, and then they shoot very luxuriantly; and,

and, on their being removed, these shoots, and sometimes the whole plants, will decay.

The fifth sort grows naturally at the *Cape of Good Hope*. This hath a shrubby stalk about four feet high, which divides into many small branches, garnished with small oblong leaves, which sit close to them, and in some of the upper branches they lie over each other like the scales of fish. The flowers come out at the end of the branches, standing singly upon foot-stalks, which are about an inch long; the half florets, which compose the border or rays, are acute-pointed and spread open; the disk is composed of florets, which are barren. This sort is propagated by cuttings, in the same manner as the other sorts, and must be treated in the same way.

OSYRIS. *Lin. Gen. Plant.* 978. Poets Casia.

The Characters are,

It is male and female in different plants; the empalement of the flower is of one leaf, which is divided into three acute segments. The flower hath no petals, but those on the male plants have three short stamina; the female have a germen, which afterward changes to a globular berry, having a single seed.

We have but one Species of this plant, viz.

OSYRIS *frutescens baccifera*. C. B. P. Shrubby Berry-bearing Poets Casia; and by some Red-berried shrubby Casia.

This is a very low shrub, seldom rising above two feet high, having ligneous branches, which are garnished with long narrow leaves, of a bright colour. The flowers appear in June, which are of a yellowish colour, and are succeeded by berries, which at first are green, and afterward turn to a bright red colour, somewhat like those of Asparagus.

This plant grows wild in the south of France, in Spain, and some parts of Italy, by the side of roads, as also between the rocks, but is with great difficulty transplanted into gardens, nor does it thrive after being removed; so that the only method to obtain this plant is, to sow the berries where they are to remain. These berries commonly remain a year in the ground before the plants appear, and sometimes they will lie two or three years, so that the ground should not be disturbed under three years, if the plants do not come up sooner. These seeds must be procured from the places where the plants naturally grow, for those which have been brought into gardens never produce any, and it is with great difficulty they are preserved alive.

OTHONNA. *Lin. Gen. Plant.* 888. Ragwort.

The Characters are,

It hath a radiated flower, composed of hermaphrodite florets, which form the disk, and female half florets, which form the rays or border; these are included in one common single empalement of one leaf. The hermaphrodite flowers are tubulous, indented at the top in five parts; the female half florets are stretched out like a tongue, and the point has three indentures, which are reflexed. The hermaphrodite florets have short hairy stamina, terminated by cylindrical summits, and an oblong germen supporting a slender style, crowned by a single stigma. The female half florets have oblong germen with a slender style, crowned by a large, bifid, reflexed stigma. The hermaphrodite florets are seldom fruitful, but the female half florets have an oblong seed, which is sometimes naked, and at others crowned with down; these sit in the permanent empalement.

The Species are,

1. OTHONNA *foliis pinnatifidis tomentosis, laciniis sinuatis, caule fruticoso*. Hort. Upsal. 273. Othonna with woolly wing-pointed leaves, sinuated jags, and a shrubby stalk; Sea Ragwort.

2. OTHONNA *foliis oblongo-ovatis, pinnato-sinuatis, superne viridi-nigris, inferne tomentosis, caule fruticoso*. Othonna with oblong, oval, wing, sinuated leaves, of a dark green on their upper side, woolly on their under, and a shrubby stalk broad-leaved Sea Ragwort,

3. OTHONNA *foliis reniformibus suborbiculatis denticulatis petiolatis*. *Lin. Sp. Plant.* 924. Othonna with kidney-shaped, orbicular, indented leaves, having foot-stalks.

4. OTHONNA *foliis infimis lanceolatis integerrimis, superioribus sinuato-dentatis*. Hort. Cliff. 419. Othonna with spear-shaped lower leaves, which are entire, and the upper ones indented in sinuses.

5. OTHONNA *foliis lanceolatis integerrimis*. Hort. Cliff. 419. Othonna with spear-shaped entire leaves.

6. OTHONNA *foliis cuneiformibus integerrimis sessilibus, caule fruticoso procumbente, pedunculis longissimis*. Othonna with entire wedge-shaped leaves sitting close, a shrubby trailing stalk, and very long foot-stalks to the flowers.

7. OTHONNA *foliis pinnatifidis, laciniis linearibus parallelis*. Hort. Cliff. 419. Othonna with wing-pointed leaves, whose segments are narrow and parallel.

8. OTHONNA *foliis multifido-pinnatis linearibus*. Flor. Leyd. Prod. 380. Othonna with very narrow leaves, ending in many winged points.

9. OTHONNA *foliis ovato-cuneiformibus dentatis*. *Lin. Sp. Plant.* 926. Othonna with oval, wedge-shaped, indented leaves.

10. OTHONNA *foliis ovato-lanceolatis denticulatis subtus tomentosis, floribus corymbosis*. Othonna with oval, spear-shaped, indented leaves, which are woolly on their under side, and flowers growing in a corymbus.

There are some other species of this genus, some of which grow naturally in England, and being troublesome weeds, are not admitted into gardens, so I have not enumerated them here.

The first sort is the common Sea Ragwort, which has been supposed to grow naturally near the sea in some parts of England; but I have never yet met with it wild in any part where I have been, nor have I heard that any other person has seen it growing naturally here. It grows in great plenty on the sea coast in France and Italy. This sends out many shrubby stalks, which rise from two to three feet high; they are hoary, and are garnished with woolly leaves six or eight inches long, jagged to the midrib in five or six parts; the jags are opposite, narrowest at their base, and at their points are divided into three or four obtuse segments; the stalks have a few leaves toward the bottom of the same shape, and are terminated with yellow flowers growing in a corymbus; these are succeeded by downy seeds, which ripen in the autumn.

The seeds of the second sort I received from the Mediterranean, where it grows naturally. This hath shrubby stalks, which rise three or four feet high, covered with a hoary down, and garnished with leaves from two to three inches long, and an inch and a half broad, standing on very long foot-stalks; they are regularly sinuated on their edges, in form of winged leaves; the under side of the leaves are hoary, but their upper side are of a blackish green colour. The flowers grow in small clusters at the end of the branches; they are of a deep yellow colour, and are succeeded by downy seeds like the first. This is a very different plant from the first, and always retains its difference from seeds. There are two varieties of the first sort, mentioned by Tournefort, which he found growing naturally in the Levant; but these I have frequently propagated by seeds, and have always found them vary; sometimes the leaves became green on both sides, and at others only on their upper side, so that these are not worthy of being noticed.

The third sort grows naturally at the Cape of Good Hope, from whence the seeds were brought to Holland in 1697, where the plants were raised, and have since been communicated to most of the curious gardens in Europe. This hath a root composed of many small fibres; the stalks are round, branching, and weak; they are herbaceous, hairy, and

and trail upon the ground, if they are not supported, dividing into a great number of branches, garnished with roundish indented leaves, not unlike those of Ground-ivy, hollowed at their base; the flowers are produced at the end of the stalks in loose umbels; they are radiated; the rays are yellow, like those of common Ragwort; the disk is composed of hermaphrodite flowers of a dark colour; the seeds have a down on their top.

The fourth sort grows naturally in *Æthiopia*. This rises with a shrubby stalk four or five feet high, dividing into several branches, which are garnished with grayish leaves placed without order; those on their lower part being narrow and entire, but the others are indented on the edges after the manner of Hartshorn. The flowers are produced in loose umbels at the end of the branches; they are yellow, and are succeeded by downy seeds.

The fifth sort grows naturally at the *Cape of Good Hope*. This rises with a round stalk, which at first is herbaceous, but afterward becomes ligneous, dividing into many branches, which rise from three to four feet high, garnished with thick, succulent, grayish leaves, placed without order; these are narrow at their base, and broad toward their points, entire, and sit close to the branches. The flowers are produced on branching foot-stalks at the end of the larger branches, each flower standing upon a separate foot-stalk; they have broad yellow rays, with a large disk in the middle, and are succeeded by downy seeds.

The sixth sort was discovered by the late Dr. *Shaw*, growing naturally near *Tunis* in *Africa*, from whence he brought the seeds. This sends out many ligneous stalks from the root, which spread out on every side, declining toward the ground, and are garnished with grayish leaves, which are narrow at their base, enlarging upward, and are broad at their points, where they are rounded; these sit close to the stalks. The flowers are produced upon long, thick, succulent foot-stalks at the end of the branches; they are yellow; the rays are sharp-pointed, and not much longer than the empalement; the disk is large, and the florets are as long as the empalement; the seeds are crowned with a long down.

The seventh sort grows naturally at the *Cape of Good Hope*, from whence the seeds were brought to *Holland*, and the plants were raised in the *Amsterdam* garden in 1699. This rises with a shrubby stalk about the thickness of a man's finger two feet high, which divide into many branches; these are covered with a hoary down, and are garnished with hoary leaves about three inches long and one broad, cut into many narrow segments almost to the midrib; these segments are equal and parallel, and are indented at their ends into two or three points. The flowers are produced on long foot-stalks, which arise from the wings of the stalks; toward the end of the branches they have large yellow rays or borders, with a disk of florets, and are succeeded by oblong purple seeds crowned with down.

The eighth sort grows naturally on the hills near the *Cape of Good Hope*, and was raised from seed in the *Amsterdam* garden. This hath a low, shrubby, branching stalk; the leaves are thick, like those of Samphire, and are cut into many narrow segments. The flowers are produced on short foot-stalks at the end of the branches; they are yellow, and shaped like the other species of this genus, and are succeeded by brown seeds crowned with soft down.

The ninth sort grows naturally at the *Cape of Good Hope*. This hath a thick shrubby stalk, dividing into several branches, which rise five or six feet high; the leaves come out in clusters from one point, spread on every side; they are smooth, narrow at their base, enlarging gradually to their points, which are rounded; their edges are acutely indented like those of the Holly. From the center of the

leaves arise the foot-stalks of the flowers, which are five or six inches long, branching out into several smaller, each sustaining one yellow radiated flower, shaped like the former; these are succeeded by slender seeds crowned with down.

The tenth sort grows naturally in *Jamaica*, from whence the late Dr. *Houfoun* sent the seeds to *England*. This rises with a shrubby stalk seven or eight feet high, which is covered with a hoary down, and garnished with oval, spear-shaped, smooth leaves, of a dark green on their upper side, but very white and woolly on their under, standing alternately on short woolly foot-stalks. The upper part of the stalk is naked, and at the top divides into five or six foot-stalks, each sustaining a roundish bunch of yellow radiated flowers, which are succeeded by slender seeds crowned with down.

The first sort was formerly preserved in green-houses, and was supposed too tender to live abroad in the open air; but later experience has taught us that the cold will not destroy it, provided it is planted on a lean dry soil; but in rich moist ground the plants grow too vigorous in the summer, so their branches being replete with moisture, are sometimes killed in very severe winters. This is easily propagated by slips or cuttings during any of the summer months, which may be planted in a shady border, and now and then refreshed with water; in about six weeks or two months they will have good roots: then they may be transplanted to the places where they are to remain, shading them from the sun, and supplying them with water until they have taken new root; after which they will require no other care, but to keep them clean from weeds. This sort flowers most part of summer, but they have little beauty; however the plants are preserved more for the variety of their hoary divided leaves.

The second sort is not quite so hardy as the first; but if it is planted in a warm situation, and on a dry soil, it will live abroad through our ordinary winters very well, but in severe frosts they are sometimes killed. This may be propagated by slips or cuttings, in the same way as the first.

The third sort is too tender to live in the open air through the winter, but may be preserved, with a little protection, in hard frost, and requires as much free air as possible in mild weather; so if it is sheltered under a common frame in winter, it will thrive better than in a green-house. It is easily propagated by cuttings, in the same way as the first.

The third, fourth, fifth, seventh, eighth, and ninth sorts, are preserved in green-houses through the winter, but require no artificial warmth; if these are protected from the frost it is sufficient, and in mild weather they must have a large share of free air. In the summer they must be placed abroad in a sheltered situation, among other hardy exotick plants, where they will add to the variety, and flower great part of the summer. These may be all propagated by cuttings during any of the summer months, which may be planted upon an old hot-bed, and covered with glasses, shading them from the sun in the heat of the day. When these have taken root, they should be planted each into a separate pot, filled with soft loamy earth, placing them in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till autumn, treating them in the same way as the old plants.

The sixth sort will live in the open air, if it is planted in a warm situation and a dry soil. Some of these plants have endured the open air for more than twenty years in the *Chelsea* garden, without protection. It is easily propagated by cuttings, in the same way as the former.

The tenth sort is too tender to live through the winter in *England* without artificial warmth, therefore the plants should be placed in a stove kept to a moderate temperature of warmth, for the plants are apt to draw up weak when they

are in too great heat; these require to be frequently refreshed with water in winter, but it must not be given them in too great quantity during that season. In the latter end of *June* the plants should be removed into the open air, placing them in a warm sheltered situation; and in warm dry weather they will require a greater quantity of water. This sort will grow by cuttings, which should be planted on a moderate hot-bed the beginning of *July*, and shaded till they have taken root; then they may be each planted in a separate small pot, filled with loamy earth, placing them under a frame till they have taken new root, after which they must be gradually inured to the open air, and treated as the old plants.

OXALIS. *Lin. Gen. Plant.* 515. Wood Sorrel.

The Characters are,

The empalement of the flower is permanent, and cut into five acute parts. The flower is of one petal, cut into five obtuse indented segments; it hath ten erect hairy stamina, and a germen with five angles, supporting five slender styles. The germen afterward becomes a five-cornered capsule with five cells, which open longitudinally at the angles, containing roundish seeds, which are thrown out with an elasticity on the touch when ripe.

The Species are,

1. OXALIS *scapo uniflora, foliis ternatis, radice squamoso-articulata.* *Hort. Cliff.* 175. Common Wood Sorrel with one flower on a foot-stalk, trifoliate leaves, and a scaly-jointed root.

2. OXALIS *caule ramoso diffuso, pedunculis umbelliferis.* *Hort. Cliff.* 175. Wood Sorrel with a branching diffused stalk, and umbellated foot-stalks.

3. OXALIS *caule ramoso erecto, pedunculis umbelliferis.* *Flor. Virg.* 161. Wood Sorrel with a branching upright stalk, and umbellated foot-stalks.

4. OXALIS *pedunculis unifloris, caule dichotomo.* *Lin. Sp. Plant.* 443. Wood Sorrel with one flower on a foot-stalk, and spreading stalks.

5. OXALIS *scapo uniflora, foliis ternatis, radice bulbosa.* *Hort. Cliff.* 175. Wood Sorrel with a foot-stalk supporting one flower, trifoliate leaves, and a bulbous root, with large purple flowers.

6. OXALIS *scapo umbellifero, foliis ternatis bipartitis.* *Lin. Sp. Plant.* 434. Wood Sorrel with an umbelliferous stalk, and trifoliate leaves divided in two parts.

7. OXALIS *caule erecto fruticoso, foliis ternatis, impari maximo.* Wood Sorrel with an upright shrubby stalk, and trifoliate leaves, the middle one being very large.

The first sort grows naturally in moist shady woods, and close to hedges in many parts of *England*, so is but seldom admitted into gardens; though whoever is fond of acid herbs in salads, can scarce find a more grateful acid in any other plant. The roots of this sort are composed of many scaly joints, which propagate in great plenty. The leaves arise immediately from the roots upon single long foot-stalks, are composed of three heart-shaped lobes, which meet in a center where they join the foot-stalk; they are of a pale green, and hairy; between these come out the flowers upon pretty long foot-stalks, each sustaining one large white flower of the open bell shape. They appear in *April* and *May*, and are succeeded by five-cornered oblong seed-vessels, having five cells inclosing small brownish seeds; when these are ripe, the seed-vessels burst open on the least touch, and cast out the seeds to a considerable distance. This is the sort which is directed for medicinal use in the dispensaries, but those people who supply the market with herbs, generally bring the third sort, which is now become common in the gardens; but this hath no acid, so is unfit for the purpose; but as it rises with an upright branching stalk, so it is soon gathered and tied up in bunches; whereas the leaves of the first grow singly from the root, and require more

time in gathering. There is a variety of the first sort with a purplish flower, which grows naturally in the north of *England*, but as it does not differ from it in any other respect, I have not enumerated it.

The second sort is an annual plant, which grows naturally in woods and shady places in *Italy* and *Sicily*. The root of this is long, slender, and fibrous; the stalks trail upon the ground, spreading out eight or nine inches wide on every side, dividing into small branches; the leaves stand upon pretty long foot-stalks, and are composed of three heart-shaped lobes, which have deeper indentures at their points, than those of the first sort. The flowers are yellow, growing in form of an umbel upon pretty long slender foot-stalks, arising from the side of the branches. These appear in *June* and *July*, and are succeeded by seed-vessels near an inch long, which open with an elasticity, and cast out the seeds.

The third sort grows naturally in *Virginia* and other parts of *North America*, from whence the seeds were formerly brought to *Europe*; but wherever this plant has been once introduced and suffered to ripen seeds, it has become a common weed. This is an annual plant, rising with a branching herbaceous stalk eight or nine inches high; the leaves stand upon very long foot-stalks, and are shaped like those of the second sort. The flowers are yellow, standing in a sort of umbel, upon long, slender, erect foot-stalks; the seed-vessels and seeds are like those of the second sort.

These three sorts require no particular culture; if the roots of the first sort are taken up and transplanted in a shady moist border, they will thrive and multiply exceedingly; and, if they are kept clean from weeds, will require no other care. If the seeds of the other two sorts are sown in an open border, the plants will rise freely, and require no care; for if they are permitted to scatter their seeds, there will be a plentiful supply of the plants.

The fourth sort hath a roundish bulbous root, from which come out slender stalks about six inches high, which divide into branches by pairs, and from the divisions come out the foot-stalks of the leaves; these are long, slender, and sustain a trifoliate leaf, composed of three small, roundish, heart-shaped lobes. The foot-stalks of the flowers are long, slender, and arise from the division of the stalks, each sustaining one purplish flower about the same size and shape as those of the first sort. This flowers in *May*, *June*, and *July*, and sometimes produces ripe seeds in *England*. It grows naturally at the *Cape of Good Hope*, so is too tender to live through the winter in the open air in *England*; but if it is sheltered from hard frost, under a common frame in winter, it will require no other protection. It propagates in plenty by offsets from the root, as also by bulbs, which come out from the side of the stalks.

The fifth sort grows naturally at the *Cape of Good Hope* in such plenty, that the earth which came from thence, in which some plants were brought to *England*, was full of it. This hath a roundish bulbous root, covered with a brown skin sending out strong fibres, which strike deep into the ground; the leaves are trifoliate, composed of three roundish, large, hairy lobes, which are but little indented at the top; these stand upon long slender foot-stalks, which arise from a thick short stalk, which adheres to the root. The foot-stalks of the flowers arise between the leaves, each supporting one large purple flower; these appear in *January* and *February*, but are rarely succeeded by seeds here, but the roots put out offsets in great plenty, whereby it is propagated. This will not thrive in winter in the open air here, so the roots should be planted in pots, which may be sheltered under a common frame in winter, where it may have as much free air as possible in mild weather, otherwise

the leaves will draw up weak; for the leaves of this plant come out in *October*, and continue growing till *May*, when they begin to wither and decay. The roots may be transplanted any time after the leaves decay, till they begin to push out again.

The sixth sort is a native of the same country as the fifth; the roots of this are bulbous; the leaves stand upon long slender foot-stalks, which arise from a head; they are composed of three lobes, which are for the most part divided into two parts almost to their base. The foot-stalks of the flowers are five or six inches long, sustaining several large yellow flowers ranged in form of an umbel. These appear in *March*, and are sometimes succeeded by seeds here. This requires the same treatment as the fifth.

The seventh sort was discovered by *Plumier* in some of the *French colonies in America*, and was since found growing plentifully at *La Vera Cruz* by the late *Dr. Houstoun*. It rises with a shrubby stalk a foot and half high, sending out several slender branches, which are garnished with trifoliate small leaves, composed of three oval lobes, the middle one being twice as large as the side ones. They are

placed opposite, and sometimes by threes round the stalk, standing upon short foot-stalks. The foot-stalks of the flowers arise from the wings of the stalks, which are near two inches long, each sustaining four or five yellow flowers, whose petals are not much longer than the empalement; each of these have a smaller foot-stalk which is crooked, so that the flowers hang downward.

This is much tenderer than either of the former, so requires to be placed in a stove kept to a moderate degree of warmth in winter. It is propagated by seeds, which must be sown in pots, and plunged into a moderate hot-bed, and when the plants come up, they should be each planted in a separate pot filled with light sandy earth, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; after which they must be treated in the same manner as other tender plants from the same country.

OX-EYE. See *Buphthalmum*.

OXYACANTHA. See *Berberis*.

OXYS. See *Oxalis*

P.

P A D

PADUS. *Lin. Gen. Edit. prior.* 476. The Bird Cherry, or Cherry Laurel.

The Characters are,

The empalement of the flower is bell-shaped. The flower hath five large roundish petals, which spread open, and are inserted in the empalement. It hath from twenty to thirty awl-shaped stamina, which are inserted in the empalement, and a roundish germen supporting a slender style. The germen afterward becomes a roundish fruit, inclosing an oval-pointed nut having rough furrows.

The Species are,

1. PADUS glandulis duobus, basi foliorum subjectis. *Hort. Cliff.* 185. Bird Cherry with two glands at the base of the leaves.

2. PADUS foliis lanceolato-ovatis deciduus, petiolis biglandulosis. *Tab.* 196. fol. 2. Bird Cherry with spear-shaped, oval, deciduous leaves, whose foot stalks have two glands; commonly called by the gardeners *Cornish Cherry*.

3. PADUS foliis oblongo-ovatis serratis acuminatis deciduus, basi antice glandulosis. Bird Cherry with oblong, oval, sawed, acute-pointed, deciduous leaves, and glands on the fore part of the foot-stalk; *American Bird Cherry*.

4. PADUS foliis sempervirentibus lanceolato-ovatis. *Hort. Cliff.* 42. Bird Cherry with ever-green, spear-shaped, oval leaves; or common Laurel.

5. PADUS foliis oblongo-ovatis sempervirentibus eglandulosis. Bird Cherry with oblong, oval, ever-green leaves having glands; smaller *Portugal Laurel*, called *Asarero* by the *Portuguese*.

6. PADUS foliis lanceolatis acutè denticulatis sempervirentibus. Ever-green Bird Cherry with spear-shaped leaves, having small acute indentures; called in *America* *Bastard Mahogany*.

The first sort grows naturally in the hedges in *Yorkshire*,

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and many of the northern counties in *England*, as also in some few places near *London*, but is propagated as a flowering shrub in the nursery-gardens for sale. This rises with several woody stalks to the height of ten or twelve feet. The branches, which grow wide and scattering, are covered with a purplish bark, and garnished with oval spear-shaped leaves placed alternate, and have two small protuberances or glands, at their base. The flowers are produced in long loose bunches from the side of the branches; they have five roundish petals, which are much smaller than those of the Cherry, and are inserted in the border of the empalement; and within these are a great number of stamina, which also are inserted in the empalement; they have a strong scent, which is very disagreeable to most persons. These flowers appear in *May*, and are succeeded by small roundish fruit, which are first green, afterward turn red, and when ripe, are black, inclosing a roundish furrowed stone or nut, which ripens in *August*.

The second sort grows naturally in *Armenia*, from whence I have received the seeds, but has been many years propagated in the nursery-gardens about *London*, where it is generally called *Cornish Cherry*. This sort has been often confounded with the first, many of the late writers in botany having supposed it was the same species; but I have raised both sorts from seeds, and have always found the young plants to retain their difference. This rises with a strait upright stem more than twenty feet high; the branches are shorter and broader than those of the other, and are not so rough; the flowers grow in closer shorter spikes, which stand more erect; the fruit is larger, and red when ripe. This flowers a little after the first sort.

The third sort grows naturally in *Virginia*, and other parts of *North America*. It rises with a thick stem from ten to thirty feet high, dividing into many branches, which have a dark

a dark purple bark, and are garnished with oval leaves, placed alternately on short foot-stalks, of a lucid green, and slightly sawed on their edges, continuing in verdure as late in the autumn as any of the deciduous trees. The flowers come out in bunches like those of the second sort, and are succeeded by larger fruit, which is black when ripe, and is soon devoured by the birds. The wood of this tree is beautifully veined with black and white, and will polish very smooth, so is frequently used for cabinet work; as is also the wood of the first sort, which is much used in *France*, where it is called, *Bois de Sainte-Lucie*.

The fourth sort is the common Laurel, which is now so well known as to need no description. This grows naturally about *Trebisond*, near the *Black Sea*, and was brought to *Europe* 1576, and is now become very common, especially in the warmer parts of *Europe*.

The fifth sort was brought to *England* from *Portugal*, but whether it is a native of that country, or was introduced there from some other, is hard to determine. The *Portuguese* call it *Asarero*, or *Azerero*. This was supposed to have been but a low ever-green shrub, but by experience we find, that when it is in a proper soil, it will grow to a large size. There are at present some of these trees whose trunks are more than a foot diameter, and ten or twelve feet high, which are not of many years standing, and are well furnished with branches, which when young have a reddish bark; the leaves are shorter than those of the common Laurel, approaching near to an oval form; they are of the same consistence, and of a lucid green, which mixing with the red branches, make a beautiful appearance. The flowers are produced in long loose spikes from the side of the branches; they are white, and shaped like those of the common Laurel, appearing in *June*, and are succeeded by oval berries smaller than those of the common Laurel; they are first green, afterward red, and when ripe are black, inclosing a stone like the *Cherry*.

The seeds of the sixth sort were sent from *Carolina*, by the title of Bastard Mahogany, from the colour of the wood, which is somewhat like Mahogany. This seems to be little more than a shrub, if we may judge from its growth here; the stalk does not rise in height, but sends out lateral branches, which spread on every side, covered with a brown bark, and garnished with spear-shaped leaves near two inches long, and three quarters of an inch broad, with small acute indentures on the edges; they stand alternately upon very short foot-stalks, and are of a lucid green, continuing their verdure all the year. This has not as yet flowered in *England*, so I can give no account of it; but by the seeds and description which I received of its flowers, it belongs to this genus.

This plant will live in the open air, if it is planted in a warm situation, and sheltered in severe frost, especially while the plants are young; but when they have acquired strength, there is no doubt of their thriving very well in the open ground. It may be propagated in the same manner as the *Portugal Laurel* from the berries, and if the branches are laid down they will take root.

The three first sorts are easily propagated, either by the seeds or layers; when they are propagated by the seeds they should be sown in autumn, for if they are kept out of the ground till spring, they seldom grow till the second year. They may be sown upon a bed or border of good ground, in the same way as *Cherry stones*, which are designed for stocks; and the young plants may be treated in the same manner, planting them out in a nursery, where they may stand two years to get strength, and then they may be transplanted to the places where they are to remain. They are usually intermixed with other flowering shrubs, in wilderness work, where they add to the variety.

If they are propagated by layers, the young shoots should be laid down in the autumn, which will have good roots by that time twelvemonth, when they may be separated from the old plants, and transplanted into a nursery for a year or two, to get strength, and may then be removed to the places where they are to grow.

The third sort will grow to be a very large tree, when it is planted in a moist soil, but in dry ground it rarely rises more than twenty feet high. There have been some plants of late years raised from seeds which came from *Carolina*, which have all the appearance of the third sort, but are of much humbler growth; whether this may proceed from their being brought from a warmer climate, so do not agree with the cold of our winters, or whether they are a different species from that I cannot yet determine, as they have not produced fruit here.

The Laurel may be easily propagated by planting of cuttings; the best time for doing this in *September*, as soon as the autumnal rains fall to moisten the ground; the cuttings must be the same year's shoots, and if they have a small part of the former year's wood to their bottom, they will more certainly succeed, and form better roots. These should be planted in a soft loamy soil about six inches deep, pressing the earth close to them. If they are properly planted, and the ground is good, there will be few of the cuttings fail; and if they are kept clean from weeds the following summer, they will make good shoots by the following autumn, when they may be transplanted into a nursery, where they may grow two years to get strength, and then should be removed to the places where they are to remain. These plants were formerly kept in pots and tubs, and preserved in green houses in winter; but afterward they were planted against warm walls, to preserve them, being frequently injured by severe frost. After this the plants were trained into pyramids and globes, and constantly kept sheered; by which the broad leaves were generally cut in the middle, which rendered the plants very unsightly. Of late years they have been more properly disposed in gardens, by planting them to border woods, and the sides of wilderness quarters, for which purpose we have but few plants so well adapted; for it will grow under the drip of trees, in shade or sun; and the branches will spread to the ground, so as to form a thicket; and the leaves being large, and having a fine glossy green colour, set off the woods and other plantations in winter, when the other trees have cast their leaves; and in summer they make a good contrast with the green of the other trees. These trees are sometimes injured in very severe winters, especially where they stand single, and are much exposed; but where they grow in thickets, and are screened by other trees, they are seldom much hurt; for in those places it is only the young tender shoots which are injured, and there will be new shoots produced immediately below these from the larger branches, to supply their place, so that in one year the damage will be repaired. But whenever such severe winters happen, these trees should not be cut or pruned till after the following *Midsummer*; by which time it will appear what branches are dead, which may then be cut away, to the places where the new shoots are produced; for by hastily cutting these trees in the spring, the drying winds have free ingress to the branches; whereby the shoots suffer as much, if not more, than they had done by the frost.

In warmer countries this tree will grow to a large size, so that in some parts of *Italy* there are large woods of them, but we cannot hope to have them grow to so large stems in *England*; for should these trees be pruned up, in order to form them into stems, the frost would then become much more hurtful to them, than in the manner they usually grow, with their branches to the ground: however, if these

trees are planted pretty close together in large thickets, and permitted to grow rude, they will defend each other from the frost, and they will grow to a considerable height: an instance of which is now in that noble plantation of ever-green trees, made by his Grace the Duke of Bedford, at *Wooburn-Abbey*; where there is a considerable hill, covered entirely with Laurels; and in the other parts of the same plantation, there are great numbers of these intermixed with the other ever-green trees, where they are already grown to a considerable size, and make a noble appearance.

The best season for transplanting the plants is in the autumn, as soon as the rain has prepared the ground for planting; for although they often grow when removed in the spring, yet those do not take so well, nor make so good progress, as those which are removed in the autumn, especially if the plants are taken from a light soil, which generally falls away from their roots; but if they are taken up with balls of earth to their roots, and removed but a small distance, there will be no danger of transplanting them in the spring, provided it is done before they begin to shoot; for as these plants will shoot very early in the spring, so if they are removed after they have shot, the shoots will decay, and many time the plants entirely fail.

There are some persons who, of late have banished these plants from their gardens, as supposing them possessed of a poisonous quality, because the distilled water has proved so in many instances; but however the distilled water may have been found destructive to animals, yet from numberless experiments, which hath been made both of the leaves and fruit, it hath not appeared that there is the least hurtful quality in either; so that the whole must be owing to the oil, which may be carried over in distillation.

The berries have been long used to put into brandy, to make a sort of ratafia, and the leaves have also been put into custards, to give them an agreeable flavour; and although these have been for many years much used, yet there have been no instance of their having done the least injury; and as to the berries, I have known them eaten in great quantities without prejudice.

There are some persons who have grafted the Laurel upon Cherry stocks, with design to enlarge the trees; but although they will take very well upon each other, yet they seldom make much progress, when either the Laurel is grafted on the Cherry, or the Cherry upon the Laurel; so that is only a matter of curiosity, attended with no real use: and I would recommend to persons who have this curiosity, to graft the Laurel upon the *Cornish* Cherry, rather than any other sort of stock, because the graft will unite better with this; and as it is a regular tree and grows large, so it will better answer the purpose of producing large trees.

The *Portugal* Laurel may be propagated in the same way as the common Laurel, either by cuttings, layers, or seeds. If the cuttings are planted at the same season, and in the same way as hath been directed for the common Laurel, they will take root very freely; or if the young branches are laid in the autumn, they will take root in one year, and may then be removed into a nursery, where they may grow a year or two to get strength, and then transplanted where they are to remain.

But although both these methods are very expeditious for the propagating these plants, yet I would recommend the raising them from the berries, especially where they are designed for tall standards; for the plants which are propagated by cuttings and layers, put out more lateral branches and become bushy, but are not so well inclined to grow upright, as those which come from seeds; and as there are

now many trees in the *English* gardens which produce plenty of berries every year, so if they are guarded from birds till they are ripe, there may be a supply of them sufficient to raise plants enough, without propagating them any other way. These berries must be sown in the autumn, and treated in the same way as the common Laurel.

This tree is much hardier than the common Laurel, for in the severe frost of the year 1740, when great numbers of Laurels were entirely killed, and most of them lost their young shoots, this remained unhurt in perfect verdure, which renders it more valuable; and as by the appearance of some trees now growing in the gardens, they seem as if they will grow to a large size, so it is likely to be one of the most ornamental ever-greens we have.

PÆONIA. *Tourn. Inst. R. H.* 275. tab. 146. The Peony.

The Characters are,

The flower has a permanent empalement, composed of five concave reflexed leaves. The flower hath five large, roundish, concave petals which spread open, and a great number of short-hairy stamina, with two, three, or four, oval, erect, hairy germen in the center, having no styles. The germen afterward become so many oval, oblong, reflexed, hairy capsules, having one cell, opening longitudinally, containing several oval, shining, coloured seeds, fixed to the furrow.

The Species are,

1. PÆONIA foliis lobatis ex ovato-lanceolatis. Haller. *Helv.* 311. Peony with lobated leaves which are oval, and spear shaped; or Male Peony.

2. PÆONIA foliis difformiter lobatis. Haller. *Helvet.* 311. Peony with difformed lobated leaves; common or Female Peony.

3. PÆONIA foliis difformiter lobatis, lobis incis, petalis florum rotundioribus. Peony with difformed lobated leaves, which are cut, and rounder petals to the flower; Foreign Peony, with a deep red flower.

4. PÆONIA foliis lobatis, lobis lanceolatis integerrimis. Peony with lobated leaves, whose lobes are spear-shaped and entire.

5. PÆONIA foliis difformiter lobatis pubescentibus. Tab. 199. Peony with difformed lobated leaves, which are downy.

6. PÆONIA foliis lobatis, lobis ovatis infernè incanis. Peony with lobated leaves, whose lobes are oval and hoary on their under side; or *Portugal* Peony, with a single sweet flower.

The first sort here enumerated, is the common Male Peony, which grows naturally in the woods on the *Helvetian* mountains. The root of this is composed of several oblong knobs, shaped like the dugs of a cow, which hang by strings fastened to the main head; the stalks rise about two feet and a half high, which are garnished with leaves composed of several oval lobes, some of which are cut into two or three segments; they are of a lucid green on their upper side, but are hoary on their under. The stalks are terminated by large single flowers, composed by five or six large roundish red petals, inclosing a great number of stamina, terminated by oblong yellow summits. In the center is situated two, three, or sometimes five germen, which join together at their base; they are covered with a whitish hairy down; these afterward spread asunder, and open longitudinally, exposing the roundish seeds, which are first red, then purple, and when perfectly ripe turn black. The flowers appear in *May*, and the seeds ripen in the autumn.

There is one variety of this with pale, and another with white flowers, as also one whose leaves have larger lobes; but as these are generally supposed to be only seminal variations, so I have not enumerated them here.

The second sort is called the Female Peony; the roots of this are composed of several roundish thick knobs or tubers, which hang below each other, fastened with strings; the stalks are green, and rise about the same height as the former; these are garnished with leaves, composed of several unequal lobes, which are variously cut into many segments; they are of a paler green than those of the first, and are hairy on their under side; the flowers are smaller, and of a deeper purple colour. It flowers at the same time as the first.

There are several varieties of this sort with double flowers, which are cultivated in the *English* gardens; these differ in the size and colour of their flowers, but are supposed to have been accidentally obtained from seeds.

The third sort grows naturally in the *Levant*; the roots of this are composed of roundish knobs like those of the second sort, as are also the leaves, but are of a thicker substance; the stalks do not rise so high, the flowers have a greater number of petals. This flowers a little after the other. The large double purple Peony, I suspect is a variety of this sort.

The fourth sort hath roots like the second; the stalks are taller, and of a purplish colour; the leaves are much longer, the lobes are spear-shaped and entire; the flowers are large, and of a deep red colour. This flowers at the same time as the two first sorts.

The seeds of the fifth sort were brought from the *Levant*, and from them there were plants raised, which produced single, and others with double flowers, of the same shape, size, and colour. The roots of these are composed of oblong fleshy tubers or knobs; they are of a pale colour, and hang by strings like the other species. The stalks rise about two feet high, which are of a pale green, and are garnished with leaves composed of several lobes, which are irregular in shape and size, some of them having but six, and others have eight or ten spear-shaped lobes; these are some cut into two, some three segments, and others are entire; they are of a pale green, and are downy on their under side. The stalks are terminated by one flower of a bright red colour, a little less than that of the Female Peony, and has fewer petals; they have a great number of stamina, and sometimes two, at others three germen, like those of the Female Peony, but shorter and whiter. This flowers a little later than the common Peony.

The seeds of the sixth sort were sent to the *Chelsea* garden by Dr. de *Jussieu*, who brought them from *Portugal*, where the plants grow naturally. The root of this sort is not composed of roundish tubers or knobs, but hath two or three long, taper, forked fangs like fingers. The stalk rises little more than a foot high, and is garnished with leaves composed of three or four oval lobes, of a pale colour on their upper side, and hoary on their under; the stalk is terminated by a single flower, which is of a bright red colour, smaller than either of the former, and of an agreeable sweet scent. This flowers about the same time with the common sort.

The first of these sorts is chiefly propagated for the roots, which are used in medicine; for the flowers being single, do not afford near so much pleasure as those with double flowers, nor will they abide near so long in beauty.

All the sorts with double flowers are preserved in curious gardens for the beauty of their flowers, which, when intermixed with other large growing plants in the borders of large gardens, will add to the variety; and the flowers are very ornamental in basons or flower-pots, when placed in rooms.

They are all extremely hardy, and will grow in almost any soil or situation, which renders them more valuable; for they will thrive under the shade of trees, and in such places they will continue much longer in beauty.

They are propagated by parting their roots, which multiply very fast. The best season for transplanting them is toward the latter end of *August*, or the beginning of *September*; for if they are removed after their roots have shot out new fibres, they seldom flower strong the succeeding summer.

In parting of these roots you should always observe to preserve a bud upon the crown of each offset, otherwise they will come to nothing; nor should you divide the roots too small (especially if you have regard to their blowing the following year); for when their offsets are weak, they many times do not flower the succeeding summer, or at least produce but one flower upon each root: but where you would multiply them in quantities, you may divide them as small as you please, provided there be a bud to each offset; but then they should be planted in a nursery-bed for a season or two, to get strength, before they are placed in the flower-garden.

The single sorts may be propagated from seeds (which they generally produce in large quantities, where the flowers are permitted to remain); which should be sown soon after they are ripe upon a bed of light fresh earth, covering them over about half an inch thick with the same light earth. The spring following the plants will come up, when they should be carefully cleared from weeds, and in very dry weather refreshed with water, which will greatly forward their growth. In this bed they should remain two years before they are transplanted, observing in autumn, when the leaves are decayed, to spread some fresh rich earth over the beds about an inch thick, and constantly to keep them clear from weeds.

The *Portugal* Peony may also be propagated either by seeds, or parting of the roots, in the same manner as the other sorts, but should have a lighter soil and a warmer situation. The flowers of this kind are single, but smell very sweet, which renders it worthy of a place in every good garden.

PALIURUS. *Tourn. Inst. R. H.* 616. *tab.* 387. *Christ's Thorn.*

The Characters are,

The flower has no empalement. It hath five petals which are ranged circularly. It hath five stamina, which are inserted in the scales under the petals, terminated by small summits, and a roundish trisid germen, supporting three short styles, crowned by obtuse stigmas. The germen afterward becomes a buckler-shaped nut divided into three cells, each containing one seed.

We know but one Species of this genus, *viz.*

PALIURUS. *Dod. Pempt.* 848. *Christ's Thorn.*

This plant grows naturally in the hedges near *Palestine*; it rises with a pliant shrubby stalk to the height of eight or ten feet, sending out many weak slender branches, garnished with oval leaves placed alternately; they have three longitudinal veins, and are of a pale green. The flowers come out at the wings of the stalk in clusters, almost the length of the young branches; they are of a greenish-yellow colour, and appear in *June*, and are succeeded by broad, roundish, buckler-shaped seed-vessels, which have borders like the brims of a hat, the foot-stalks being fastened to the middle, and have three cells, each containing one seed.

This is by many persons supposed to be the plant from which the crown of thorns, which was put upon the head of our Saviour, was composed; the truth of which is supported by many travellers of credit, who affirm that this is one of the most common shrubs in the country of *Judæa*; and from the pliability of its branches, which may be easily wrought into any figure, it may afford a probability.

This shrub grows wild in most parts of the *Levant*, as also in *Italy*, *Spain*, *Portugal*, and the south of *France*, especially near *Montpelier*, from whence their seeds may be procured, for they do not ripen in *England*. These seeds should be sown as soon as possible, after they arrive, in a bed of light earth, and the plants will come up the following spring; but when the seeds are kept out of the ground till spring, they will not come up till the next year, and very often fail; therefore it is much the best way to sow them in autumn. These seedling plants may be transplanted the following season into a nursery to get strength, before they are planted out for good.

It may also be propagated by laying down its tender branches in the spring of the year, which, if carefully supplied with water in dry weather, will take root in a year's time, and may then be taken off from the old plant, and transplanted where they are to remain.

The best time for transplanting this plant is in autumn, soon after the leaves decay, or the beginning of *April*, just before it begins to shoot, observing to lay some mulch upon the ground about their roots to prevent them from drying, as also to refresh them now and then with a little water until they have taken fresh root; after which they will require but very little care. They are very hardy, and will grow to be ten or twelve feet high, if planted in a dry soil and a warm situation. There is little beauty in this plant, but it is kept in gardens as a curiosity.

PALMA. *Plum. Gen.* 1. The Palm-tree.

The Characters are,

It hath male and female flowers; in some species on the same plant, and in others on different plants; the empalement of the male flowers are divided into three parts. The flowers have three petals, and six stamina terminated by oblong summits, with an obsolete germen, supporting three short styles, crowned by acute stigmas; these are barren. The female flowers have a common sheath, but no empalement; they have six short petals, and an oval germen sitting upon an awl-shaped style, crowned by a trifid stigma. The germen afterward becomes a fruit of various forms and sizes in different species.

The Species are,

1. PALMA *frondibus pinnatis, foliolis angustioribus aculeis terminalibus*. Palm-tree with winged leaves, whose lobes are narrow, and terminated by spines; or Date-tree.

2. PALMA *frondibus pinnatis, foliolis replicatis, spadiceis alaribus, fructu maximo anguloso*. Palm-tree with winged leaves, whose lobes are folded back, foot-stalks proceeding from the sides of the branches, and a large angular fruit; commonly called Cocoa nut.

3. PALMA *frondibus pinnatis, ubique aculeatis, aculeis nigricantibus fructu majore*. Palm-tree with winged leaves, which are every where armed with black spines, bearing a larger fruit; commonly called great Macaw-tree.

4. PALMA *frondibus pinnatis, foliolis replicatis, ramis aculeatis, aculeis sepius geminatis nigricantibus*. Palm-tree with winged leaves, whose lobes are folded back, and prickly branches, whose thorns often come by pairs, and are black.

5. PALMA *frondibus pinnatis, caudice æquali, fructu minore*. Palm-tree with winged leaves, an equal trunk, and a smaller fruit; commonly called the Cabbage-tree.

6. PALMA *frondibus pinnatis, caudice tereti aculeato, fructu minore*. Palm-tree with winged leaves, a taper prickly stalk, and a smaller fruit; called Prickly Pole.

7. PALMA *frondibus pinnatis, foliolis linearibus planis, stipitibus spinosis*. Palm-tree with winged leaves, having narrow plain lobes, and prickly midribs; commonly called oily Palm-tree.

8. PALMA *frondibus pinnato-palmatis plicatis, caudice squamato*. Palm tree with hand-shaped winged leaves, which are plaited, and a scaly stalk; called Palmetto, or Thatch.

9. PALMA *frondibus pinnatis, foliolis linearibus lanceolatis, petiolis spinosis*. *Hort. Cliff.* 482. Palm-tree with winged leaves, whose lobes are linearly spear-shaped, and prickly foot-stalks.

10. PALMA *frondibus pinnatis, foliolis rigidis, alternis, aculeis terminalibus*. Palm-tree with winged branches, whose lobes are rigid, alternate, and terminated by prickles.

11. PALMA *frondibus pinnato-palmatis, foliolis replicatis, inferuè incanis*. Palm-tree with hand shaped winged leaves, whose lobes are folded backward, and are hoary on their under side.

12. PALMA *fructu clavato polyphyreno*. *Trew. Dec. tab.* 7. Palm tree with a club-shaped fruit containing many seeds.

13. PALMA *frondibus pinnatis, foliis lanceolatis plicatis geminatis sparsis*. Palm-tree with winged leaves, whose lobes are spear-shaped, plaited, and come out by pairs from one point, standing thinly along the midrib.

14. PALMA *foliis simplicibus integerrimis flaccidis*. Palm-tree with single, entire, flaccid leaves; commonly called Dragon-tree.

The first sort here mentioned is the common Date-tree, which grows plentifully in *Africa*, and some of the eastern countries, from whence the fruit is brought to *England*. This rises to a great height in the warm countries; the stalks are generally full of rugged knots, which are the vestiges of the decayed leaves, for the trunks of these trees are not solid like other trees, but the center is filled with pith, round which is a tough bark full of strong fibres while young, but as the trees grow old, so this bark hardens and becomes ligneous; to this bark the leaves are closely joined, which in the center rise erect, being closely folded or plaited together; but after they are advanced above the vagina which surrounds them, they expand very wide on every side the stem, and, as the older leaves decay, the stalk advances in height. The leaves of these trees, when grown to a size for bearing fruit, are six or eight feet long; these have narrow long leaves (or pinnæ) set on alternately their whole length. The small leaves or lobes are toward the base three feet long, and little more than one inch broad; they are closely folded together when they first appear, and are wrapped round by brown fibres or threads, which fall off as the leaves advance, making way for them to expand; these never open flat, but are hollow like the keel of a boat, with a sharp ridge on their back-side; they are very stiff, and, when young, of a bright green, ending with a sharp black spine. These trees have male flowers on different plants from those which produce the fruit, and there is a necessity for some of the male trees to grow near the female, to render them fruitful; or, at least, to impregnate the ovary of the seed, without which the stones, which are taken out of the fruit, will not grow. Most of the old authors, who have mentioned these trees, affirm, that unless the female or fruit-bearing Palm-trees have the assistance of the male, they are barren; therefore in such places, where there are no male trees near the female, the inhabitants cut off the bunches of male flowers when they are just opened, and carry them to the female trees, placing them on the branches near the female flowers to impregnate them; which, they all agree, has the desired effect, rendering the trees fruitful, which would otherwise have been barren. *Pere Labat*, in his account of *America*, mentions a single tree of this kind, growing near a convent in the island of *Martinico*, which produced a great quantity of fruit, which came to maturity enough for eating; but, as there was no other tree of this kind in the island, they were desirous to propagate it, and accordingly planted great numbers of the stones for several years, but not one of them grew; therefore after having made several trials without success, they were obliged to send to *Africa*, where

where these plants grew in plenty, for some of the fruit; the stones of which they planted, and raised many of the plants. He then conjectures, that the single tree before-mentioned, might be probably so far impregnated by some neighbouring Palm-trees of other species, as to render it capable of ripening the fruit, but not sufficient to make the seeds prolific, as is the case when animals of different kinds copulate.

The flowers of both sexes come out in very long bunches from the trunk between the leaves, and are covered with a spathe, (or sheath) which opens and withers; those of the male have six short stamina, with narrow four-cornered summits filled with farina. The female flowers have no stamina, but have a roundish germen, which afterward becomes an oval berry, with a thick pulp inclosing a hard oblong stone, with a deep furrow running longitudinally. The bunches of fruit are sometimes very large.

This species of Palm is by Dr. *Linnaeus* titled *Phoenix*, which is the *Greek* name of it, and he makes it a distinct genus. There are some varieties, if not different species of this tree, in the warm countries, but as we cannot expect to see the trees in perfection in our country, it is not likely we shall come to any certainty how they differ from each other.

These plants may be easily produced from the seeds taken out of the fruit, (provided they are fresh) which should be sown in pots filled with light rich earth, and plunged into a moderate hot-bed of tanners bark, which should be kept in a moderate temperature of heat, and the earth frequently refreshed with water.

When the plants are come up, they should be each planted into a separate small pot filled with the same light earth, and plunged into a hot-bed again, observing to refresh them with water, as also to let them have air in proportion to the warmth of the season, and the bed in which they are placed. During the summer time they should remain in the same hot-bed, but in the beginning of *August* you should let them have a great share of air to harden them against the approach of winter; for if they are too much forced, they will be so tender as not to be preserved through the winter without much difficulty, especially if you have not the conveniency of a bark-stove to keep them in.

The beginning of *October* you must remove the plants into the stove, placing them where they may have a moderate share of heat (these being somewhat tenderer, while young, than after they have acquired some strength); though indeed they may be sometimes preserved alive in a cooler situation, yet their progress would be so much retarded, as not to recover their vigour the succeeding summer. Nor is it worth the trouble of raising these plants from seeds, where a person has not the conveniency of a stove to forward their growth, for where this is wanting, they will not grow to any tolerable size in twenty years.

Whenever these plants are removed, (which should be done once a year) you must be very careful not to cut or injure their large roots, which is very hurtful to them; but you should clear off all the small fibres which are inclinable to mouldiness, for if these are left on, they will in time decay, and hinder the fresh fibres from coming out, which will greatly retard the growth of the plants.

The soil in which these plants should be placed, must be composed in the following manner, *viz.* half of light fresh earth taken from a pasture ground, the other half sea sand, and rotten dung or tanners bark in equal proportion; these should be carefully mixed, and laid in a heap three or four months at least before it is used, but should be often turned over, to prevent the growth of weeds, and to sweeten the earth.

You should also observe to allow them pots proportion-

able to the sizes of the plants, but you must never let them be too large, which is of worse consequence than if they are too small. During the summer season they should be frequently refreshed with water; but you must be careful not to give it in too great quantities, but in winter they will require very little.

These plants are very slow growers, even in their native countries, notwithstanding they arrive to a great magnitude; for it has been often observed by several of the old inhabitants of those countries, that the plants of some of these kinds have not advanced two feet in height in ten years; so that when they are brought into these countries, it cannot be expected they should advance very fast, especially where there is not due care taken to preserve them warm in winter; but however slow of growth these plants are in their native countries, yet they may be with us greatly forwarded, by placing the pots into a hot-bed of tanners bark, which should be renewed as often as is necessary, and the plants always preserved therein both winter and summer; observing to shift them into larger pots as they advance in growth, as also to supply them with water properly. There are plants now in the *Chelsea* garden, whose leaves are seven feet long, which were raised from seeds more than twenty years ago, and their stems are not two feet high; one of which has produced some small bunches of male flowers.

The second sort here mentioned, is the Cocoa nut, whose fruit are frequently brought to *England*, some of which are of a large size. The branches of this tree are winged like those of the former, but the small leaves or lobes are three times as broad; they open flat, their borders fold backward, and are of a lighter green than those of the first sort. The whole leaf (or branch) is often twelve or fourteen feet long; the male flowers grow in different parts of the same tree with the fruit, proceeding from the trunk between the leaves; they are disposed in long bunches, as are also the females; the nuts growing in very large clusters, which are covered with a thick fibrous coat adhering closely to them. The nuts are large, oval, and have three holes in the shell at the top; the kernel is firm, white within, and the shell contains a quantity of pale juice, which is called the milk.

The Cocoa nut is cultivated in most of the inhabited parts of the *East* and *West-Indies*, but is supposed a native of the *Maldives*, and the desert islands of the *East-Indies*; from whence it is supposed it hath been transported to all the warm parts of *America*, for it is not found in any of the inland parts, nor any where far distant from settlements. It is one of the most useful trees to the inhabitants of *America*, who have many of the common necessaries of life from it. The bark of the nut is made into cordage, the shell of the nut into drinking bowls, the kernel of the nut affords them a wholesome food, and the milk contained in the shell, a cooling liquor. The leaves of the trees are used for thatching their houses, and are also wrought into baskets, and most other things which are made of osiers in *Europe*.

This tree is propagated by planting of the nuts, which in six weeks or two months after planting will come up, provided they are fresh, and thoroughly ripe, which is what few of them are, which are brought to *England*; for they always gather them before they are ripe, that they may keep during their passage; so that the best way to bring nuts into *England* for planting, would be to take such of them as are fully ripe, and put them up in dry sand in a tub, where the vermin may not come to them; and these will often sprout in their passage, which will be an advantage, because then they may be immediately planted into pots of earth, and plunged into the bark-bed.

The third sort is commonly called Macaw-tree by the inhabitants of the *British* islands in *America*. This rises to the height of thirty or forty feet. The stem is generally larger toward

toward the top than at bottom; the branches (or rather the leaves) are winged; the small leaves or lobes are long and broad; the stalk and leaves are strongly armed with black spines of various sizes in every part; the male and female flowers are on the same tree, coming out in the same manner as the Cocoa nut. The fruit is about the size of a middling Apple, and is inclosed in a hard shell.

The Macaw-tree is very common in the *Caribbee Islands*, where the negroes pierce the tender fruit, from whence flows out a pleasant liquor, of which they are very fond; and the body of the tree affords a solid timber, with which they make javelins, arrows, &c. and is by some supposed to be a sort of ebony. This tree grows very slow, and requires to be kept warm in winter.

The fourth sort grows naturally at *La Vera Cruz*. This hath winged leaves or branches like the other sorts. The small leaves or lobes are as narrow as those of the first sort, but are not quite so stiff; they spread open, are flat, and their edges fold backward; their ends are blunt, and have no spines; the midrib is armed with long black spines, which frequently come out by pairs from the same point. The flowers come out from between the leaves, and the fruit grows on the same plant as the male flowers, which are about the same size and shape as those of the former sort; but, as the lobes of the leaves are much narrower, and have no spines on their surface, there can be no doubt of its being a distinct species.

The fifth sort is commonly called Cabbage-tree in the *West-Indies*. This rises to a very great height in the countries where it grows naturally. *Ligon*, in his history of *Barbadoes*, says, there were then some of the trees growing there, which were more than two hundred feet high; and that he was informed they were a hundred years growing to maturity, so as to produce seeds. The stalks of these trees are seldom larger than a man's thigh; they are smoother than those of most other sorts, for the leaves naturally fall off entire from them, and only leave the vestige or marks where they have grown. These leaves (or branches) are twelve or fourteen feet long; the small leaves or lobes are about a foot long, and half an inch broad, with several longitudinal plaits or furrows ending in soft acute points; these are not so stiff as those of the first sort, and are placed alternately. The flowers come out in long loose bunches below the leaves; these branch out into many loose strings, and are near four feet long, upon which the flowers are thinly placed. The female flowers are succeeded by fruit about the size of a Hazel nut, having a yellowish skin, fitting close to the strings of the principal foot-stalk.

As the inner leaves of this encompass the future buds more remarkably than most of the other species, so it is distinguished by this appellation of Cabbage-tree; for the center shoots, before they are exposed to the air, are white and very tender, like most other plants which are blanched; and this is the part which is cut out and eaten by the inhabitants, and is frequently pickled and sent to *England* by the title of Cabbage; but whenever these shoots are cut out, the plants decay, and never after thrive; so that it destroys the plants, which is the reason that few of the trees are now to be found in any of the islands near settlements, and those are left for ornament.

The sixth sort is commonly called Prickley Pole in *Jamaica*, where it naturally grows. These trees are commonly found in thicket, where a great number of them are close together. Their stalks are slender, seldom more than five or six inches diameter, but rise to the height of forty feet, and are closely armed with long thorns. The leaves are placed circularly on the top, (as in most of the other species). These are winged, but the lobes are shorter and greener

than those of the other sorts, and are closely armed with thorns. The flowers come out in the same manner as those of the Cocoa nut, upon long branching foot-stalks; they are larger than the largest gray Peas, flattened at the top, and are covered with a red skin. The inhabitants of *Jamaica* make rammers and rods for scowering of guns, of the stems of these trees, which are very tough and pliable; but there is no use made of any other part, so far as I can learn.

The seventh sort is called in the *West-Indies* the Oily Palm, and by some Negroes Oil, for the fruit of this tree was first carried from *Africa* to *America* by the negroes. It grows in great plenty on the coast of *Guinea*, and also in the *Cape de Verd Islands*, but was not in any of our *American* colonies till it was carried there; but now the trees are in plenty in most of the islands, where the negroes are careful to propagate them.

The leaves of this tree are winged; the small leaves or lobes are long, narrow, and not so stiff as most of the other sorts; the foot-stalks of the leaves are broad at their base, where they embrace the stem, diminishing gradually upward, and are armed with strong, blunt, yellowish thorns, which are largest at their base. The flowers come out at the top of the stem between the leaves; some bunches have only male flowers, others have female; the latter are succeeded by oval berries, bigger than those of the largest *Spanish Olives*, but of the same shape; these grow in very large bunches, and when ripe are of a yellowish colour.

From the fruit the inhabitants draw an oil, in the same way as the oil is drawn from Olives; from the body of the tree they extract a liquor, which, when fermented, has a vinous quality, and will inebriate. The leaves of the tree are wrought into mats by the negroes, on which they lie.

The eighth sort is called Palmetto-tree, or Thatch, by the inhabitants of *Jamaica*, where this tree grows upon all the Honey-comb rocks in great plenty. It rises with a slender stalk ten or twelve feet high, which is naked and smooth, and at top garnished with many fan-shaped leaves placed circularly; these have foot-stalks two or three feet long, which are armed with a few strong, green, crooked spines; the pinnæ, or lobes, do all meet in one center, where they join the foot-stalk, and are joined together a third part of their length from their base; they are at first closely folded into plaits, but afterward spread out like a fan; their ends being pliant do often hang downward, and between these pinnæ hang down long threads. The flowers and fruit come out from between the leaves; the fruit is of the shape and size of the small *Lucca Olives*. The leaves of this tree are used for thatch all over the *West-Indies*.

The ninth sort grows naturally in *Japan*, and also upon rocky dry mountains at *Malabar*. This in time rises with a strait trunk about forty feet high, which has many circles round it the whole length, which are occasioned by the vestige of the leaves, which are placed circularly round the stem; so as these separate entirely and fall off, the circles remain where their base embraced the stalk. The stalks are terminated by an obtuse cone, just below which the leaves are placed; those on the large trees are eight or nine feet long, but those of the small plants are much less; the largest I have seen were not more than two feet long. The base of the foot-stalk, which partly embraces the trunk, is broad and three-cornered, and is armed on each side with short spines to the place where the lobes, or small leaves, begin. These pinnæ or lobes are long, narrow, and entire, of a lucid green on their upper side, standing by pairs along the midrib very close together. The flowers and fruit are produced in large bunches at the foot-stalks of the leaves; the fruit is oval, about the size of a large Plum, and nearly of the same shape; the skin or covering changes first yellow, and

and afterward red when ripe; of a sweet taste, under which is a hard brown shell, inclosing a white nut, which is in taste like the Chestnut.

From the pith of the trunk of this tree is made the sago; this is first pulverized, then it is made into a paste, and afterward granulated.

The tenth sort grows naturally at *St. Helena*, from whence the plants were brought to *England*. The leaves of this on the plants now in *England* are ten feet long, the midrib or foot-stalk is broad, and flat on the under side, but rises with a sharp ridge on the upper; the small leaves or lobes are ranged alternately on the sides, which are also broad; these are from two feet and a half to nine or ten inches long, the longest being at bottom, decreasing gradually to the top; they are stiff, and fold inward, of a dark green, ending in a sharp thorn. One of these plants has for some years produced bunches of male flowers between the leaves; but we are at present ignorant what the fruit is which these trees produce, but as the leaves are very different from all the sorts of Palms here known, I make no doubt of its being a distinct species.

The eleventh sort was discovered by the late Mr *Robert Millar*, growing naturally on the mountains near *Panama*, where the *Spaniards* call it Mountain Cabbage. The fruit of this tree, which was sent to *England* by the gentleman before-mentioned, were of the size and shape of middling Plumbs, covered with a thick shell; from these several plants were raised in the *English* gardens, which have made no great progress as yet. The leaves stand upon pretty long foot-stalks, which are broad at the top, and have a sharp ridge or angle underneath. The lobes or pinnæ are placed circularly, meeting in a point at their base, where they join the foot-stalk; they are divided to the bottom, and are two feet long, three inches broad in the middle, and fold backward; they are of a deep green on their upper side, and of a russet colour on their under side at first, but afterward become white. These are not so stiff as those of most other sorts, nor do they end in spines.

The twelfth sort was discovered by the late Dr. *Houssoun*, growing naturally in the sands near *Old Vera Cruz* in *America*. This hath a thick stem, which seldom rises more than two feet high. The leaves come out round the upper part of the stem, standing upon foot-stalks which are a foot and a half long; they are winged; the lobes or small leaves are about five inches long, and one and a half broad in the middle, drawing to a point at both ends; they are stiff, smooth, and entire, having a few small indentures at their points, and are placed alternate, of a pale green colour; there are fourteen or fifteen of these lobes ranged along the midrib or stalk. The fruit rises up from the side of the stem, upon a short thick foot-stalk, standing upright, and shaped like a club, having many red seeds about the size of large Peas, standing in separate cells round the central foot-stalk, to which they adhere. These plants have their male flowers on separate plants from the fruit, for all those plants which have flowered in *England* are of the male kind. The plants lose their leaves before the fruit is ripe annually. The first time when Dr. *Houssoun* saw these plants growing at *La Vera Cruz*, they were in full leaf, but on his return to the same place three months after, the fruit was then ripe, and all the leaves were fallen off; and this he afterwards observed the following season.

The thirteenth sort was discovered by the late Dr. *Houssoun* in the *Spanish West-Indies*. This rises with a very tall naked trunk, garnished at the top with long winged branches or leaves, whose lobes are spear-shaped and plaited; they are of a softer texture than any of the other sorts, and for the most part come out two from the same point, so stand by pairs on the same side of the midrib; they have two lobes

on a side a little above each other, but there is a great space between every four lobes. The flowers come out in long bunches from between the leaves, the male flowers hanging on long slender strings; but the fruit, which is about the size of a middling Plumb, is collected into large bunches.

The fourteenth sort grows naturally in the *Cape de Verd Islands*, from whence I had one of the plants brought me; as also in the *Madeiras*, from whence I have received the seeds. This is called Dragon-tree, because the inspissated juice of the plants becomes a red powder very like the eastern dragons-blood, and is frequently used instead of it in the shops; but the tree, from whence the true dragons-blood is taken, is of a very different genus from this. Dr. *Van Royen*, in the *Prodromus* of the *Leyden* garden, has ranged this among the *Yuccas*, I suppose, from the similitude of the plant to those of that genus; for, as the fruit of this is a berry not unlike those of the Bay-tree, and the seeds of the *Yucca* grow in capsules with three cells, they cannot be of the same genus; nor have we any account of the real characters of this plant, so as absolutely to determine the genus; therefore, as it has by several modern authors been ranged in this genus, I have continued it there. This rises with a thick trunk nearly equal in size the whole length, the inner part of which is pithy; next to this is a circle of strong fibres, and the outside is soft. The stalk or trunk rises twelve or fourteen feet high; there are the circular marks or rings left the whole length, where the leaves are fallen off; for as these half embrace the stalk with their base, so when they fall away, the vestigia where they grew remain. The top of the stalk sustains a large head of leaves, which come out singly all round it; they are shaped like those of the common Iris, but are much longer, being often four or five feet long, and an inch and a half broad at their base, where they embrace the stalk, and lessen gradually to the end, where they terminate in a point. These leaves are pliable, and hang down all round the stem; they are entire, and of a deep green, smooth on both surfaces, and greatly resemble those of the common yellow Iris. As this plant has not flowered in *England*, I can give no account of its flowers; but so far as I can judge from the berries which I have received, it may properly enough be ranged in this genus.

All these sorts of Palms are propagated by seeds, which should be sown in the same way as hath been directed for the first sort, and the plants should afterward be treated in the same manner, with this difference, that such of them as are natives of very warm countries, will require to be kept in a warmer air. The second, third, fourth, fifth, seventh, eighth, twelfth, and thirteenth sorts, should be constantly kept in the bark-bed in the stove, otherwise they will not make great progress in *England*; and when they do thrive, they grow in about twenty years too tall for most of the stoves which are at present built here, nor can we hope to see many of them produce their fruit in *England*; for the plants are preserved by the curious for their foliage, which being so singular and different from that of the *European* trees, renders them worthy of care.

The other sorts may be kept in a dry stove in winter in a moderate temperature of air, and in the heat of summer they may be exposed to the open air in a warm sheltered situation for about three months; but they should be removed into the stove, before the morning frosts come on in the autumn. When these plants are kept in a moderate degree of warmth, they should have but little water during the winter season; and in the summer, when they are exposed in the open air, they must not be often watered, unless the season is remarkably dry and warm, for too much moisture will soon destroy them. The other management of them is nearly the same as for the Date Palms, which is

not to cut their principal roots when they are shifted from one pot to another, nor to confine their roots too much; but as the plants grow in size, they should annually be removed into pots a size larger than those they were in the former year. The earth in which they are planted, should be light, so as to let the moisture easily pass off; for if it is strong, and detains the moisture, the tender fibres of the roots will rot.

PANAX *Lin. Gen. Plant.* 1031. Ginseng, or Ninseng.

The Characters are,

It hath male and hermaphrodite flowers on distinct plants; the male have simple globular umbels, composed of several coloured rays which are equal. The flower has five narrow, oblong, blunt petals, which are reflexed, sitting on the empalement, and five oblong slender stamina inserted in the empalement, terminated by single summits. The hermaphrodite umbels are simple, equal, and clustered; the involucre is small, permanent, and composed of several awl-shaped leaves. The flowers have five oblong equal petals, which are recurved, and five short stamina terminated by single summits which fall off, with a roundish germen under the empalement supporting two small erect styles, crowned by simple stigmas. The germen afterward becomes an umbellicated berry with two cells, each containing a single, heart-shaped, convex, plain seed.

The Species are,

1. PANAX *foliis ternis quinatis. Flor. Virg.* 147. Panax with trifoliolate Cinquefoil leaves; called Ninzin.

2. PANAX *foliis ternis ternatis. Flor. Virg.* 35. Panax with three trifoliolate leaves.

Both these plants grow naturally in North America; the first is generally believed to be the same as the Tartarian Ginseng, the figures and descriptions of that plant, which have been sent to Europe by the missionaries, agreeing perfectly with the American plant.

This hath a fleshy taper root as large as a man's finger, which is jointed, and frequently divided into two smaller fibres downward. The stalk rises above a foot high, naked to the top, where it generally divides into three smaller foot-stalks, each sustaining a leaf composed of five spear-shaped lobes, which are sawed on their edges; they are of a pale green, and a little hairy. The flowers arise on a slender foot-stalk, just at the division of the foot-stalks, which sustain the leaves, and are formed into a small umbel at the top; they are of an herbaceous yellow colour, composed of five small petals, which are recurved. These appear the beginning of June, and are succeeded by compressed heart-shaped berries, which are first green, but afterward turn red, inclosing two hard, compressed, heart-shaped seeds, which ripen the beginning of August.

The Chinese hold this plant in great esteem, according to the accounts which have been transmitted to Europe by the missionaries. Father Jartoux in his letters says, that the most eminent physicians in China have written whole volumes upon the virtues of this plant, and make it an ingredient in almost all remedies, which they give to their nobility, for it is of too high price for the common people. They affirm that it is a sovereign remedy for all weakness occasioned by excessive fatigues, either of body or mind; that it cures weakness of the lungs and the pleurisy; that it stops vomitings; that it strengthens the stomach, and helps the appetite; that it strengthens the vital spirits, and increases the lymph in the blood; in short, that it is good against dizziness of the head, and dimness of sight, and that it prolongs life in old age.

This father also says, he has made trials of the root of this plant himself, and has in an hour after taken half one of the roots, found himself greatly recovered from weariness and fatigue, and much more vigorous, and could bear labour with greater ease than before.

This plant has been introduced to the English gardens from America, where it has been planted in a shady situation and a light soil, the plants have thriven and produced flowers, and ripened their seeds annually, but none of these seeds have grown; for I have several years sown them soon after they were ripe, without any success; I have also sown of the seeds which were sent me from America several times, in various situations, and have not raised a single plant from either; and by the accounts which the missionaries have sent from China, it appears they have had no better success with the seeds of this plant, which they say they have frequently sown in the gardens in China, but could not raise one plant; so that I believe there is a necessity for the hermaphrodite plants to have some male plants stand near them, to render the seeds prolific; for all those plants which I have seen, or saved the seeds from, were such as had hermaphrodite flowers; and though the seeds seem to ripen perfectly, yet their not growing, though I have waited three years, without disturbing of the ground, confirms me in this opinion.

The second sort grows naturally in the same countries, but whether it is possessed of the same qualities as the first I cannot say; I have seen but one plant of this sort in England, which was sent me a few years ago from Maryland, and did not live over the first summer, which was remarkably dry, and being planted in a dry soil, was the occasion of its death; the stalk of this was single, and did not rise more than four inches high, dividing into three foot-stalks, each sustaining a trifoliolate leaf, whose lobes were longer, narrower, and deeper indented on the edges, than those of the former. The flower-stalk rose from the divisions of the foot-stalk of the leaves, but before the flowers opened, the plant decayed, so I can give no farther account of it.

PANCRATIUM. *Dill. Hort. Elth.* 221. fol. 289. Sea Daffodil.

The Characters are,

The flowers are inclosed in an oblong spathe or sheath, and have a funnel-shaped, cylindrical nectarium of one leaf, spreading open at the top, with six spear-shaped petals, which are inserted on the outside of the nectarium, and six long stamina inserted in the brim of the nectarium, terminated by oblong prostrate summits. They have a three-cornered obtuse germen situated under the flower, supporting a long slender style, crowned by an obtuse stigma. The germen afterward becomes a roundish three-cornered capsule with three cells, filled with globular seeds.

The Species are,

1. PANCRATIUM *spathâ multiflorâ, petalis planis, foliis linguatis. Lin. Sp. Plant.* 291. Pancratium with a sheath containing many flowers, plain petals, and tongue-shaped leaves; the Sea Daffodil.

2. PANCRATIUM *spathâ multiflorâ, foliis ensiformibus, staminibus nectario longioribus. Flor. Leyd. Prod.* 34. Pancratium with many flowers in a sheath, sword-shaped leaves, and stamina longer than the nectarium; Lily Daffodil of Sclavonia.

3. PANCRATIUM *spathâ uniflorâ, petalis reflexis. Flor. Zeyl.* 126. Pancratium with one flower in a sheath, whose petals are reflexed.

4. PANCRATIUM *spathâ biflorâ. Hort. Cliff.* 133. Pancratium with two flowers in a sheath.

5. PANCRATIUM *spathâ multiflorâ, foliis ovatis nervosis. Lin. Sp. Plant.* 291. Pancratium with many flowers in a sheath, and oval veined leaves.

6. PANCRATIUM *spathâ multiflorâ, foliis linearibus, staminibus nectarii longitudine. Lin. Sp. Plant.* 291. Pancratium with many flowers in a sheath, narrow leaves, and stamina the length of the nectarium.

7. PANCRATIUM *spathâ multiflorâ, foliis carinatis angustioribus.* Pancratium with many flowers in a sheath, and narrow keeled-shaped leaves.

8. *PANCRATIUM spathâ multiflorâ, foliis carinatis latioribus.* Pancratium with many flowers in a sheath, and broader keel-shaped leaves.

9. *PANCRATIUM foliis ovatis, nervosis, spathâ multiflorâ, staminibus nectario longioribus.* Pancratium with oval veined leaves, and many flowers in a sheath, whose stamina are longer than the nectarium.

The first sort grows naturally on the sea-coast in *Spain*, and the south of *France*. This hath a large, coated, bulbous root, of an oblong form, covered with a dark skin; the leaves are shaped like a tongue, they are more than a foot long, and one inch broad, of a deep green, six or seven of them rising together from the same root, encompassed at bottom with a vagina or sheath; between these arise the stalk, which is a foot and a half long, naked, sustaining at the top six or eight white flowers, inclosed in a sheath, which withers and opens on the side, to make way for the flowers to come out. The germen are situated close to the top of the stalk, from these arise the tube of the flowers, which are three inches long; they are very narrow, swelling at the top, where the cup or nectarium is situated, on the outside of which is fastened the six segments or petals of the flower; these are narrow, and extend a great length beyond the nectarium; from the border of the nectarium arise six long slender stamina, terminated by oblong summits which are prostrate, and in the center arises a style the length of the stamina, terminated by an obtuse stigma. The flowers of this sort do not appear in *England* till the latter end of *August*, so are not succeeded by seeds here. The leaves of this sort are green all the winter, and decay in the spring, so the roots should be transplanted in *June*, after the leaves are decayed. This must be planted in a very warm border, and screened from severe frost, otherwise it will not live through the winter in *England*.

The second sort grows naturally in *Sclavonia*, and also in *Sicily*; this hath a large, coated, bulbous root, covered with a dark skin, sending out many thick strong fibres, which strike deep in the ground; the leaves are sword-shaped, a foot and a half long and two inches broad, of a grayish colour. The stalks are thick, succulent, and rise near two feet high, sustaining at the top six or seven white flowers shaped like those of the first sort, but the tube is shorter and the stamina are much longer. This flowers in *June*, and frequently produces seeds which ripen in *September*.

This sort is hardy, and will live through the winter in the full ground, being never injured but in very severe winters; and if, in such seasons, the surface of the ground is covered with tanners-bark, sea-coal ashes, straw or Peas haulin, to keep out the frost, there will be no danger of the roots suffering. It is propagated either by offsets from the roots, or from seeds; the former is the more expeditious method, for the offsets will flower very strong the second year; whereas those which are raised from seeds, seldom flower in less than four or five years.

The roots of this plant should not be removed oftener than every third year, if they are expected to flower strong; the best time to transplant them is in the beginning of *October*, soon after their leaves decay; they should not be kept long out of the ground, for as they do not lose their fibres every year, so if these are dried by long keeping out of the ground, it greatly weakens the roots. This loves a light sandy soil and a sheltered situation; the roots should be planted nine inches or a foot asunder every way, and five inches deep in the ground.

If the plants are propagated by seeds, they should be sown in pots filled with light earth soon after they are ripe; these pots should be placed under a hot-bed frame in winter, to screen them from frost, but the glasses must be taken off

every day in mild weather. The other management being the same as for the *Narcissus*, I need not repeat it here, so shall only mention, that the young roots will require a little protection in winter, till they have obtained strength.

The third sort grows naturally in *Ceylon*; this hath a pretty large bulbous root, the leaves are long and narrow, of a grayish colour, and pretty thick, standing upright; the stalk rises between them a foot and a half high, naked, sustaining one flower at the top, whose petals are reflexed backward; the nectarium is large, and cut at the brim into many acute segments; the stamina are long, and turn toward each other at their points, in which it differs from the other species. The flower has a very agreeable scent, but is of short duration; this is very rare in the gardens at present.

The fourth sort grows naturally at *La Vera Cruz*, from whence the late Dr. *Houfston* brought some of the roots. The leaves of this sort are about a foot long, and almost two broad, having three longitudinal furrows. The stalk rises about a foot high, then divides like a fork into two small foot-stalks, or rather tubes, which are narrow, green, and at first are encompassed by a thin spatha (or sheath) which withers and opens to give way to the flowers, which are white, and shaped like those of the other species, but have no scent.

The fifth sort was some years past in the *English* gardens, but I believe is now lost here; it grows naturally at *Amboyna*. The root of this sort is oblong, white, and sends out several thick fleshy fibres, which strike downward; the leaves stand upon very long foot-stalks, some of them are oval, and others heart-shaped, about five inches long, and almost as many broad, ending in points, having many deep longitudinal furrows; they are of a light green, and their borders turn inward. The stalk is thick, round, and succulent, rising near two feet high, sustaining at the top several white flowers, shaped like the other species, but the petals are broader; the tube is shorter, and the stamina are not so long as the petals. These flowers have a thin sheath or covering, which splits open longitudinally, to make way for the flowers.

The sixth sort grows naturally on moist boggy soils in *Georgia*, where Mr. *Catesby* discovered it. This hath a roundish bulbous root, covered with a light brown skin, from which arise several narrow dark green leaves, about a foot long; between these come out a thick stalk about nine inches high, sustaining six or seven white flowers, with very narrow petals, having large bell-shaped nectariums or cups, which are deeply indented on their brims; the stamina do not rise far above the nectarium, and are terminated by yellow summits.

The seventh sort grows naturally in the islands of the *West-Indies*, where it is called *White Lily*. This hath a pretty large bulbous root, a little flatted at the top, covered with a brown skin; the leaves are near a foot and a half long, a little more than one inch broad, of a dark green, and hollowed in the middle like the keel of a boat. The stalks rise near two feet high, they are thick, succulent, and naked, sustaining at the top eight or ten white flowers, shaped like those of the first sort, but are of a purer white, and have a strong sweet odour, like that of *Balsam of Peru*. The stamina of this are very long, spreading out wide each way; the pointal is of the same length, standing in the middle of the nectarium. These flowers are of a short duration, seldom continuing longer in beauty than three or four days, and in very hot weather not so long; when these fade, the germen, which are situated at the bottom of the tubes, turn to so many oblong bulbs, which are irregular in form, and, when ripe, drop off in the ground, where they put out fibres and become plants.

These foreign species are most, if not all of them, of this kind, bearing bulbs; whereas the two first have feed-vessels with three cells, inclosing many roundish black seeds, so that though they agree in the characters of flowers, yet in this particular they differ greatly.

The eighth sort grows naturally in the *West-Indies*, where it is not distinguished from the former; but as I have frequently propagated both by their bulbs which succeed the flowers, and have always found the plants so raised continue their difference, so I make no doubt of their being distinct species. This differs from the former, in the leaves being much longer and broader than that; for these are near two feet long, and more than three inches broad, and are hollowed like the keel of a boat. The flowers are larger, the petals longer, and the scent is not so strong as that of the former, and the roots flower in every season of the year. This seems to be the sort figured by Dr. *Trew*, in the twenty-seventh table of his *Decades of Rare Plants*, but if it is, the leaves in his figure are too flat.

The ninth sort grows naturally in the *West-Indies*; this hath a large, roundish, bulbous root, from which arise several oval leaves about a foot long, and six inches broad in the middle, drawing to a point at both ends; they are of a deep green, and have many longitudinal furrows. The stalk is thick, succulent, and naked; it rises a foot and a half high, sustaining at the top six or eight white flowers, of an agreeable sweet scent, shaped like those of the seventh sort, but are smaller; the petals are narrower, the tubes are shorter, and so are the spathæ or sheaths.

These seven sorts last mentioned are tender, so will not thrive in *England*, unless they are placed in a warm stove. The best way to have these plants in perfection, is, to plunge the pots into the bark-bed in the stove, where they will thrive and flower exceeding well; for though they may be preserved in a dry stove, yet those will not thrive so well, nor will their flowers be so strong, as when they are plunged in the tan-bed; nor will they flower oftener than once a year, whereas when they are in the tan-bed, the same roots will often flower two or three times in a year. I have had several of the species in flower at all seasons of the year, so there has not been a month when some of them were not in flower.

They are propagated by offsets from the roots, and also by the bulbs which succeed the flowers; if the latter are planted in small pots filled with light earth from a kitchen-garden, and plunged into a moderate hot-bed, they will soon put out roots and leaves, and with proper management, will become blowing roots in one year, so that they may be easily propagated; and if they are constantly kept in the tan-bed in the stove, they will put out offsets from their roots, and thrive as well as in their native countries.

PANICUM. *Tourn. Inst. R. H.* 515. tab. 298. Panic.

The Characters are,

There is one flower in each chaff; the chaff opens with three valves which are oval, ending in acute points. The petals open with two oval acute-pointed valves. The flowers have three short hair-like stamina, terminated by oblong summits, and a roundish germen, supporting two hair-like styles, crowned by feathered stigmas. The germen afterward becomes a roundish seed, fastened to the withered petals.

The Species are,

1. PANICUM spicâ simplici cernuâ, setis brevioribus, pedunculo hirsuto. Panic with a single nodding spike, short awns, and a hairy foot-stalk; German Panic.

2. PANICUM spicâ compositâ, spiculis glomeratis, setis immixtis, pedunculo hirsuto. *Lin. Sp. Plant.* 56. Panic with a compounded spike, whose smaller spikes grow in clusters intermixed with awns, and have a hairy foot-stalk; Italian Panic.

3. PANICUM spicâ simplici longissimâ, setis bispidis, pedunculo hirsuto. Panic with the longest single spike, prickly awns, and a hairy foot-stalk; Indian Panic with the longest spike.

4. PANICUM spicâ tereti, involuclis bifloris fasciculatopilosis. *Flor. Zeyl.* 44. Panic with a taper spike, having two flowers in each cover, and hairs growing in clusters.

5. PANICUM spicâ simplici æquali, pedunculis bifloris. *Prod. Leyd.* 54. Panic with an equal single spike, and two flowers growing on each foot-stalk.

There are several other species of this genus, than are here enumerated, some of which grow naturally in *England*; but as they are not cultivated, so it would be swelling this work too much, if they were inserted here.

The first sort grows naturally in *Germany* and *Hungary*; of this there are three varieties, one with yellow grain, another with white, and the third has purple grains. This has been formerly cultivated for bread, in some of the northern countries. It rises with a jointed Reed-like stalk about three feet high, and the size of the common Reed, garnished at each joint with one Grass-like leaf a foot and a half long, and an inch broad at the base where broadest, ending in acute points. The stalks are terminated by compact spikes, which are about the thickness of a man's finger at their base, growing taper toward their points, closely set with small roundish grain, like that of Millet. This is an annual plant, which perishes soon after the seeds are ripe.

The second sort is frequently cultivated in *Italy*, and other warm countries. This rises with a Reed-like stalk near four feet high, which is much thicker than that of the former; the leaves are also broader, but of the same shape. The spikes are a foot long, and twice the thickness of those of the former, but not so compact, being composed of several roundish clustered spikes; the grain is also larger, but of the same form.

The third sort grows naturally in both *Indies*; this hath a Reed-like stalk as large as a man's thumb, rising upward of five feet high; the leaves are two inches broad, and more than two feet long, of the same form with those of the former sort; the spikes at the top are a foot and a half long, very compact, and thicker than a man's thumb at the base, growing taper toward the top. The seeds are much larger than those of the other sorts, and are in some white, and others yellow.

The fourth sort grows naturally in both *Indies*; this hath a strong Reed-like stalk, which rises six or seven feet high, garnished with leaves more than three feet long; they are near three inches broad at their base, lessening to a point at the end, having a smooth surface; the spikes arise at the wings of the stalk, they are single, but not so compact as those of the former, having soft awns or beards; they are about six inches long, and stand upon very long foot-stalks; the grain of this is pretty large.

The fifth sort grows naturally in *Peru*; this rises with a Reed-like stalk six feet high, which sends out two or three branches from the sides, and is garnished with long leaves two inches broad at their base; the stalks are of a purple colour, the leaves are also inclining to the same colour. The spikes come out from the wings of the stalks, and at the end of the branches; they are about four or five inches long, thicker than a man's thumb, and almost equal at the point with the base. They are of a pale blue colour, having pretty long awns or beards of the same colour, as are also the seeds, which are larger and rounder than those of the other sorts.

The two first sorts are sown in several parts of *Europe*, in the fields, as Corn, for the sustenance of the inhabitants, but it is reckoned not to afford so good nourishment as Millet; however, it is frequently used in some parts of *Germany* and

and *Italy*, to make cakes and bread, but the *German* is not so much esteemed as the *Italian* sort; but as it will ripen better in cold countries than that, it is generally cultivated where a better sort of grain will not succeed.

The seeds of these sorts may be sown in the spring, at the same time as Barley is sown, and may be managed exactly in the same way; but this should not be sown too thick, for these seeds are very small, and the plants grow stronger, therefore require much more room. The *German* sort doth not grow above three feet high, unless it is sown on very rich land; in which case it will rise to be four feet high, but the leaves and stems of this Corn are very large, so require to stand four or five inches apart, otherwise they will grow up weak, and come to little. These large growing Corns should be sown in drills at about eighteen inches apart, so that the ground may be hoed between the rows of Corn, to keep them clear from weeds, and the stirring of the ground will greatly improve the Corn. In *July* the Corn will ripen, when it may be cut down and dried, and then should be housed.

The *Italian* Panic grows much larger than the *German*, and produces much larger spikes; so this should be allowed more room to grow, otherwise it will come to little. This is also later before it ripens, so it is not very proper for cold countries.

The other sorts are natives of very warm countries, where they are used by the inhabitants to make bread. These grow very large, and require a good summer, otherwise they will not ripen in this country. The seeds of these kinds should be sown the latter end of *March*, or the beginning of *April*, on a bed of light rich earth, in a warm situation. They should be sown in drills about three feet asunder, and when the plants come up, they must be kept clear from weeds, and thinned where they are too close. When the plants are grown pretty tall, they should be supported by stakes, otherwise the winds will break them down; and when the Corn begins to ripen, the birds must be kept from it, otherwise they will soon destroy it. These sorts are preserved in some curious gardens for the sake of variety, but they are not worth cultivating for use in *England*. The two last sorts do not ripen here.

PANSIES. See *Viola Tricolor*.

PAPAVER. *Tourn. Inst. R. H.* 237. tab. 119. Poppy.

The Characters are,

The empalement of the flower is oval, indented, and composed of two almost oval, concave, obtuse leaves, which fall off. The flower has four large roundish petals which spread open, with a great number of hair-like stamens, terminated by oblong, compressed, erect summits. In the center is placed a large roundish germen, having no style, but is crowned by a plain, radiated, target-shaped stigma. The germen afterward becomes a large capsule, crowned by the plain stigma, having one cell, opening in many places at the top under the crown, and is filled with small seeds.

The Species are,

1. PAPAVER capsulis glabris globosis, caule piloso multifloro, foliis pinnatifidis incis. *Lin. Sp. Plant.* 507. Poppy with smooth globular heads, a hairy stalk with many flowers, and wing-pointed cut leaves; or common, red, Field Poppy.

2. PAPAVER capsulis subglobosis torosis hispida, caule folioso multifloro. *Lin. Sp. Plant.* 506. Poppy with globular capsules which are furrowed and prickly, and a leafy stalk, bearing many flowers.

3. PAPAVER capsulis clavatis hispida, caule folioso multifloro. *Lin. Sp. Plant.* 506. Poppy with nail-shaped prickly heads, and a leafy stalk bearing many flowers.

4. PAPAVER capsula hispida, scapo unifloro nudo hispido, foliis bipinnatis. *Lin. Sp. Plant.* 507. Poppy with prickly heads, a naked prickly stalk bearing one flower, and double-winged leaves.

5. PAPAVER capsulis glabris oblongis, caule multifloro laevi, foliis pinnatis incis. *Lin. Sp. Plant.* 508. Poppy with oblong smooth heads, a smooth stalk bearing many flowers, and cut winged leaves; yellow *Welch* Poppy.

6. PAPAVER capsulis hispida, scapo unifloro nudo hispido, foliis simplicibus pinnato sinuatis. *Hort. Upsal.* 136. Poppy with prickly heads, a naked rough stalk having one flower, and single leaves which are wingedly sinuated.

7. PAPAVER capsulis glabris, caulibus unifloris, scabris, foliis pinnatis serratis. *Hort. Upsal.* 136. Poppy with smooth heads, rough leafy stalks having one flower, and sawed winged leaves.

8. PAPAVER calycibus capsulisque glabris, foliis amplexicaulibus incis. *Lin. Sp. Plant.* 508. Poppy with smooth capsules and empalements, and cut leaves embracing the stalks.

9. PAPAVER capsulis ovatis glabris, foliis latioribus amplexicaulibus marginibus inciso-serratis. Poppy with oval smooth heads, and broader leaves embracing the stalks, which are cut on their edges like the teeth of a saw; commonly called *White Poppy*,

The first sort is the common red Poppy, which grows naturally on arable land in most parts of *England*; from the flowers of this sort is drawn a simple water, a tincture, a syrup, and a conserve of these flowers is also made for medicinal use. It is an annual plant; from the roots rise several rough branching stalks a foot and a half high, garnished with hairy leaves five or six inches long, deeply jagged almost to the midrib, those on the lower part of the leaves being the deepest. At the top of each stalk stand the flowers, which have oval hairy empalements, opening with two valves, and soon fall away. The flowers are composed of four large roundish petals, of a beautiful scarlet colour, and soon fall off. These appear in *June*, and are succeeded by oblong smooth heads, crowned by the flat target-shaped stigma, perforated in several places at the top, filled with small purplish coloured seeds.

The second sort grows naturally among the Corn in many parts of *England*; the leaves of this sort are much smaller than those of the first, and cut into much finer segments; the stalks are slender, a little more than a foot high, not so branching as the former. The flowers are not so large, and of a deep red colour, very soon falling away, seldom lasting more than a whole day; these are succeeded by oblong prickly heads, filled with small black seeds. It flowers in *June*.

The third sort grows naturally among Corn in some parts of *England*, but not in so great plenty as either of the former. The leaves of this are finer cut and smaller than those of the first sort, but are not so fine as those of the second; the stalks do not rise so high as either of the former, and seldom have many branches. The flowers are not half so large as either of the former, and are of a copper colour, falling away in a few hours. These appear in *May*, and are succeeded by long, slender, prickly heads which are channelled, filled with small, black, shrivelled seeds.

The fourth sort grows naturally on the *Alps*, among the rocks. The leaves of this are smooth and doubly winged, the segments are finely cut; the stalks rise about a foot high, sustaining one small yellow, or copper colour flower, which is succeeded by roundish prickly heads, filled with small seeds. This flowers about the same time as the former sort.

The fifth sort has a perennial root; it grows naturally in *Wales*, and also in some of the northern counties in *England*. I have found it growing plentifully near *Kirkby Lonsdale*, in *Westmoreland*. *Tournefort* also found this plant upon the *Pyrenean* mountains. The leaves of this sort are winged; the lobes are deeply cut on their edges. The stalks rise at

foot high; they are smooth, and garnished with a few small leaves, of the same shape as the lower. The upper part of the stalk is naked, sustaining one large yellow flower. These appear in *June*, and are succeeded by oblong smooth capsules, filled with small purplish seeds.

The sixth sort grows naturally on the confines of *Russia* near *Tartary*. The leaves of this sort are single, and sinuated almost to the midrib in form of a winged leaf; they are rough and hairy. The stalk rises near two feet high; it is slender, naked, sustaining one flower at the top, which is composed of four roundish petals of a pale yellow colour, each having a dark bottom or tail. The flowers have an agreeable scent, but are of a short duration. They come out in *June*, but are succeeded by long rough capsules, filled with small seeds.

The seventh sort grows naturally in *Armenia*. The root of this plant is composed of two or three strong fibres as thick as a man's little finger, which are a foot and a half long, of a dark brown on their outside, and full of a milky juice, which is very bitter and acrid. The leaves are winged, and sawed on their edges; they are a foot long, closely covered with bristly white hairs. The stalks rise two feet and a half high; they are very rough and hairy, garnished below with leaves like those at bottom, but smaller; the upper part is naked, sustaining at the top one very large flower, of the same colour with the common red Poppy. These appear in *May*, and are succeeded by oval smooth capsules, filled by purplish seeds.

The eighth sort is the common black Poppy, the seeds of which are sold in the shops by the title of Maw-seed. The sort with single flowers grows in the warm parts of *Europe* naturally; this is annual; the stalks rise three feet high; they are smooth, and divide into several branches, garnished with large leaves, which are smooth, and deeply cut or jagged on their edges, embracing the stalks with their base. The flowers grow on the top of the stalks; they are composed of four large roundish petals, of a purplish colour, with dark bottoms, and are succeeded by oval smooth capsules, filled with black seeds. It flowers in *June*, and the seeds ripen the latter end of *August*.

There are great varieties in the flowers of this sort, some having very large double flowers, which are variegated of several colours, some are red and white, others purple and white, and some are finely spotted like Carnations; so that during their short continuance in flower, there are few plants whose flowers appear so beautiful, but having an offensive scent, and being of short duration, they are not much regarded.

The ninth sort is the common white Poppy. This is cultivated in gardens for the heads, which are used in medicine. The stalks of this are large, smooth, and rise to the height of five or six feet; they branch out into several smaller branches, and are garnished with large grayish leaves, whose base embraces the stalks; they are jagged irregularly on their sides. The flowers terminate the stalks; these, when inclosed in the empalement, nod downward, but before the flowers open they are erect. The empalement of the flower is composed of two large oval leaves, of the same grayish colour as the other; these separate and soon drop off. The flower is composed of four large, roundish, white petals, which are of short duration, and are succeeded by large roundish heads, as big as Oranges, flattened at both ends, having indented crowns, and are filled with small white seeds. This flowers in *June*, and the seeds ripen in *August*.

There are several varieties of this sort, which differ in the colour of their flowers and multiplicity of petals; those with beautiful flowers are preserved in gardens for ornament, but that with the single flowers only is cultivated for

use. The seeds of this sort are used in emulsions, being cooling and good in fevers, and inflammatory distempers, as also for the strangury and heat of urine. Of the dry heads infused and boiled in wine, is made the *Diocodium* of the shops.

All the sorts of Poppy are propagated by seeds, but the fifth and seventh sorts, which have perennial roots, may also be propagated by offsets. The best time for sowing of the seeds is in *September*, when they will more certainly grow than those which are sown in the spring; and those sorts which are annual will make larger plants, and flower better than when they are sown in the spring. The best way is to sow the seeds of the annual kinds in the places where they are to remain, and to thin the plants where they are too close; those of the large kinds should not be left nearer to each other than a foot and a half, and the smaller sorts may be allowed about half that space. The culture they will require after this, is only to keep them clean from weeds.

Those who are curious to have fine Poppies in their gardens, carefully look over their plants when they begin to flower, and cut up all those plants whose flowers are not very double and well marked, before they open their flowers, to prevent their farina mixing with their finer flowers, which would degenerate them; and it is the not being careful of this, that causes the flowers to degenerate so frequently in many places, which is often supposed to be occasioned by the ground.

The yellow *Welsh* Poppy requires a cool shady situation, where the plants will thrive, and produce plenty of seeds annually. If the seeds are permitted to scatter, the plants will come up better than when sown by hand; but if they are sown, it should be always in the autumn, for the seeds of this, which are sown in the spring, rarely succeed.

The best time to transplant, and part the roots of this sort, is in the autumn, that the plants may be well established in their new quarters, before the dry weather comes on in the spring.

The eastern Poppy will thrive either in sun or shade, for I have several of these plants growing under trees, where they have thriven many years, and flower full as well as those in an open situation, but came later in the season. This will propagate very fast by its roots, so there is no necessity for sowing of the seeds, unless to procure new varieties. This sort should be transplanted at the same season as the former, and if the seeds are sown, it should be at the same time for the reasons before given.

PAPAVER CORNICULATUM. See *Glaucium*.

PAPAVER SPINOSUM. See *Argemone*.

PAPAYA. See *Carica*.

PARIETARIA. *Tourn. Inst. R. H. 509. tab. 289.* Pellitory.

The Characters are,

It hath hermaphrodite and female flowers upon the same plant. There are two hermaphrodite flowers contained in a six-leaved involucre. They have no petals, but four permanent awl-shaped stamina, with an oval germen supporting a slender coloured style, crowned by a pencil-shaped stigma. The germen afterward turns to an oval seed wrapped up in the empalement. The female flowers have no stamina, but in other respects are the same as the hermaphrodite.

The Species are,

1. *PARIETARIA foliis lanceolatis alternis.* Pellitory with spear-shaped leaves placed alternately; the officinal Pellitory.

2. *PARIETARIA foliis ovatis alternis.* Pellitory with oval leaves placed alternately; Pellitory with a Basil leaf.

The first sort grows naturally in *Germany* and *Holland*, but was not in *England* till the year 1727, when I brought

it here. This is supposed to be the true sort, which is recommended by the ancients to be used in medicine; it hath a thick perennial root, composed of fleshy reddish fibres, from which arise many stalks a foot and a half high, garnished with hairy spear-shaped leaves. The flowers come out in small clusters on the side of the stalks; they are small, of an herbaceous colour, so make no figure. These appear in succession all the summer months, and the seeds ripen accordingly, which are cast out to a distance with an elasticity when ripe.

The second sort grows plentifully on old walls, and the sides of dry banks in many parts of *England*. This differs from the former in having shorter stalks, and smaller oval leaves. The flowers are also less, and are in smaller clusters; in other respects they are the same.

They may be propagated in plenty from a single plant, which, if permitted to scatter its seeds, will fill the ground about it with young plants, for the seeds are very difficult to collect, as they are thrown out of their covers as soon as they are ripe.

PARIS. *Lin. Gen. Plant.* 449. True-love, or One-berry.

The Characters are,

The empalement of the flower is composed of four leaves, which expand in form of a cross. The flower also hath four leaves, which spread open in the same manner. In the center of the flower is situated a roundish four-cornered germen, supporting four spreading styles, crowned by single summits. This is attended by eight stamina, each having an oblong summit fastened by threads on each side to the stamina. The germen afterward changes to a roundish berry, having four cells, which are filled with seeds.

We know but one Species of this genus, viz.

PARIS *foliis quaternis. Flor. Lapp.* 155. Herb Paris, True-love, or One-berry.

This plant grows wild in moist shady woods in divers parts of *England*, but especially in the northern counties; and it is with great difficulty preserved in gardens. The only method to procure it, is to take up the plants from the places where they grow wild, preserving good balls of earth to their roots, and plant them in a shady moist border, where they may remain undisturbed, in which situation they will live some years; but as it is a plant of little beauty, it is rarely preserved in gardens.

PARKINSONIA. *Plum. Nov. Gen.* 25. tab. 3:

The Characters are,

The empalement of the flower is of one leaf, indented in five parts at the top. The flower has five equal petals placed circularly; the four upper are oval, the under is kidney-shaped. It has ten declining stamina terminated by oblong summits, and a long taper germen with scarce any style, crowned by an obtuse stigma. The germen afterward becomes a long taper pod with swelling joints, in each of which is lodged one oblong seed.

We know but one Species of this plant, which is

PARKINSONIA *aculeata, foliis minutis, uni costæ adnexis. Plum. Nov. Gen.* 25. Prickly Parkinsonia with very small leaves, which are fastened to one middle rib.

This plant was discovered by father Plumier in *America*, who gave it this name in honour of Mr. John Parkinson, who published an universal history of plants in *English*, in the year 1640.

It is very common in the *Spanish West-Indies*, but of late years it has been introduced into the *English* settlements in *America* for the beauty and sweetness of its flowers. This, in the countries where it grows naturally, rises to be a tree of twenty feet high or more, and bears long slender bunches of yellow flowers, which hang down after the same manner as the Laburnum. These flowers have a most agreeable sweet scent, so as to perfume the air to a considerable distance round about the trees; for which reason, the inhabitants of the *West-Indies* plant them near their habitations.

And though this plant has not been introduced many years into the *English* settlements, yet it is now become so common in all the islands, that but few houses are without some of the trees near it; for it produces flowers and seeds in plenty in about two years from seed, so that it may soon be made common in all hot countries; but in *Europe* it requires a stove, otherwise it will not live through the winter.

This plant is propagated by seeds; which should be sown in small pots filled with light fresh earth early in the spring, and the pots must be plunged into a hot-bed of tanners bark, where, in about three weeks or a month's time, the plants will come up, when they should be kept clear from weeds, and frequently refreshed with water. In a little time these plants will be fit to transplant, which should be done very carefully, so as not to injure their roots. They must be each planted into a separate halfpenny pot filled with light fresh earth, and then plunged into the hot-bed again, observing to stir up the tan; and if it hath lost its heat, there should be some fresh tan added, to renew it again. Then shade the plants from the heat of the sun, until they have taken new root; after which time they should have fresh air admitted to them every day, in proportion to the warmth of the season. With this management the plants will grow so fast, as to fill the pots with their roots by the beginning of *July*, at which time they should be shifted into pots a little larger than the former; and plunged again into the bark-bed to forward their taking new root; after which it will be the best way to inure the plants by degrees to bear the open air, that they may be hardened before winter; for if they are kept too warm in winter, the plants will decay before the next spring. The only method by which I have succeeded in keeping this plant through the winter, was by hardening them in *July* and *August* to bear the open air; and in *September* I placed them on shelves in the dry stove, at the greatest distance from the fire, so that they were in a very temperate warmth; and there they retained their leaves all the winter, and continued in health, when those which were placed in a warmer situation, as also those in the green-house, were entirely destroyed.

PARNASSIA. *Tourn. Inst. R. H.* 246. tab. 127. Grass of Parnassus.

The Characters are,

The flower hath a spreading empalement, cut into five parts. The flower has five roundish concave petals, which have five heart-shaped concave nectariums, and five stamina terminated by depressed summits, with a large oval germen having no style, but four obtuse stigmas in their place. The germen afterward turns to an oval four-cornered capsule with one cell, containing several oblong seeds.

The Species are,

1. PARNASSIA *palustris* & *vulgaris. Inst. R. H.* Common Marsh Grass of Parnassus.

2. PARNASSIA *vulgaris, flore pleno.* Common Grass of Parnassus, with a double flower.

The former of these sorts grows wild in moist meadows in several parts of *England*, but particularly in the north. It grows on the other side of *Watford*, in the low meadows by *Cassio-berry*, where it is in pretty great plenty.

The other sort is an accidental variety of the former, which has been discovered wild, and transplanted into gardens. This is but rarely to be found, being in very few gardens at present.

These plants may be taken up from the natural places of their growth, with balls of earth to their roots, and planted into pots filled with pretty strong, fresh, undunged earth, and placed in a shady situation, where, if they are constantly watered, they will thrive very well, and flower every summer;

summer; but if the plants are planted in the full ground, it should be in a very moist shady border, otherwise they will not live; and these should be as duly watered as those in the pots in dry weather, to make them produce strong flowers.

They may be propagated by parting of their roots, which should be done in *March*, before they put out new leaves, but the roots should not be divided too small, for that will prevent their flowering the following summer. These roots should always be planted in pretty strong fresh earth, for they will not thrive in a light rich soil. In the spring they must be constantly watered, if the season should prove dry, otherwise they will not flower; nor should they be parted oftener than every third year, to have them strong. These plants flower in *July*, and their seeds are ripe the latter end of *August*.

PARONYCHIA. *Tourn. Inst. R. H. 507. tab. 281.* Mountain Knot Grass.

The Characters are,

The empalement of the flower is five-cornered. The flower has no petals, but has five hair-like stamina within the empalement, terminated by single summits, and an oval acute germen, sitting upon a short style, crowned by an obtuse stigma. The empalement afterward turns to a roundish capsule with one cell, opening with five valves, containing one large, roundish, acute-pointed seed.

The Species are,

1. PARONYCHIA floribus sessilibus axillaribus, bracteis nitidis, caulibus procumbentibus. Mountain Knot Grass, with flowers sitting close to the wings of the stalks, having neat bractæ and trailing stalks.

2. PARONYCHIA caulibus diffusis procumbentibus, floribus conglomeratis, bracteis nitidis. Mountain Knot Grass with diffused trailing stalks, flowers growing in clusters, whose bractæ are very neat.

There are two or three other species of this genus, which grow naturally in the south of *France* and *Italy*, which having little beauty, are rarely admitted into gardens, so it would be needless to enumerate them here.

The first sort here mentioned, grows naturally in *Spain*. This hath trailing stalks like those of common Knot Grass, which are a foot and a half long, putting out several side branches, which are garnished with small leaves like those of the common Knot Grass, but smaller, sitting close to the stalks. The flowers come out at the wings of the leaves, sitting close to the stalks; these have silvery neat bractæ, which inclose the flowers, which are so small as not to be visible, unless they are close to the sight. The flowers appear in *July*, but unless the season is very warm, the seeds do not ripen in *England*.

The second sort grows naturally in *Spain*. The stalks of this plant are larger, and the branches more diffused than those of the first sort, but trail upon the ground in the like manner. The flowers come out in close clusters upon short foot-stalks from the side of the branches, surrounded by leaves, shaped like those of the broad-leaved Knot Grass; the bractæ of these flowers are silvery and neat, like those of the first sort.

These plants seldom continue longer than two or three years, and rarely ripen seeds here, but in warm dry seasons; but cuttings of them will take root. The plants will rise from seeds in the open air, and will live abroad in mild winters, but in hard frosts they are destroyed.

PARSLEY. See Apium.

PARSNIP. See Pastinaca.

PARTHENIUM. *Lin. Gen. Plant. 939.* Bastard Feverfew.

The Characters are,

It hath a flower composed of hermaphrodite florets and female

half florets, which are inclosed in a common five leaved spreading empalement. The hermaphrodite flowers which form the disk, have one tubulous petal cut into five parts at the brim; they have five hair-like stamina the length of the tube. The germen is situated below the flower, and is scarce visible, supporting a slender style, having no stigma; these flowers are barren. The female flowers, which compose the rays or border, are stretched out on one side, like a tongue; these have a large heart-shaped compressed germen, with a slender style, crowned by two long spreading stigmas. These flowers are succeeded by one heart-shaped compressed seed.

The Species are,

1. PARTHENIUM foliis composito-multifidis. *Lin. Hort. Cliff.*

442. Parthenium with many-pointed compound leaves.

2. PARTHENIUM foliis ovatis crenatis. *Lin. Hort. Cliff.*

442. Parthenium with oval crenated leaves.

The first sort grows wild in great plenty in the island of *Jamaica*, and in some other of the *English* settlements in the *West-Indies*, where it is called wild Wormwood, and is used by the inhabitants as a vulnerary herb.

The second sort grows plentifully in several parts of the *Spanish West-Indies*, from whence the seeds have been brought to *Europe*.

The first is an annual plant, which may be propagated by sowing the seeds on a hot-bed early in the spring; and when the plants are come up, they should be transplanted on another hot-bed, at about five or six inches distance. When the plants have grown so as to meet each other, they should be carefully taken up, preserving a ball of earth to their roots, and each planted into a separate pot, filled with light rich earth; and if they are plunged into a moderate hot-bed, will greatly facilitate their taking fresh root; but where this conveniency is wanting, the plants should be removed to a warm sheltered situation, where they must be shaded from the sun until they have taken new root; after which time they may be exposed, with other hardy annual plants, in a warm situation, where they will flower in *July*, and their seeds will ripen in *August* and *September*.

The second sort is a perennial plant, which dies to the ground every autumn, and shoots up again the following spring. The seeds of this sort were sent me by my good friend *Dr. Thomas Dale*, from *South Carolina*, where the plants grow wild. This may be propagated by parting of the roots in autumn, and may be planted in the full ground, where it will abide the cold of our ordinary winters very well. This sort flowers in *July*, but seldom produces good seeds in *England*.

These plants make no great appearance, so are seldom cultivated but for the sake of variety.

PASQUE FLOWER. See Pulsatilla.

PASSERINA. *Lin. Gen. Plant. 440.* Sparrow-wort.

The Characters are,

The flower has no empalement; it has one withered petal, having a slender cylindrical tube swelling below the middle. It hath eight bristly stamina, sitting on the top of the tube, terminated by erect summits. It has an oval germen under the tube, having a slender style rising on one side of the germen, crowned by a beaded stigma, set with prickly hairs on every side. The germen afterward turns to an oval seed pointed at both ends, inclosed in a thick oval capsule of one cell.

The Species are,

1. PASSERINA foliis linearibus convexis quadrifariam imbricatis, ramis tomentosis. *Lin. Sp. Plant. 559.* Sparrow-wort with linear convex leaves imbricated four ways, and downy branches.

2. PASSERINA foliis carnosis extus glabris, caulibus tomentosis. *Lin. Sp. Plant. 559.* Swallow-wort with fleshy leaves, which are smooth on their outside, and downy stalks.

3. *PASSERINA foliis lanceolatis subciliatis erectis, ramis nudis. Lin. Sp. Plant. 559.* Sparrow-wort with spear-shaped erect leaves, having small hairs and naked branches.

4. *PASSERINA foliis linearibus oppositis, floribus terminalibus solitariis, ramis glabris. Lin. Sp. Plant. 560.* Sparrow-wort with linear leaves placed opposite, single flowers terminating the branches, and smooth stalks.

The first sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk five or six feet high, sending out branches the whole length; these, when young, grow erect, but as they advance in length, they incline toward an horizontal position; but more so, when the small shoots toward the end are full of flowers and seed-vessels, which weigh down the weak branches from their upright position. The branches are covered with a white down like meal, and are closely garnished with very narrow leaves, which are convex, and lie over each other in four rows like the scales of fish, so as that the young branches seem as if they were four-cornered. The flowers come out at the extremity of the young branches, from between the leaves, on every side; they are small and white, so make but little appearance, and are succeeded by small seed-vessels, which seem withered and dry.

This plant may be propagated by cuttings during any of the summer months; these may be planted in a bed of loamy earth, and closely covered with a bell or hand-glass to exclude the air, shading them every day from the sun, and refreshing them now and then with water. With this treatment the cuttings will have taken root in about two months, when they may be taken up, and each planted in a small pot, filled with soft loamy earth, placing them in the shade till they have taken new root; then they may be removed into a sheltered situation, where they may remain till *October*, when they must be placed in the green-house, for they will not live in the open air through the winter in *England*, but they require no other treatment, than Myrtles and other hardy green-house plants, which is only to screen them from frost. As this plant retains its verdure all the year, so it makes a pretty variety in the green-house in winter.

The second sort grows naturally in *Spain* and *Portugal*. This hath shrubby stalks, which rise to a greater height than the former; the branches grow more diffused than those of the former; they are covered with a mealy down, and are garnished with short, thick, succulent leaves, lying over each other like the scales of fish; they are smooth, and green on their outside, but downy on their inner. The flowers are small and white, like those of the former. This plant will live abroad in ordinary winters, if it is planted in a dry soil and a warm situation, but in hard frosts they are frequently destroyed, therefore one or two plants should be kept in pots, and sheltered in winter to preserve the species. This may be propagated by cuttings, in the same way as the former sort.

The third sort grows naturally in *Spain* and *Portugal*, as also at the *Cape of Good Hope*. This hath a shrubby stalk, rising five or six feet high, sending out many branches, which are naked to their ends, where they are garnished with oblong leaves standing erect, which have hairy points. The flowers are small, white, and come out between the leaves at the end of the branches, but are not succeeded by seeds in *England*. This may be propagated by cuttings as the two former, and requires the same treatment.

The fourth sort grows naturally at the *Cape of Good Hope*. It hath a low shrubby stalk, which seldom rises more than a foot high, dividing into many slender branches, which are smooth, and spread out on every side; these are garnished with very narrow leaves placed opposite; they are of a dark green, and have the appearance of those of the

Pir-tree, but are narrower. The flowers come out singly at the end of the branches; these are larger than those of the former, and their upper part is spread open almost flat; they are of a purple colour. This may be propagated by cuttings as the other sorts, and the plants must be treated as the first sort.

PASSIFLORA. Lin. Gen. Plant. 910. Passion-flower.

The Characters are,

The flower has a plain-coloured empalement of five leaves, and five half spear-shaped petals, which are large, plain, and obtuse. The nectarium hath a tripple crown; the outer, which is longer, is fastened to the inside of the petal, but is larger and compressed above. It has five awl-shaped stamina, fastened at their base to the column of the style annexed to the germen. The style is an erect cylindrical column, upon whose top sits an oval germen, with three smaller styles which spread out. The germen afterward becomes an oval fleshy fruit with one cell, sitting at the end of the style, filled with oval seeds, fastened longitudinally to the skin or shell.

The Species are,

1. *PASSIFLORA foliis trilobis serratis. Amæn. Acad. Vol. I. p. 230.* Passion-flower, with leaves having three-sawed lobes; commonly called three-leaved Passion-flower.

2. *PASSIFLORA foliis palmatis integerrimis. Amæn. Acad. Vol. I. p. 231.* Passion-flower with hand-shaped entire leaves; or the common Passion-flower.

3. *PASSIFLORA foliis trilobis cordatis æqualibus obtusis glabris integerrimis. Amæn. Acad. Vol. I. p. 224.* Passion-flower with heart-shaped leaves, having three equal lobes, which are smooth, obtuse, and entire.

4. *PASSIFLORA foliis trilobis integerrimis, lobis sub-lanceolatis, intermedio productiore. Amæn. Acad. Vol. I. p. 229.* Passion-flower with leaves having three entire lobes, which are somewhat spear-shaped, and the middle one longer than the others.

5. *PASSIFLORA foliis trilobis integerrimis glabris, cortice suberoso.* Passion-flower with leaves having three entire smooth lobes, and a Cork-like bark.

6. *PASSIFLORA foliis hastatis glabris, petalis forum angustioribus.* Passion-flower with halberd-pointed smooth leaves, and narrow petals to the flowers.

7. *PASSIFLORA foliis trilobis cordatis pilosis, involucri multifido capillaribus. Amæn. Acad. I. p. 228.* Passion-flower with leaves having three hairy lobes, and the involucre of the flower composed of many-pointed hairs.

8. *PASSIFLORA foliis hastatis pilosis amplioribus, involucri multifido-capillaribus.* Passion-flower with the largest halberd-pointed hairy leaves, and empalements composed of many-pointed hairs.

9. *PASSIFLORA foliis trilobis, basi utrinque denticulo reflexo. Amæn. Acad. I. p. 229.* Passion-flower with leaves having three lobes, indented on each side the base, and reflexed.

10. *PASSIFLORA foliis bilobis cordatis oblongis petiolatis. Lin. Sp. Plant. 957.* Passion-flower with oblong heart-shaped leaves, having two lobes standing upon foot-stalks.

11. *PASSIFLORA foliis bilobis cuneiformibus, basi biglandulosis, lobis acutis divaricatis. Amæn. Acad. I. 223.* Passion-flower with wedge-shaped leaves having two lobes, and two glands at their base, whose lobes are acute, and spread from each other.

12. *PASSIFLORA foliis bilobis obtusis, basi emarginatis petiolatis.* Passion-flower with leaves having two obtuse lobes, which are indented at the base, and have foot-stalks.

13. *PASSIFLORA foliis bilobis glabris rigidis, basi indivisis.* Passion-flower with stiff smooth leaves having two lobes, which are undivided at their base.

14. *PASSIFLORA foliis bilobis transversis amplexicaulibus. Amæn. Acad. I. p. 222.* Passion-flower with transverse leaves, having two lobes embracing the stalk.

15. *PASSIFLORA foliis cordato-oblongis integerrimis, caule triquetro, involucris integerrimis.* Passion-flower with heart-shaped, oblong, entire leaves, a three-cornered stalk, with entire covers to the flowers; commonly called *Granadilla* in the *West-Indies*.

16. *PASSIFLORA foliis oblongis integerrimis, involucris dentatis.* Passion-flower with oblong entire leaves, and the covers of the flowers indented; commonly called *Water Lemon* in the *West-Indies*.

17. *PASSIFLORA foliis indivisis ovatis integerrimis, petiolis aequalibus.* *Amœn. Acad. Vol. I. p. 219.* Passion-flower with undivided, oval, entire leaves, and equal foot-stalks.

18. *PASSIFLORA foliis indivisis serratis.* *Amœn. Acad. 1. p. 213.* Passion-flower with undivided sawed leaves.

19. *PASSIFLORA foliis indivisis oblongis integerrimis, floribus confertis.* *Amœn. Acad. 1. p. 221.* Passion-flower with undivided, oblong, entire leaves, and flowers growing in clusters.

The first sort grows naturally in *Virginia* and other parts of *North America*, and was the first known in *Europe* of all the species, but was not very common in the *English* gardens till of late years. The root of this plant is perennial, but the stalk is annual in *North America*, dying to the ground every winter, as it also does in *England*, unless it is placed in a stove. The stalks of this are slender, rising about four or five feet high, having tendrils or clasps at each joint, which fasten themselves about whatever plants stand near them, whereby the stalk is supported. At each joint comes out one leaf upon a short foot-stalk; these have for the most part three oblong lobes, which join at their base, but the two side lobes are sometimes divided part of their length into two narrow segments, so as to resemble a five-lobed leaf; they are thin, of a light green, and slightly sawed on their edges. The flowers are produced from the joints of the stalk at the foot-stalks of the leaves; these have long slender foot-stalks. The involucre of the flower is composed of five oblong blunt-pointed leaves, of a pale green; these open and disclose five more leaves or petals, which are white, having a fringe or circle of rays of a double order round the style, of a purple colour, the lower row being the longest. In the center of this arises the pillar-like style, with the roundish germen at the top, surrounded at the bottom, where it adheres to the style, with five flattish stamina, which spread out every way, and sustain each of them an oblong summit, which hangs downward, and on their under side are covered with a yellow farina. The flowers have an agreeable scent, but are of short duration, opening in the morning, and fade away in the evening, never opening again, but are succeeded by fresh flowers, which come out at the joints of the stalk above them. When the flowers fade, the roundish germen swells to a fruit as large as a middling *Apple*, which changes to a pale *Orange* colour when ripe, inclosing many oblong rough seeds inclosed in a sweetish pulp.

This sort is usually propagated by seeds, which are brought from *America*, for the seeds do not often ripen in *England*; though I have had sometimes several fruit perfectly ripe on plants, which were plunged in a tan-bed under a deep frame; but those plants, which are exposed to the open air, do not produce fruit here. The seeds should be sown upon a moderate hot-bed, which will bring up the plants much sooner than when they are sown in the open air, so they will have more time to get strength before winter. When the plants are come up two or three inches high, they should be carefully taken up, and each planted in a separate small pot filled with good kitchen-garden earth, and plunged into a moderate hot-bed to forward their taking new root; after which they should be gradually indred to bear the open air, to which they should

be exposed in summer, but in the autumn they must be placed under a garden-frame to screen them from the frost, but they should have the free air at all times in mild weather. The spring following some of these plants may be turned out of the pots, and planted in a warm border, where, if they are covered with tanners bark every winter to keep out the frost, they will live several years, their stalks decaying in the autumn, and new ones arise in the spring, which in warm seasons will flower very well. If those plants, which are continued in pots, are plunged into a tan-bed, some of them may produce fruit; and, if the stalks of these are laid down into pots of earth plunged near them, they will take root, so that the plants may be easily propagated this way.

The second sort has not been many years in *England*, but is now the most common. This grows naturally in the *Brazils*, yet is hardy enough to thrive in the open air here, and is seldom injured except in very severe winters, which commonly kills the branches to the ground, and sometimes destroys the roots; this rises in a few years to a great height, if they have proper support. I have seen some of these plants, whose branches were trained up more than forty feet high. The stalks will grow almost as large as a man's arm, and are covered with a purplish bark, but do not become very woody. The shoots from these stalks are often twelve or fifteen feet long in one summer; they are very slender, so must be supported, otherwise they will hang to the ground, intermix with each other, and appear very unsightly. These are garnished at each joint with one hand-shaped leaf, composed of five smooth entire lobes. Their foot-stalks are near two inches long, and have two small leaves or ears embracing the stalks at their base; and from the same point comes out a long clasper, which twists round the neighbouring plants, whereby the stalks are supported. The flowers come out at the same joints as the leaves; these have foot-stalks almost three inches long; they have an outer cover composed of three concave oval leaves, of a paler green than the leaves of the plant, which are little more than half the length of the empalement, which is composed of five oblong blunt leaves, of a very pale green; within these are five petals, nearly of the same shape and size with the empalement, standing alternately between them. In the center of the flower arises a thick club-like column about an inch long, on the top of which sits an oval germen, from whose base spreads out five awl-shaped horizontal stamina, which are terminated by oblong broad summits fastened in the middle to the stamina, hanging downward; these may be moved round without separating from the stamina; their under surface is charged with yellow farina, and, on the side of the germen, arise three slender purplish styles near an inch long, spreading from each other, terminated by obtuse stigmas. Round the bottom of the column are two orders of rays, the inner, which is the shortest, inclines upward to the column, the outer, which is near half the length of the petals, spreads flat upon them; these rays are composed of a great number of thread-like filaments, of a purple colour at bottom, but are blue on the outside. These flowers have a faint scent, and continue but one day; after they fade, the germen on the top of the column swells to a large oval fruit, about the size and shape of the *Mogul Plumb*, and when ripe is of the same pale yellow colour, inclosing a sweetish disagreeable pulp, in which are lodged oblong seeds. This plant begins to flower early in *July*, and there is a succession of flowers daily, till the frost in autumn puts a stop to them.

It may be propagated by seeds, which should be sown in the same manner as those of the first sort, and the plants treated in the same way till the following spring, when they

should be turned out of the pots, and planted against a good aspected wall, where they may have height for their shoots to extend, otherwise they will hang about and entangle with each other, so make but an indifferent appearance; but where buildings are to be covered, this plant is very proper for the purpose. After they have taken good root in their new quarters, the only care they will require is to train their shoots up against the wall, as they extend in length, to prevent their hanging about; and if the winter proves severe, the surface of the ground about their roots should be covered with mulch to keep the frost from penetrating of the ground; and if the stalks and branches are covered with mats, Peas haulm, straw, or any such light covering it will protect them in winter; but this covering must be taken off in mild weather, otherwise it will cause the branches to grow mouldy, which will be more injurious to them than the cold. In the spring the plants should be trimmed, when all the small weak shoots should be entirely cut off, and the strong ones shortened to about four or five feet long, which will cause them to put out strong shoots for flowering the following year.

This plant is also propagated by laying down the branches, which in one year will be well-rooted, so may be taken off from the old plants and transplanted, where they are designed to remain. The cuttings of this will also take root, if they are planted in a loamy soil not too stiff, in the spring, before they begin to shoot. If these are covered with bell or hand glasses to exclude the air, they will succeed much better than when they are otherwise treated; but when the cuttings put out shoots, the air should be admitted to them, otherwise they will draw up weak and spoil, they must be afterward treated as the layers.

Those plants, which are propagated by layers or cuttings, do not produce fruit so plentifully as the seedling plants, and I have found the plants, which have been propagated two or three times, either by layers or cuttings, seldom produce fruit, which is common to many other plants.

If in very severe winters the stalks of these plants are killed to the ground, the roots often put out new stalks the following summer, therefore they should not be disturbed; and where there is mulch laid on the ground about their roots, there will be little danger of their being killed, although all the stalks should be destroyed.

There is a variety of this; the lobes of the leaves are much narrower, and are divided almost to the bottom. The flowers come later in the summer; the petals of the flowers are narrower, and of a purer white, but I believe it is only a feminal variation of the other, so not worthy of being enumerated.

The third sort grows naturally in *Virginia*, and also in *Jamaica*. This hath a perennial creeping root, sending up many weak stalks about three or four feet high, which are garnished with leaves shaped very like those of Ivy, and are almost as large, but of a pale green and very thin consistence. The flowers come out from the wings of the stalk, upon slender foot-stalks, an inch and a half long, and at their base arise very slender tendrils, which clasp round any neighbouring support. The flowers are of a dirty yellow colour, and not larger than a sixpence when expanded, so make no great appearance. This may be propagated by its creeping roots, which may be parted in *April*, and planted where they are to remain. This sort will live in a warm border, if treated in the same way as is directed for the first sort. Some of these plants lived many years in the *Chelsea* garden, in a border to a south-west aspect, but in the year 1740 they were killed by the frost.

The fourth sort grows naturally in *Jamaica*. This hath a perennial root, from which arise several slender stalks four or five feet high, which have joints four or five inches

afunder; at each of these come out one leaf, a tendril, and a flower. The leaves have three lobes. The flowers are smaller than those of the last mentioned, and are of a greenish colour; these are succeeded by oval fruit, about the size of small Olives, which turn purple when they are ripe.

The fifth sort grows naturally in most of the *West-India* islands; this rises with a weak stalk to the height of twenty feet. As the stalks grow old, they have a thick fungous bark, like that of the Cork-tree, which cracks and splits. The smaller branches are covered with a smooth bark, and garnished with smooth leaves at each joint, sitting upon very short foot-stalks; these have three lobes, the middle one being much longer than those on the sides, so that the whole leaf has the form of the point of those halberds used by the yeomen of the guards. The flowers are small, of a greenish yellow colour, and are succeeded by small oval fruit, of a dark purple colour when ripe.

The sixth sort grows naturally in the *West-Indies*. This hath a perennial root, from which arise several slender stalks, which rise eight or ten feet high, garnished with smooth green leaves, standing upon slender foot-stalks. They are but slightly indented into three lobes, which end in acute points, and are shaped like the points of halberds, the middle one standing oblique to the foot-stalk. The flowers come out from the wings of the leaves on very short foot-stalks; they are of a pale yellow. The petals of the flowers are very narrow, and longer than those of the two former sorts; the fruit is smaller, and of an oval form, changing to a dark purple when ripe.

The seventh sort grows naturally in most of the islands in the *West-Indies*, where the inhabitants of the *British* islands call it Love in a Mist. The root of this is annual; the stalks rise five or six feet high, when they are supported; they are channelled and hairy. The leaves are heart-shaped, divided into three lobes, the middle lobe being much the longest; they are covered with short brown hairs. The tendrils come out at the same place as the leaves, as do also the flowers, whose foot-stalks are long, hairy, and pretty strong. The empalement of the flower is composed of slender hairy filaments, which are wrought like a net; these are longer than the petals of the flower, and turn up round them, so that the flowers are not very conspicuous at a distance; these are white, and of a short duration; their structure is the same with the other sorts, and they are succeeded by roundish oval fruit, about the size of an ordinary Golden Pippin, of a yellowish green colour, inclosed with the netted empalement. This plant is propagated by seeds, which should be sown upon a hot-bed early in the spring, and when the plants are fit to remove, they should be each transplanted into a small pot filled with light kitchen-garden earth, and plunged again into a hot-bed, observing to shade them from the sun till they have taken new root; after which time they must be treated in the same way as other plants from the same country, shifting them into larger pots as their roots increase; and when the plants are too tall to remain under the glasses of the hot-bed, they should be removed into an airy glass-case, where they should have the free air admitted to them in warm weather, but screened from the cold. In this situation the plants will flower in *July*, and their seeds will ripen in the autumn. The whole plant has a disagreeable scent when touched.

There is a variety of this, if it is not a distinct species, with hairy leaves not so broad as those of the former. The whole leaf is shaped more like the point of a halberd, and those leaves, which grow toward the upper part of the stalks, have very small indentures, so approach near to simple leaves without lobes. The flowers are also smaller, but of the same form, and the roots are of shorter duration, so that I am inclined to believe it is a distinct species.

The eighth fort has some appearance of the seventh, so that many persons have supposed it was only an accidental variety of it, but there can be no doubt of its being a different species. The stalks of this rise upward of twenty feet high, and will continue two or three years; the leaves are larger, but of the same shape, and hairy; the tendrils of this fort are very long, as are also the foot-stalks of the flowers, which are smooth, not hairy as the former; the empalement of the flowers is netted, but not so long as in the former fort; the flowers are larger, and the rays are of a light blue colour; the fruit is much less and rounder than those of the other, and when ripe changes to a deep yellow colour.

The ninth fort was discovered by the late Dr. *Houssoun*, growing naturally at *La Vera Cruz*. This is a perennial plant; the stalks rise twenty feet high, dividing into many slender branches, which are covered with a soft hairy down. The leaves are shaped like the point of a halberd, of a light green; they are soft and silky to the touch, standing oblique to the foot-stalks. The flowers come out at the wings of the leaves like the other species; these are not half so large as those of the second fort, but are of the same form. The petals are white, and the rays or filaments are purple, with a mixture of yellow. The fruit of this is small, roundish, and yellow when ripe.

The tenth fort grows naturally in *Jamaica*. This is a perennial plant; the stalks are slender, and rise to twenty feet high when they are supported, and divide into many weak branches; the leaves, flowers, and tendrils, come out at each joint. The leaves have three longitudinal veins, which join at the base to the foot-stalk, but the two outer diverge toward the borders of the leaf in the middle, drawing inward again at the top. The leaves are of a deep green on their upper side, but are pale on their under, and stand upon short foot stalks; the foot-stalks of the flowers are very slender, of a purplish colour. The flowers are shaped like those of the other species, but when expanded are not more than an inch and a half diameter, of a soft red colour, and little scent. The fruit is small, oval, and, when ripe, changes to a purple colour.

The eleventh fort was discovered by the late Mr. *Robert Millar* growing naturally near *Carthagena* in *New Spain*. This hath slender striated stalks, of a brownish red colour, dividing into many slender branches, which are garnished with leaves, shaped like the wings of a bat when extended; they are about seven inches in length, measuring from the two extended points, which may rather be termed the breadth, for from the base to the top they are not more than two inches and a half. The foot-stalk is set half an inch from the base of the leaf, from which come out three ribs or veins; two of them extend each way to the two narrow points of the leaf, the other rises upright to the top, where is the greatest length of the leaf, if it may be so termed. The figure of this leaf is the most singular of any I have yet seen: the flowers come out at the joints of the stalk like the others, upon short slender foot-stalks; they are about three inches diameter when expanded. The petals and rays are white; the rays are twisted and slender, extending beyond the petals. The fruit of this I have not seen entire.

The twelfth fort was discovered by the late Dr. *Houssoun*, growing naturally at *La Vera Cruz* in *New Spain*. This hath slender angular stalks, which rise twenty feet high, sending out many branches, which are garnished with moon-shaped leaves, and have two blunt lobes, spreading asunder each way, so as to have the appearance of a half-moon. The flowers and tendrils come out from the same joints of the stalks. The flowers are of a pale colour and small, but shaped like those of the other forts; these are succeeded by oval fruit of a purple colour, about the size of small oval Grapes.

The thirteenth fort has some resemblance of the twelfth, but the stalks are rounder and become ligneous. The leaves are almost as stiff as those of the Bay-tree, and are not so deeply divided as those of the former. The flowers stand upon long foot-stalks, which are horizontal; they are small, white, and shaped like those of the other fort. The fruit is oval, small, and of a purple colour, fitting close to the petals of the flowers, which are permanent.

The fourteenth fort grows naturally in most of the islands in the *West-Indies*. This is by *Tournefort* separated from this genus, and titled by him *Murucua*, which is the *Brazilian* name for it. This hath slender climbing stalks, which are channelled, putting out tendrils at the joints, which fasten themselves about the neighbouring plants for support, and climb to the height of ten or twelve feet, garnished with leaves, which are cut into two lobes at their base, but at the top are only a little hollowed at a distance from each point, rising again in the middle opposite the foot-stalk. The base of the two lobes spread and meet, so that they appear as if they embraced the stalk, but when they are viewed near, they are found divided to the short crooked foot-stalk, which does scarcely appear. There are two purplish veins arising from the foot-stalk, which extend each way to the points of the lobes; the tendrils, which come out with the leaves, are long, tough, and of a purple colour. The flowers are produced toward the end of the branches, coming out by pairs on each side; they have purple foot-stalks, sustaining one flower at the top, whose empalement is composed of five purple leaves, which form a kind of tube, and within are five very narrow purple petals. The column in the center of the flower is of the same length as the petals, but the stamina are extended an inch above. When the flowers fade, the germen swells to an oval purple fruit, the size of the small red Gooseberry, inclosing a soft pulp, in which are lodged the seeds.

The fifteenth fort grows naturally in the *West-Indies*, where the inhabitants call it *Granadilla*. The fruit of this fort is commonly eaten there, being served up to their tables in deserts. This hath a thick, climbing, herbaceous, triangular stalk, sending out slender tendrils at each joint, which fasten to the bushes and hedges for support, rising to the height of fifteen or twenty feet, garnished at each joint with one large oval leaf. There are two large stipulæ or ears joined to the stalks, which encompass the foot-stalks of the flowers and leaves, as also the base of the tendril. The leaves are of a lively green, having one strong nerve or midrib running longitudinally, from which arise several small veins, which diverge to the sides, and incurve again toward the top. The flowers stand upon pretty long foot-stalks, which have two small glandules in the middle; the cover of the flower is composed of three soft velvety leaves, of a pale red, with some stripes of a lively red colour; the petals of the flower are white, and the rays are blue. These flowers are large, so make a fine appearance during their continuance, but they are like the other species, of short duration, however there is a succession of flowers for some time on the plants. After the flowers are past, the germen swells to a roundish fruit, the size of a middling Apple, of a yellow colour when ripe, having a thicker rind than any of the other forts, inclosing a sweetish pulp, in which are lodged many oblong flat seeds, of a brownish colour, a little rough to the touch.

The sixteenth fort grows naturally in the *West-Indies*. This hath climbing tough stalks, which put out clasps at every joint like the others, which fasten to the neighbouring trees and hedges for support, and rise upward of twenty feet high, sending out many side branches. The leaves are four or five inches long, and two broad, of a pretty thick consistence, and a bright green on their upper side, but pale

pale on their under. The flowers come out at the joints of the stalks; the buds of the flowers are as large as pigeons eggs, before they begin to expand. The cover of the flower is composed of three large, oval, green leaves, which are indented on their edges, and hollowed like a spoon; within these is the empalement of the flower, which is composed of five oblong leaves, of a pale green on their outside, but whitish within. The petals of the flower are white, and stand alternately with those of the empalement, but are not more than half their breadth, and are marked with several small, brownish, red spots. The rays of the flower are of a Violet colour; the column in the center is yellowish, as is also the round germen at the top, but the three styles are of a purple colour. These flowers have an agreeable odour, and when they fade, the germen swells to the size of a pullet's egg, nearly of the same shape, which turns yellow when ripe. The rind is soft and thick; the pulp has an agreeable acid flavour, which quenches thirst, abates the heat of the stomach, gives an appetite, and recruits the spirits, so is commonly given in fevers. The seeds are heart-shaped and brownish.

The seventeenth sort grows naturally in the *Bahama* islands; this hath slender, climbing, three cornered stalks, which send out tendrils at each joint, fastening themselves to any neighbourly support. The stalks climb to the height of twelve or fourteen feet, and are garnished with oblong oval leaves. Their foot stalks are slender, from which arise three longitudinal veins, one running through the middle of the leaf, the other two diverge to the sides, drawing toward each other again at the point. The flowers come out from the wings of the stalk upon slender foot-stalks; the empalement of the flower is composed of five oblong, narrow, purple leaves, and within are five narrower petals of the same colour, which turn backward after they have been some time expanded. The column in the middle of the flower is very long and slender, supporting a round germen, from whose base spread out five slender stamina, terminated by oblong hanging summits; from the top of the germen arise three slender styles, which spread asunder, crowned by roundish summits. When the flowers fade, the germen swells to an oval fruit, about the size of a sparrow's egg, which changes to a purple colour when ripe, filled with oblong seeds inclosed in a soft sweet pulp.

The nineteenth sort was discovered by the late Dr. *Houffoun*, at *La Vera Cruz* in *New Spain*. This hath slender climbing stalks, sending out many small branches, which climb to the height of twenty-five or thirty feet, when they meet with neighbouring support, to which they fasten themselves by their tendrils. The stalks by age become ligneous toward the bottom; their joints are not far asunder. The leaves stand upon short slender foot-stalks; they are smooth, entire, and of a lively green colour. The flowers come out from the wings of the leaves, standing upon long foot-stalks; the empalement of the flower is composed of five oblong leaves, green on their outside, but whitish within. The flower has five oblong white petals situated alternately to the leaves of the empalement, which spread open; the rays are of a bluish purple colour, inclining at the bottom to red; the column in the center is short and thick; the germen on the top is oval, and, after the flowers fade, swells to the size of a pullet's egg, and changes to a pale yellow when ripe, having many oblong seeds inclosed in a soft pulp. The flowers of this kind have an agreeable odour, but are of short duration, seldom continuing twenty hours open; but there is a succession of flowers on the plants, from *June* to *September*, and sometimes the fruit will ripen here.

All the perennial sorts which are natives of the hot parts

of *America*, require a stove to preserve them here, without which they will not thrive; for although some of the sorts will live in the open air during the warm months in summer, yet they make but little progress; nor will the plants produce many flowers, unless the pots in which they are planted, are plunged into the tan-bed of the stove, and their branches are trained against an espalier. The best way to have them in perfection, is to make a border of earth on the back-side of the tan-bed, which may be separated by planks to prevent the earth from mixing with the tan; and when the plants are strong enough, they should be turned out of the pots, and planted in this border; adjoining to which, should be a trellage erected to the top of the stove; against this the stalks of the plants must be trained, and as they advance they will form a hedge to hide the wall of the stove, and their leaves continuing green all the year, together with their flowers, which will be very plentifully intermixed in summer, will have a very agreeable effect.

As there will be only a plank partition between the earth and the tan, so the earth will be kept warm by the tan-bed, which will be of great service to the roots of the plants. This border should not be less than two feet broad and three deep, which is the usual depth of the pit for tan; so that where these borders are intended, the pits should not be less than eight feet broad, that the bark-bed, exclusive of the border, may be six feet wide. If the border is fenced off with strong ship planks, they will last some years, especially if they are well painted over with a composition of melted pitch, brick-dust and oil, which will preserve them found a long time; and the earth should be taken out carefully from between the roots of the plants, at least once a year, putting in fresh; with this management, I have seen these plants in great perfection. But where there has not been this conveniency, I have turned the plants out of the pots, and planted them into the tan, where it was half rotten, into which they have rooted exceedingly, and have thriven for two or three years as well as could be desired; but when their roots extended to a great distance in the tan-bed, they have been injured by renewing of the bark; when it has fermented pretty violently, the roots have been scalded, and the plants have been killed, so that the other method is more eligible.

As these sorts do not often perfect their seeds here, so they may be propagated by laying down their branches, which, if done in *April*, they will put out roots by the middle of *August*, when they may be separated from the old plants, and either planted in pots to get strength, or into the border of the stove, where they are to remain.

Some of these sorts may also be propagated by cuttings; these should be planted in pots about the middle or latter end of *March*, and plunged into a moderate hot-bed, observing to screen them from the sun, and refresh them with water gently, as often as the earth may require it; and in about two months or ten weeks, they will put out roots, and may then be treated as the seedling plants.

PASSION-FLOWER. See *Passiflora*.

PASTINACA. *Journ. Inst. R. H.* 319. tab. 170. Parsnep.

The Characters are,

It hath an umbellated flower; the principal umbel is composed of many smaller, and these are likewise composed of several rays. They have no involucreum, and the empalement is scarce visible; the umbel is uniform. The flowers have five spear-shaped incurved petals, and five hair-like stamina. The germen is situated under the flower, supporting two reflexed styles. The germen afterward becomes an elliptical, plain, compressed fruit, dividing in two parts, having two bordered elliptical seeds.

The Species are,

1. PASTINACA foliis simpliciter pinnatis hirsutis. Parsnep with single, winged, hairy leaves; wild Parsnep.

2. PAS-

2. *PASTINACA foliis simpliciter pinnatis glabris.* Parsnep with single, winged, smooth leaves; Garden Parsnep.

3. *PASTINACA foliis decompositis pinnatis.* Hort Cliff. 105. Parsnep with decomposed winged leaves; or Opopanax.

The first sort grows naturally on the side of banks, and on dry ground in many parts of *England*. This is a biennial plant, the first year shooting out hairy leaves which spread on the surface of the ground, which are singly winged; and the lobes are irregularly cut. The following year the stalks rise four or five feet high, these are channelled, hairy, and garnished with winged leaves like those at the bottom, but smaller; the stalk branches out toward the top, each branch being terminated by a large umbel of yellow flowers, which are succeeded by compressed fruit, having two flat bordered seeds.

The root and seed of this sort is sometimes used in medicine, but it is seldom cultivated in gardens, the markets being supplied from the fields; yet the druggists commonly sell the seeds of the garden kind for it, which they may purchase at an easy price when it is too old to grow, but then the seeds can have no virtue left.

The second sort hath smooth leaves of a light or yellowish green colour, in which this differs from the former; the stalks also rise higher, and are deeper channelled; the foot-stalks of the umbels are much longer, and the flowers are of a deeper yellow colour. These two sorts have been thought only varieties; the Garden Parsnep they have supposed to differ from the wild only by culture; but I have cultivated both many years, and have never found that either of the sorts have varied; the seeds of each having constantly produced the same sort as they were taken from, so that I am certain they are distinct species.

This sort is cultivated in kitchen gardens, the roots of which are large, sweet, and accounted very nourishing. They are propagated by seeds, which should be sown in *February* or *March*, in a rich mellow soil, which must be well dug, that their roots may run downward, the greatest excellency being the length and bigness of the roots. These may be sown alone, or with Carrots, as is practised by the kitchen-gardeners near *London*; some of whom also mix Leeks, Onions, and Lettuce, with their Parsneps; but this I think very wrong, for it is not possible, that so many different sorts can thrive well together, except they are allowed a considerable distance; and if so, it will be equally the same to sow the different sorts separate. However, Carrots and Parsneps may be sown together very well, especially where the Carrots are designed to be drawn off very young; because the Parsneps generally spread most towards the latter end of summer, which is after the Carrots are gone, so that there may be a double crop upon the same ground.

When the plants are come up, you should hoe them out, leaving them about ten inches or a foot asunder; observing at the same time to cut up all the weeds, which, if permitted to grow, would soon overbear the plants and choke them. This must be repeated three or four times in the spring, according as you find the weeds grow; but in the latter part of summer, when the plants are so strong as to cover the ground, they will prevent the growth of weeds, so that after that season they will require no farther care.

When the leaves begin to decay, the roots may be dug up for use, before which time they are seldom well tasted; nor are they good for much late in the spring, after they are shot out again; so that those who would preserve these roots for spring use, should dig them up in the beginning of *February*, and bury them in sand, in a dry place, where they will remain good until the middle of *April*, or later. These roots are excellent for hogs.

If you intend to save the seeds of this plant, you should make choice of some of the longest, straitest, and largest

roots, which should be planted about two feet asunder, in some place where they may be defended from the strong south and west winds; for the stems of these plants commonly grow to a great height, and are very subject to be broken by strong winds, if exposed thereto; they should be constantly kept clear from weeds, and if the season should prove very dry, you should give them some water twice a week, which will cause them to produce a great quantity of seeds, which will be much stronger than if they were wholly neglected. Toward the latter end of *August* or the beginning of *September*, the seeds will be ripe; at which time you should carefully cut off the heads, and spread them upon a coarse cloth for two or three days, to dry; after which, the seeds should be beaten off, and put up for use; but you should never trust to these seeds, after they are a year old, for they will seldom grow beyond that age.

The leaves of the Garden Parsnep are dangerous to handle, especially in a morning, while the dew remains upon them, at which time, if they are handled by persons who have a soft skin, it will raise it in blisters. I have known some gardeners, when they have been drawing up Carrots from among Parsneps in a morning, when their leaves were wet with dew, draw up the sleeves of their shirts to their shoulders, to prevent their being wet; by doing of which they have had their arms, so far as they were bare, covered over with large blisters; and these were full of a scalding liquor, which has proved very troublesome for several days.

The third sort rises with a green rough stalk seven or eight feet high, garnished with large, decomposed, winged leaves, which are very rough to the touch, and of a dark green colour; the juice is very yellow, which flows out where either the leaf or stalk is broken; the stalks are divided upward into many horizontal branches, each being terminated by a large umbel of yellow flowers. These appear in *July*, and are succeeded by plain seeds which are bordered, and a little convex in the middle, which ripen in the autumn. The Opopanax of the shops, is thought to be the concrete juice of this plant.

PASTURE.

Pasture ground is of two sorts: the one is low meadow land, which is often overflowed, and the other is upland, which lies high and dry. The first of these will produce a much greater quantity of Hay than the latter, and will not require manuring or dressing so often; but then the Hay produced on the upland is much preferable to the other, as is also the meat which is fed in the upland more valued than that which is fatted in rich meadows; though the latter will make the fatter and larger cattle, as is seen by those which are brought from the low rich lands in *Lincolnshire*. But where people are nice in their meat, they will give a much larger price for such as hath been fed on the downs, or in short upland pasture, than for the other. Besides this, dry pastures have an advantage over the meadows, that they may be fed all the winter, and not so subject to poach in wet weather; nor will there be so many bad weeds produced, which are great advantages, and do, in a great measure, recompence for the smallness of the crop.

The first improvement of upland pasture is, by fencing it, and dividing it into small fields of four, five, six, eight, or ten acres each, planting timber trees in the hedge rows, which will screen the Grass from the drying pinching winds of *March*, which prevent the Grass from growing in large open lands; so that if *April* proves a cold dry month, the open land produces very little Hay; whereas in the sheltered fields the Grass will begin to grow early in *March*, and will cover the ground, and prevent the sun from parching the roots of the grass, whereby it will keep growing, so as to afford a tolerable crop, if the spring should prove dry. But

in fencing of land it must be observed (as was before directed) not to make the inclosures too small, especially where the hedge rows are planted with trees; because when the trees are advanced to a considerable height, they will spread over the land; and, where they are close, will render the Grass sour; so that instead of being an advantage, it will greatly injure the pasture.

The next improvement of upland pastures is, to make the turf good, where either from the badness of the soil, or for want of proper care, the Grass hath been destroyed by Rushes, bushes, or mole hills. Where the surface of the land is clayey and cold, it may be improved by paring it off, and burning it in the manner before directed, under the article of LAND; but if it is a hot sandy land, then chalk, lime, marle, or clay, are very proper manures to lay upon it; but this should be laid in pretty good quantities, otherwise it will be of little service to the land.

If the ground is over-run with bushes or Rushes, it will be a great advantage to the land, to grub them up toward the latter part of the summer; and after they are dried to burn them, and spread the ashes over the ground just before the autumnal rains: at which time the surface of the land should be levelled, and sown with Grass seed, which will come up in a short time, and make good Grass the following spring. So also where the land is full of mole-hills, these should be pared off, and either burnt for the ashes, or spread immediately on the ground, when they are pared off, observing to sow the bare patches with Grass seed, just as the autumnal rains begin.

Another improvement of upland pastures is the feeding of them every other year; for where this is not practised, the land must be manured at least every third year; and where a farmer hath much arable land in his possession, he will not care to part with his manure to the pasture. Therefore every farmer should endeavour to proportion his pasture to his arable land, especially where manure is scarce, otherwise he will soon find his error; for the pasture is the foundation of all the profit, which may arise from the arable land.

These upland pastures seldom degenerate the Grass which is sown on them, if the land is tolerably good; whereas the low meadows, which are overflowed in winter, in few years turn to a harsh rushy Grass, but the upland will continue a fine sweet Grass for many years without renewing.

There is no part of husbandry, of which the farmers are in general more ignorant, than that of the pasture; most of them suppose, that when an old pasture is ploughed up, it can never be brought to have a good sward again; so their common method of managing their land after ploughing, and getting two or three crops of Corn is, to sow with their crop of Barley, some Grass seeds (as they call them); that is, either the red Clover, which they intend to stand two years after the Corn is taken off the ground, or Rye Grass mixed with Trefoil; but as all these are at most but biennial plants, whose roots decay soon after their seeds are perfected, so the ground having no crop upon it, is again ploughed for Corn; and this is the constant round which the lands are employed in, by the better sort of farmers; for I have never met with one of them, who had the least notion of laying down their land to Grass for any longer continuance; therefore the seeds which they usually sow, are the best adapted for this purpose.

But whatever may have been the practice of these people, I hope to prove, that it is possible to lay down land, which has been in tillage, with Grass, in such manner as that the sward shall be as good, if not better than any natural Grass, and of as long durarion. But this is never to be expected, in the common method of sowing a crop of Corn with the

Grass seeds; for wherever this hath been practised, if the Corn has succeeded well, the Grass has been very poor and weak; so that if the land has not been very good, the Grass has scarcely been worth standing; for the following year it will produce but little Hay, and the year after the crop is worth little, either to mow or feed. Nor can it be expected it should be otherwise, for the ground cannot nourish two crops; and if there were no deficiency in the land, yet the Corn being the first, and most vigorous of growth, will keep the Grass from making any considerable progress; so that the plants will be extremely weak, and but very thin, many of them which came up in the spring being destroyed by the Corn; for wherever there are roots of Corn, it cannot be expected there should be any Grass. Therefore the Grass must be thin, and, if the land is not in good heart, to supply the Grass with nourishment, that the roots may branch out after the Corn is gone, there cannot be any considerable crop of Hay.

Therefore, when ground is laid down for Grass, there should be no crop of any kind sown with the seeds; the land should also be well ploughed, and cleaned from weeds; otherwise the weeds will come up the first, and grow so strong, as to overbear the Grass, and if they are not pulled up, will entirely spoil it. The best season to sow the Grass seeds upon dry land is about the beginning of *September*, if there is an appearance of rain; for the ground being then warm, if there happen some good showers of rain after the seed is sown, the grass will soon make its appearance, and get sufficient rooting in the ground before winter, so will not be in danger of having the roots turned out of the ground by the frost, especially if the ground is well rolled before the frost comes on, which will press it down, and fix the earth close to the roots. Where this hath not been practised, the frost has often loosened the ground so much, as to let in the air to the roots of the Grass, and done it great damage, and this has been brought as an objection to the autumnal sowing of Grass; but it will be found to have no weight, if the above direction is practised; nor is there any hazard in sowing the Grass at this season, but that of dry weather after the seeds are sown; for if the Grass comes up well, and the ground is well rolled in the end of *October* or the beginning of *November*, and repeated again the beginning of *March*, the sward will be closely joined at bottom, and a good crop of Hay may be expected the same summer. In very open exposed cold lands, it is proper to sow the seeds three weeks earlier than is here mentioned, that the Grass may have time to get good rooting, before the cold season comes on to stop its growth; for in such situations, vegetation is over early in the autumn, so the Grass being weak, may be destroyed by frost: but if the seeds are sown in *August*, and a few showers follow soon after to bring up the Grass, it will succeed much better than any which is sown in the spring, as I have several years experienced, on some places as much exposed as most in *England*. But where the ground cannot be prepared for sowing at that season, it may be performed the middle or latter end of *March*, according to the seasons being early or late; for in backward springs, and in cold land, I have often sowed the Grass in the middle of *April* with success; but there is danger in sowing late, of dry weather, and especially if the land is light and dry; for I have seen many times the whole surface of the ground removed by strong winds at that season, so that the seeds have been driven in heaps to one side of the field. Therefore whenever the seeds are sown late in the spring, it will be proper to roll the ground well soon after the seeds are sown, to settle the surface, and prevent its being removed.

The sort of seeds which are the best for this purpose, are the best sort of upland Hay seeds, taken from the cleanest pastures,

pastures, where there are no bad weeds; if this seed is sifted to clean it from rubbish, three, or at most four bushels, will be sufficient to sow an acre of land. The other sort is the *Trifolium pratense album*, which is commonly known by the names of white Dutch Clover, or white Honeyfuckle Grass. Eight pounds of this seed will be enough for one acre of land. The Grass seed shall be sown first, and then the Dutch Clover seed may be afterward sown; but they should not be mixed together, because the Clover seeds being the heaviest, will fall to the bottom, and consequently the ground will be unequally sown with them.

After the seeds are sown, the ground should be lightly harrowed to bury the seeds; but this should be performed with a short toothed harrow, otherwise the seeds will be buried too deep. Two or three days after sowing, if the surface of the ground is dry, it should be rolled with a Barley roller, to break the clods and smooth the ground, which will settle it, and prevent the seeds from being removed by the wind.

When the seeds are come up, if the land should produce many weeds, these should be drawn out before they grow so tall as to overbear the Grass; for where this has been neglected, the weeds have taken such possession of the ground, as to keep down the Grass and stave it; and when these weeds have been suffered to remain until they have shed their seeds, the land has been so plentifully stocked with them, as entirely to destroy the Grass; therefore it is one of the principal parts of husbandry, never to suffer weeds to grow on the land.

As the white Clover is an abiding plant, so it is certainly the very best sort to sow, where pastures are laid down to remain; for as the Hay seeds which are taken from the best pastures, will be composed of various sorts of Grass, some of which may be but annual, and others biennial, so when those go off, there will be many and large patches of ground left bare and naked, if there is not a sufficient quantity of the white Clover, to spread over and cover the land. Therefore a good sward can never be expected, where this is not sown; for in most part of the natural pastures, we find this plant makes no small share of the sward; and is equally good for wet and dry land, growing naturally upon gravel and clay, in most parts of *England*; which is a plain indication how easily this plant may be cultivated to great advantage, in most sorts of land throughout this kingdom.

After the ground has been sown in the manner before directed, and brought to a good sward, the way to preserve it good is, by constantly rolling the ground with a heavy roller, every spring and autumn, and in summer after rain, as hath been before directed. This piece of husbandry is rarely practised by farmers, but those who do, find their account in it, for it is of great benefit to the Grass. Another thing should also be carefully performed, which is, to cut up Docks, Dandelion, Knapweed, and all such bad weeds, by their roots, every spring and autumn; this will increase the quantity of good Grass, and preserve the pastures in beauty. Dressing of these pastures every third year, is also a good piece of husbandry, for otherwise it cannot be expected the ground should continue to produce good crops. Besides this, it will be necessary to change the seasons of mowing, and not to mow the same ground every year; but to mow one season, and feed the next; for where the ground is every year mown, it must be constantly dressed, as are most of the Grass grounds near *London*, otherwise the ground will be soon exhausted.

PAVIA. Boerb. Ind. alt. 2. p. 260. The scarlet flowering Horse Chestnut.

The Characters are,

The flower has a small empalement of one leaf, indented in five

parts at the top. It has five roundish petals, waved and plaited on their borders, narrow at their base, where they are inserted in the empalement. It hath eight stamina, which are declined, as long as the petals, terminated by rising summits; and a roundish germen sitting upon an awl shaped style, crowned by an acuminated stigma. The germen afterward becomes an oval, Pear-shaped, leathery capsule with three cells, in which is sometimes one, and at others two, almost globular seeds.

There is but one Species of this genus, viz.

PAVIA. Boerb. Ind. alt. 2. p. 260. The scarlet Horse Chestnut.

This plant grows naturally in *Carolina* and the *Brazils*; from the first the seeds were brought to *England*, where the plants have been of late years much cultivated in the gardens. In *Carolina* it is but of humble growth, seldom rising more than eight or ten feet high; the stalk is pretty thick and woody, sending out several branches, garnished with hand shaped leaves, composed of five or six spear-shaped lobes, which unite at their base, where they join the foot-stalk; they are sawed on their edges, and have long foot-stalks. The flowers are produced in loose spikes at the end of the branches, standing upon long naked foot-stalks, which sustain five or six flowers, which are tubulous at bottom, but spread open at the top, where the petals are irregular in size and length, having an appearance of a lip flower; they are of a bright red colour, and have seven or eight stamina the length of the petals. When the flowers fade, the germen swells to a Pear-shaped fruit, with a thick russet cover having three cells, one of which, and sometimes two, are pregnant with globular seeds.

It may be propagated by sowing the seeds in the spring, upon a warm border of light sandy earth; and when the plants come up, they should be carefully cleared from weeds, but they must not be transplanted until the spring following; for as these seedling plants are tender while they are young, so they should be covered with mats the two first winters: this should be carefully performed in autumn, when the early frosts begin; for as the tops of the young plants are very tender, so a small frost at that time will pinch them; and when the tops are killed, they generally decay to the ground; when this happens, they seldom make good plants after. Therefore this should be constantly observed for two years, or three at most, by which time the plants will have gotten strength enough to resist the frost, when they should be removed just before they begin to shoot, and placed either in a nursery to be trained up, or where they are to remain; observing, if the season be dry, to water them until they have taken root, as also to lay some mulch upon the surface of the ground, to prevent the sun and wind from drying it too fast; as the plants advance, so the lateral branches should be pruned off, in order to reduce them to regular stems.

This tree may be propagated by budding or grafting it upon the common Horse Chestnut, which is the common method practised by the nursery-men; but the trees thus raised, seldom make a good appearance long, for the stock of the common Horse Chestnut will be more than twice the size of the other, and frequently put out shoots below the graft, and sometimes the grafts are blown out of the stocks, after ten years growth; but these stocks render the trees hardy, and of a larger growth.

PAULLINIA. Lin. Gen. Plant. 446.

The Characters are,

The flower has a permanent empalement, composed of four small oval leaves. It hath four oblong oval petals, twice the size of the empalement, and eight short stamina, with a turbinated germen, having three short slender styles, crowned by spreading stigmas. The germen afterward turns to a large three-cornered capsule with three cells, each containing one almost oval seed.

The

The Species are,

1. PAULLINIA *foliis ternatis, petiolis teretiusculis, foliolis ovato-oblongis*. *Lin. Sp. Plant.* 365. Three-leaved Paullinia with taper foot-stalks, and oblong oval lobes.

2. PAULLINIA *foliis biternatis, petiolis marginatis, foliolis ovatis integris*. *Lin. Sp. Plant.* 366. Paullinia with nine lobes in each leaf, bordered foot-stalks, and oval entire lobes.

3. PAULLINIA *foliis ternatis, foliolis cuneiformibus, obtusis subdentatis*. *Lin. Sp. Plant.* 365. Three-leaved Paullinia, with trifoliate leaves having wedge-shaped lobes, which are indented.

4. PAULLINIA *foliis biternatis, foliolis ovatis subsinuatis*. *Lin. Sp. Plant.* 366. Paullinia with double trifoliate leaves, having oval sinuated lobes.

5. PAULLINIA *foliis pinnatis, foliolis incis, petiolis marginatis*. *Hort. Cliff.* 52. Paullinia with winged leaves whose lobes are cut, and bordered foot-stalks.

6. PAULLINIA *foliis ternatis, foliolis ovatis subdentatis, petiolis marginatis*. *Burm.* Three-leaved twining Cururu.

7. PAULLINIA *foliis pinnatis tomentosis, foliolis ovatis incis, petiolis marginatis*: Paullinia with winged woolly leaves, whose lobes are oval, cut on their edges, and bordered foot-stalks.

8. PAULLINIA *foliis bipinnatis*. *Lin. Sp. Plant.* 366. Paullinia with double winged leaves.

9. PAULLINIA *foliis biternatis, foliolis oblongo-ovatis emarginatis, petiolis marginatis*. Paullinia with twice trifoliate leaves, whose lobes are oblong, oval, and indented at the top, and bordered foot-stalks.

These plants all grow naturally in the *West-Indies*. They have climbing stalks with tendrils at each joint, by which they fasten themselves to the neighbouring trees, and rise to the height of thirty or forty feet, garnished at each joint with one leaf, which in some of the species is composed of three lobes like Trefoil, in others of five lobes, and some have nine lobes. These are in some species entire, in others they are indented at the point, and some are cut on their edges; in some species their surface is smooth, in others they are hairy. The flowers come out in long bunches like those of Currants, they are small and white, so make no figure; these are succeeded by three-cornered capsules having three cells, which in the Cururu of *Plumier*, contain roundish seeds, but those of the Serjana have winged seeds like those of the Maple reversed, being fastened at the extremity of the wing to the capsule, the seed hanging downward.

As these plants are so tender as not to live through the winter in *England*, unless they are placed in a warm stove, and requiring a large share of room, they are seldom propagated in *Europe*, unless in botanick gardens for the sake of variety, for their flowers have very little beauty to recommend them.

PEACH. See *Perfica*.

PEAR. See *Pyrus*.

PEAS. See *Pisum*.

PEAS EVERLASTING. See *Lathyrus*.

PEDICULARIS, Rattle, Cocks Comb, or Lousewort.

There are four different kinds of this plant, which grow wild in pastures in several parts of *England*, and in some low meadows are very troublesome weeds, especially one sort with yellow flowers, which rises to be a foot high, or more, and is often in such plenty as to be the most predominant plant; but this is very bad food for cattle, and when it is mowed with the Grass for Hay, renders it of little value. The seeds of this plant are generally ripe by the time the Grass is mowed, so that whenever persons take Grass seed for sowing, they should be very careful, that none of this seed is mixed with it. As these plants are never cultivated, I shall not trouble the reader with their several varieties.

PEGANUM. *Lin. Gen. Plant.* 530. Wild *Assyrian Rue*.

The Characters are,

The flower has a permanent empalement. It has five oblong oval petals, which spread open, and fifteen awl-shaped stamina about half the length of the petals, whose bases spread into a nectarium under the germen, and are terminated by erect oblong summits. It has a three-cornered roundish germen, elevated at the base of the flower, which afterward becomes a roundish three-cornered capsule, having three cells filled with oval acute-pointed seeds.

We have but one Species in the *English* gardens at present, *viz.*

PEGANUM *foliis multifidis*. *Hort. Upsal.* 144. Peganum with many-pointed leaves.

This plant grows naturally in *Spain* and *Syria*; it has a root as large as a man's little finger, which by age becomes woody. The stalks decay every autumn, and new ones arise in the spring; these grow about a foot long, and divide into several small branches, which are garnished with oblong thick leaves cut into several narrow segments; they are of a dark green, and of a gummy bitterish taste. The flowers are produced at the end of the branches, sitting close between the leaves, and are composed of five roundish white petals, which open like a Rose, having fifteen awl-shaped stamina. In the center is situated a roundish three-cornered germen, which afterward becomes a roundish three-cornered capsule, having three cells, which contain several oval acute-pointed seeds.

It is propagated by seeds, which should be sown thinly on a bed of light earth, the beginning of *April*, and when the plants come up, they must be constantly kept clean from weeds, which is all the culture they will require till the end of *October*, or the beginning of *November*, when their stalks decay. At which time, if the bed is covered with tanners bark, ashes, saw-dust, or such like covering to keep out the frost, it will be a secure way to preserve the roots, which when young are somewhat tender. The following *March* the roots may be taken up, and transplanted into a warm situation and a dry soil, where they will continue several years.

PELECINUS. See *Biserrula*.

PELLITORY OF SPAIN. See *Anthemis*.

PELLITORY OF THE WALL. See *Parietaria*.

PENNY-ROYAL. See *Pulegium*.

PENTAPETES. *Lin. Gen. Plant.* 757.

The Characters are,

The flower has a double empalement, the outer being small and composed of three leaves, the inner is cut into five parts, which are reflexed. It has five oblong petals which spread open, and fifteen narrow stamina joined in a tube at their base. It has a roundish germen, with a cylindrical style the length of the stamina, crowned by a thick stigma. The germen afterward becomes an oval ligneous capsule with five cells, filled with oblong seeds.

We have but one Species of this genus at present in the *English* gardens, *viz.*

PENTAPETES *foliis hastato-lanceolatis serratis*. *Lin. Sp. Plant.* 698. Pentapetes with halberd-pointed, spear-shaped, sawed leaves.

This plant grows naturally in *India*, from whence I have several times received the seeds; it is annual, and dies in the autumn, soon after it has ripened seeds. It hath an upright stalk from two to three feet high; garnished with leaves of different forms; the lower leaves are large, and cut on their sides towards the base into two side lobes; the middle is extended two or three inches farther in length, so that the leaves resemble the points of halberds in their shape; they are slightly sawed on their edges, and are of a lucid green on their upper side, standing upon pretty long foot-stalks. The leaves, which are on the upper part of the branches, are much narrower, and some of them have very small indentures on their sides; these sit close to the stalks, and are

placed alternately. From the wings of the stalks the flowers come out; they are for the most part single, but sometimes there are two arising at the same place. The foot-stalk of the flower is short and slender. The exterior empalement of the flower is composed of three short leaves; the interior is of one leaf, cut at the top into five acute segments, and are almost as long as the petal. The flower is of one petal, cut into five obtuse segments. In the center of the flower arises a short thick column, to which adhere fifteen short stamina. Between the stamina is situated a roundish germen, supporting a style the length of the stamina, which is crowned by a thick stigma. These are all joined at their base into a sort of column. The flowers are of a fine scarlet colour, and are succeeded by roundish capsules with five cells, each cell inclosing three or four oblong seeds, which ripen in the autumn.

The seeds of this plant must be sown upon a hot bed in *March*, and when the plants are fit to transplant, there should be a new hot-bed prepared to receive them, into which should be plunged some small pots filled with good kitchen-garden earth; in each of these should be one plant put, giving them a little water to settle the earth to their roots; they must also be shaded from the sun till they have taken new root, then they should be treated in the same way as other tender exotick plants. When the plants are advanced in their growth so as to fill the pots with their roots, they should be shifted into larger, and plunged into another hot-bed, where they may remain as long as they can stand under the glasses of the bed, without being injured; afterward they must be removed either into the stove or a glass-case, where they may be screened from the cold, and in warm weather have plenty of fresh air admitted to them. With this management the plants will flower early in *July*, and there will be a succession of flowers continued till the end of *September*, during which time they make a good appearance. The seeds ripen gradually after each other in the same succession as the flowers were produced, so they should be gathered as soon as their capsules begin to open at the top.

PENTAPHYLLOIDES. See *Potentilla*.

PEONY. See *Pæonia*.

PEPO. See *Cucurbita*.

PERESKIA *Plum. Nov. Gen. 37. tab. 26. Gooseberry.*

The Characters are,

It hath a Rose-shaped flower consisting of several leaves, which are placed orbicularly, whose cup afterward becomes a soft, fleshy, globular fruit, beset with leaves. In the middle of the fruit are many fat roundish seeds inclosed in a mucilage.

We have but one Species of this plant, viz.

PERESKIA *aculeata, flore albo, fructu flavescente. Plum. Nov. Gen. 37.* Prickly Pereskia with a white flower, and a yellowish fruit.

This plant grows in some parts of the *Spanish West-Indies*, from whence it was brought to the *English* settlements in *America*, where it is called a *Gooseberry*, and by the *Dutch* it is called *Blad Apple*. It hath many slender branches, which will not support themselves, so must be supported by stakes, otherwise they will trail on the ground. The branches, as also the stem of the plant, are beset with long whitish spines, which are produced in tufts. The leaves are roundish, very thick, and succulent, and the fruit is about the size of a *Walnut*, having tufts of small leaves on it, and hath a whitish mucilaginous pulp.

It may be propagated by planting of the cuttings during any of the summer months, which should be planted in pots filled with fresh light earth, and plunged into a moderate hot-bed of tanners bark, observing to shade them from the sun in the heat of the day. In about two months the cuttings will have made good roots, when they may be carefully taken out of the pots, and each planted in a separate

pot, and plunged into the hot-bed again, where they may remain during the summer season; but at *Michaelmas*, when the nights begin to be cold, they should be removed into the stove, and plunged into the bark-bed. During the winter season, the plants must be kept warm; in summer they must have a large share of air, but they should constantly remain in the stove, for though they will bear the open air in summer, in a warm situation, yet they will make no progress, if they are placed abroad; nor do they thrive near so well in the dry stove, as when they are plunged in the tan, so that the best way is to set them next a trellace, at the back of the tan-bed, to which their branches may be fastened, to prevent their trailing on other plants. This plant has not as yet produced either flowers or fruit in *England*; but as there are several plants pretty well grown in the gardens of the curious, we may expect some of them will flower in a short time.

PERICLYMENUM. *Tourn. Inst. R. H. 608. tab. 578.* Honey-suckle.

The Characters are,

The empalement of the flower is cut into five parts sitting upon the germen. The flower is of one petal, having an oblong tube, cut at the top into five segments, which turn backward. It has five awl-shaped stamina almost the length of the petal, and a roundish germen situated below the flower, which afterward becomes an umbilicated berry with two cells, each containing one roundish seed.

The Species are,

1. PERICLYMENUM *floribus capitatis terminalibus, foliis omnibus connatis sempervirentibus.* Honey-suckle with flowers growing in heads at the end of the branches, and leaves joined round the stalk, which are ever-green; commonly called *Trumpet Honey-suckle*.

2. PERICLYMENUM *racemis lateralibus oppositis, floribus pendulis, foliis lanceolatis integerrimis.* Honey-suckle with flowers in long bunches growing opposite, hanging down, and entire spear-shaped leaves.

3. PERICLYMENUM *corymbis terminalibus, foliis ovatis verticillatis petiolatis.* Honey-suckle with round bunches of flowers at the end of the branches, and oval leaves growing in whorls, having foot-stalks.

4. PERICLYMENUM *corymbis terminalibus, foliis ovatis acutis.* Honey-suckle with round bunches of flowers terminating the branches, and oval acute-pointed leaves.

5. PERICLYMENUM *capitulis ovatis imbricatis terminalibus, foliis omnibus distinctis.* Honey-suckle with oval imbricated heads terminating the stalk, and the leaves distinct; or the *German Honey-suckle*.

6. PERICLYMENUM *floribus verticillatis terminalibus sessilibus, foliis summis connato-perfoliatis.* Hort. Cliff. 45. Honey-suckle with whorls of flowers sitting close at the ends of the branches, and the upper leaves surrounding the stalk; or *Italian Honey-suckle*.

7. PERICLYMENUM *floribus corymbosis terminalibus, foliis hirsutis distinctis, viminibus tenuioribus.* Honey-suckle with a corymbus of flowers terminating the stalks, hairy leaves growing distinct, and very slender branches; commonly called *English Honey-suckle*, or *Woodbine*.

8. PERICLYMENUM *floribus verticillatis terminalibus sessilibus, foliis connato-perfoliatis sempervirentibus glabris.* Honey-suckle with whorled flowers sitting close, terminating the stalks, and smooth ever-green leaves surrounding the stalks; or *ever-green Honey-suckle*.

The first sort grows naturally in *Virginia*, and many other parts of *North-America*, but has been long cultivated in the *English* gardens by the title of *Virginia Trumpet Honey-suckle*. Of this there are two varieties, if not distinct species, one being much hardier than the other. The old sort, which came from *Virginia*, has stronger shoots; the leaves are of

a brighter green; the bunches of flowers are larger, and deeper coloured than of the other, which came from *Carolina*. These plants have the appearance of the common Honeyfuckle, but the shoots are weaker than any of those, except the wild sort called Woodbine; they are of a purplish red colour, and smooth. The leaves are of an oblong oval shape inverted, and closely surround the stalk; of a lucid green on their upper side, but pale on their under. The flowers are produced in bunches at the end of the branches, having long slender tubes, which are enlarged at the top, where they are cut into five almost equal segments. The outside of the flower is of a bright scarlet, and the inside yellow.

These plants should be planted against walls or pales, to which their branches should be trained for support, otherwise they will fall to the ground; for they cannot be reduced to heads like many of the Honeyfuckles, because their branches are too weak and rambling, and are liable to be killed in severe winters; therefore they should be planted to a warm aspect, where they will begin to flower the latter end of *June*, and there will be a succession of flowers till the autumn. They are propagated by laying down their young branches, which will easily take root, and may be afterward treated like the Honeyfuckle.

The second sort grows naturally in *Jamaica*. This hath many slender branches, which cannot support themselves, but trail upon any neighbouring bushes. They grow eight or ten feet long, are covered with a brown bark, and garnished with spear-shaped leaves, of a lucid green on their upper side, but pale on their under, standing by pairs opposite. The flowers come out from the side of the branches at each joint; they are ranged on each side the foot-stalk in long bunches like Currants. The bunches come out opposite; the flowers are small, of a yellowish green, and are succeeded by small berries of a snow white, from whence the plant is called Snowberry Bush in *America*.

The third sort grows naturally in some of the islands in the *West-Indies*. This rises with a shrubby stalk ten or twelve feet high, sending out many slender branches, covered with a light brown bark, garnished with oval leaves, four of them coming out at each joint in whorls round the stalk; they stand upon short foot stalks, and have one strong midrib, with several veins running from the midrib to the sides. The flowers come out in round bunches at the end of the branches; they are of a deep coral colour on their outside, but of a pale red within. This was found growing in *Jamaica* by the late Dr. *Houssoun*, who brought it to *England*.

The fourth sort grows naturally in the kingdom of *Chili*; father *Feuille* found it near the city of *Conception*; it was afterward found by the late Dr. *Houssoun* growing at a little distance from *Cartagena* in *New Spain*. This hath a shrubby stalk near four inches thick, covered with a gray bark, dividing into many branches, which rise about twelve feet high, garnished with stiff leaves, placed opposite, of a lucid green on their upper side, but pale on their under. The flowers are produced in round bunches at the end of the branches; they are of a deep red colour, cut into four segments at the top. These are succeeded by oval berries the size of small Olives, inclosing a hard seed.

The branches of this shrub are used for dying a black in the *Spanish West-Indies*, which is permanent, and cannot be washed out. This dye is made with the wood of the shrub cut into small pieces, and mixed with a plant called Pangué, and a black earth called Robbo, boiling them in common water till it becomes of a proper consistence.

The three sorts last mentioned are too tender to thrive in this country without artificial heat; they are propagated by seeds, which must be procured from the countries where they naturally grow. These should be sown in pots, and plunged into a moderate hot-bed, where they may remain

till the autumn, for the plants rarely come up the first year, so the pots should be removed into the stove for the winter season, and the following spring placed on a fresh hot-bed, which will bring up the plants; when they are fit to remove, they should be each planted in a separate small pot filled with light earth, and plunged into a fresh hot-bed, shading them from the sun, till they have taken new root; after which they must be treated in the manner as other tender plants from those countries. As the plants obtain strength, they should be more hardily treated, by placing them abroad in a sheltered situation for two months or ten weeks, in the warmest part of the summer, and in the winter they may be placed in the dry stove, kept to a moderate temperature of warmth; where they will thrive, and produce their flowers in the autumn.

The fifth sort is the common *Dutch* or *German* Honeyfuckle, which has been generally supposed the same with the *English* wild sort called Woodbine, but is undoubtedly a very different species, for the shoots of this are much stronger. The plants may be trained with stems, and formed into heads, which the wild sort cannot, their branches being too weak and trailing for this purpose. The branches of this are smooth, of a purplish colour, garnished with oblong oval leaves, of a lucid green on their upper side, but pale on their under, having very short foot-stalks; they are placed by pairs, but are not joined at their base. The flowers are produced in bunches at the end of the branches, each flower arising out of a scaly cover, which cover after the flowers fade, forms an oval head, whose scales lie over each other, like those of fish. The flowers are of a reddish colour on their outside, and yellowish within, of a very agreeable odour. This sort flowers in *June*, *July*, and *August*. There are two other varieties of this species, one is called the long blowing, and the other the late red Honeyfuckle.

The sixth sort is commonly called the *Italian* Honeyfuckle. Of this there are two or three varieties, the early white Honeyfuckle is one; this is the first which flowers, always appearing in *May*. The branches of this are slender, covered with a light green bark, garnished with oval leaves of a thin texture, placed by pairs sitting close to the branches, but those which are situated toward the end of the branches, join at their base, so that the stalk seems as if it came through the leaves. The flowers are produced in whorled bunches at the end of the branches; they are white, and have a very fragrant odour, but are of short duration, so that in about a fortnight they are entirely over, and soon after the leaves appear as if blighted and sickly, making an indifferent appearance the whole summer, which has rendered them less valued than the others. The other variety is the yellow *Italian* Honeyfuckle, which is the next in succession to the white. The shoots of this are much like those of the former, but have a darker bark; the leaves are also of a deeper green; the flowers are of a yellowish red, and appear soon after the white; they are not of much longer duration, and are succeeded by red berries, containing one hard seed inclosed in a soft pulp, which ripens in the autumn.

The seventh sort is the common wild *English* Honeyfuckle or Woodbine; this grows naturally in the hedges in many parts of *England*. The branches are very slender and hairy, trailing over the neighbouring bushes, and twining round the boughs of trees; the leaves are oblong, hairy, and distinct, not joined at their base; they are placed by pairs opposite; the flowers are produced in long bunches at the end of the branches. There are two varieties, one with white, and the other yellowish red flowers. These appear in *July*, and there is a succession of flowers on the plants till the autumn.

There is also a variety of this with variegated leaves, and one with cut leaves somewhat like the leaves of Oak, and one of these with variegated leaves; but, as these are accidental varieties, I have not enumerated them.

The eighth sort is supposed to grow naturally in *North America*. This hath strong branches, covered with a purple bark, which are garnished with lucid green leaves embracing the stalks, which continue their verdure all the year. The flowers are produced in whorled bunches at the end of the branches; there are frequently two, and sometimes three of these bunches rising one out of another; they are of a bright red on their outside, and yellow within, of a strong aromatic flavour. This sort begins to flower in *June*, and there is a succession of flowers till the frost puts a stop to them, so that it is the most valuable of all the sorts.

All the sorts of Honeyuckles are propagated either by layers or cuttings: when they are propagated by layers, the young shoots only should be chosen for that purpose. These should be layed in the autumn, and by the following autumn they will have taken root, when they should be cut off from the plants, and either planted where they are to remain, or into a nursery to be trained up, either for standards, which must be done by fixing down stakes to the stem of each plant, to which their principal stalk should be fastened, and all the other must be cut off; the principal stalk must be trained to the intended height of the stem, then it should be shortened, to force out lateral branches, and these should be again stopped to prevent their growing too long; by the constant repeating this as the shoots are produced, they may be formed into a sort of standard; but if any regard is had to their flowering, they cannot be formed into regular heads, for by constantly shortening their branches, the flower-buds will be cut off, so that few flowers can be expected; and as it is an unnatural form for these trees, so there should be but few of them reduced to it, for when they are planted near other bushes, in whose branches the shoots of the Honeyuckles may run and mix, they will flower much better, and have a finer appearance than when they are more regularly trained; therefore, when the plants are in the nursery, if two or three of the principal shoots are trained up to the stakes, and the others are entirely cut off, they will be fit to transplant the following autumn, to the places where they are to remain; for though they may be transplanted of a greater age, yet they do not thrive so well as when they are removed while they are young.

When these plants are propagated by cuttings, they should be planted in *September*, as soon as the ground is moistened by rain. The cuttings should have four joints, three of which should be buried in the ground, and the fourth above the surface, from which the shoots are to be produced. These may be planted in rows, at about a foot distance row from row, and four inches asunder in the rows, treading the earth close to them; and as the ever-green and late red Honeyuckles, are a little more tender than the other sorts, so if the ground between the rows where these are planted, is covered with tanners bark, or other mulch, to keep out the frost in winter, and the drying winds of the spring, it will be of great advantage to the cuttings; and if the cuttings of these sorts have a small piece of the two years wood at their bottom, there will be no hazard of their taking root. The plants which are raised from cuttings, are preferable to those which are propagated by layers, as they have generally better roots.

These plants will grow in almost any soil or situation (except the second, third, fourth, and the last mentioned, which will not thrive where they are too much exposed to the cold in winter); they thrive best in a soft sandy loam, and will retain their leaves in greater verdure in such ground, than if planted in a dry gravelly soil, where in warm dry

seasons their leaves often shrink, and hang in a very disagreeable manner; nor will those sorts, which naturally flower late in the autumn, continue so long in beauty on a dry ground, unless the season should prove moist and cold, as those in a gentle loam, not too stiff or wet.

There are few sorts of shrubs which deserve cultivation better than most of these, for their flowers are very beautiful, and perfume the air to a great distance with their odour, especially in the mornings and evenings, and in cloudy weather, when the sun does not exhale their odour, and raise it too high to be perceptible; so that in all retired walks, there cannot be too many of these intermixed with the other shrubs. I have seen these plants intermixed in hedges, planted either with Alder or Laurel, where the branches have been artfully trained between those of the hedge; from which the flowers have appeared dispersed from the bottom of the hedge to the top, and being intermixed with the strong green leaves of the plants, which principally compose the hedge, they have made a fine appearance; but the best sorts for this purpose, are the ever-green and long-blowing Honeyuckles, because their flowers continue in succession much longer than the other sorts.

PERIPLOCA. *Tourn. Inst. R. H. 93. tab. 22. Virginian Silk.*

The Characters are,

The flower hath a permanent empalement, cut into five points. The flower has one plain petal, cut into five narrow segments, with a small nectarium going round the center of the petal, and the five incurved filaments, which are not so long as the petal, with five short stamina. It has a small bisid germen with scarce any style, which afterward becomes two oblong bellied capsules with one cell, filled with seeds crowned with down, lying over each other like the scales of fish.

The Species are,

1. PERIPLOCA floribus internè hirsutis. *Lin. Sp. Plant. 211. Virginia Silk* with flowers hairy on their inside.
2. PERIPLOCA caule hirsuto. *Lin. Sp. Plant. 211. Virginian Silk* with a hairy stalk.
3. PERIPLOCA foliis oblongo-cordatis pubescentibus, floribus alaribus, caule fruticoso scandente. *Virginia Silk*, with oblong heart-shaped leaves, which are covered with soft hairs, and flowers proceeding from the sides of the stalks, which are shrubby and climbing.
4. PERIPLOCA foliis oblongo-ovatis, siliquis teretibus articulatis, caule scandente. *Virginia Silk* with oblong oval leaves, taper jointed pods, and a climbing stalk.
5. PERIPLOCA foliis ovato-lanceolatis, floribus terminalibus, siliquis articulatis, caule fruticoso scandente. *Virginia Silk* with oval spear-shaped leaves, flowers terminating the stalks, taper jointed pods, and a shrubby climbing stalk.
6. PERIPLOCA foliis lanceolatis acuminatis, floribus umbellatis axillaribus, caule fruticoso scandente. *Virginia Silk* with spear-shaped acute-pointed leaves, flowers growing in umbels from the sides of the stalks, and a shrubby climbing stalk.
7. PERIPLOCA foliis subcordatis obtusis, internè incanis, caule hirsuto scandente. *Virginia Silk*, with heart-shaped obtuse leaves, which are hoary on their under side, and a hairy climbing stalk.

The first sort grows naturally in *Syria*, but is hardy enough to thrive in the open air in *England*. It hath twining shrubby stalks, covered with a dark bark, which twist round any neighbouring support, and will rise more than forty feet high, sending out slender branches from the side, which twine round each other, and are garnished with oval spear-shaped leaves near four inches long, and two broad in the middle, of a lucid green on their upper side, but pale on their under, standing by pairs, upon short foot-stalks. The flowers come out toward the end of the small branches in bunches; they are of a purple colour, and hairy on their inside,

inside, composed of one petal, cut into five segments almost to the bottom, which spread open in form of a star, and within is situated a nectarium, which goes round the five short stamina and germen, which is hairy. The germen afterward turns to a double long taper pod or capsule, filled with compressed seeds, lying over each other like the scales of fish, having a soft down fixed to their top. This plant flowers in *July* and *August*, but rarely ripens its seeds in *England*.

It is easily propagated by laying down of the branches, which will put out roots in one year, and may then be cut from the old plant, and planted where they are to remain. These may be transplanted either in autumn, when their leaves begin to fall, or in the spring before they begin to shoot, and must be planted where they may have support, otherwise they will trail on the ground, and fasten themselves about whatever plants are near them.

The second sort grows naturally in *Africa*. This hath many slender stalks, which twine about each other, or any neighbouring support, and will rise near three feet high, putting out several small side branches, which are hairy, as are also the leaves, standing by pairs upon very short foot-stalks. The flowers come out in small bunches from the side of the stalks; they are small, of a worn-out purplish colour, and of a sweet scent, being cut into five narrow segments almost to the bottom. It flowers in the summer months, but does not produce seeds here. There is a variety of this with smooth leaves and stalks, from the same country.

The third sort was discovered by the late Dr. *Houfoun*, growing naturally at *La Vera Cruz* in *America*. This rises with a strong woody stalk to the height of five or six feet, covered with a gray bark, putting out many weak branches, which twist themselves about any neighbouring support, and rise to the height of twenty feet; they are garnished with heart-shaped leaves, of a yellowish green, covered with silky hairs, which are soft to the touch, and stand by pairs upon pretty long foot-stalks. The flowers come out in small bunches from the wings of the leaves; they are small, white, and of the open bell-shape; these are succeeded by swelling taper pods, filled with seeds crowned with long feathery down.

The fourth sort grows naturally at *Campeachy*. This hath slender, shrubby, climbing stalks, which fasten round the neighbouring trees, and rises to the height of thirty feet, covered with a purplish bark, garnished with oblong oval leaves, of a lucid green, and pretty thick texture; these stand upon short foot-stalks opposite. The flowers are in small bunches, standing upon very long foot-stalks; they are white, and are succeeded by very slender taper pods, near a foot long, having small swelling joints an inch apart; in each of these are lodged three or four flat oval seeds, with a plume of down on their top.

The fifth sort grows naturally in *Jamaica*. This hath shrubby climbing stalks like the former, which twine about the neighbouring trees, and rise ten or twelve feet high, putting out a great number of small branches, which are garnished with oval spear shaped leaves, of a lucid green, standing on short foot-stalks opposite. The flowers are produced at the end of the branches, three or four together, upon the same short foot-stalk; these have a short tube, which is cut into five segments at the top, which spread open; they are yellow, and are succeeded by slender pods between four and five inches long, which have swelling joints where the seeds are lodged, and a brown feathery down on their top. The joints of these pods do not swell so much as those of the other, nor are the spaces between the joints so slender.

The sixth sort grows naturally in *Jamaica*. This hath

slender climbing stalks covered with a green bark, which twine about the neighbouring trees, and rise thirty feet high; the joints are far asunder; at each are placed two spear-shaped leaves opposite, standing upon short foot-stalks, of a light green, ending in acute points. The flowers come out from the side of the stalks in a sort of umbel, standing upon foot-stalks between two and three inches long; they are of a pure white, and smell very sweet, and are cut into five segments almost to the bottom; these are succeeded by taper pods about two inches long, ending in acute points, filled with oblong seeds, crowned with long down.

The seventh sort grows naturally at the *Cape of Good Hope*. This hath very slender twining stalks, which twilt about each other, and any of the neighbouring plants, rising four or five feet high; they are hairy, garnished with leaves almost heart-shaped, hoary on their under side, but of a lucid green on the upper, standing by pairs on short foot-stalks. The flowers come out in clusters from the side of the stalk; they are small, and cut into five segments, which spread open flat; they are of a worn out purple colour, and have a strong sweet scent. These appear in *July* and *August*, but are not succeeded by seeds in *England*.

The second and last mentioned sorts are hardy enough to thrive in this country, with a little protection from the frost in winter. If these are sheltered under a common frame, or placed in a green-house during the winter season, and placed abroad with other hardy exotic plants in summer, they will thrive and flower very well; but as all the plants of this genus have a milky juice, so they should not have much wet, especially in cold weather, lest it rot them. They are easily propagated by laying down of their branches, which in one year will be rooted enough to transplant; these should be planted in a light sandy loam not rich, and the pots must not be too large, for when they are over-potted they will not thrive.

The third, fourth, fifth, and sixth sorts, are tender; these will not thrive in *England*, unless they are placed in a warm stove. They may be propagated by laying down of their branches, in the same manner as the former; or from seeds, when they can be procured from the places where they naturally grow. These should be sown upon a good hot-bed, and when the plants come up, they must be treated in the same manner as other tender exotic plants.

If these plants are constantly kept plunged in the tan-bed of the stove, they will thrive and flower much better than in any other situation, but the stove should not be kept too warm in winter; and in the summer, the plants should have a large share of free air admitted to them; for when they are kept too close, their leaves will be covered with insects, and the plants will become sickly in a short time.

PERIWINKLE. See *Vinca*.

PERSEA. *Plum. Nov. Gen. 44. tab. 20.* The Avocado, or Avogato Pear.

The Characters are,

The flower hath no calicement, but is composed of six petals, ending in acute points, which spread open. It hath six stamina, about half the length of the petals, terminated by roundish summits, and a short style crowned by a pyramidal germen, which afterward becomes a large fleshy pyramidal fruit, inclosing an oval seed, having two lobes.

We know but one Species of this plant, viz.

PERSEA. *Clas. Hist.* The Avocado, or Avogato Pear.

This tree grows in great plenty in the *Spanish West-Indies*, as also in the island of *Jamaica*, and hath been transplanted into most of the *English* settlements in the *West-Indies*, on account of its fruit; which is not only esteemed by the inhabitants as a fruit to be eaten by way of dessert, but is very necessary for the support of life. The fruit of itself is very insipid, for which reason they generally eat it with the juice

of Lemons and sugar, to give it a piquancy. It is very nourishing, and is reckoned a great incentive to venery. Some people eat this fruit with vinegar and pepper.

This tree, in the warm countries where it is planted, grows to the height of thirty feet or more, and has a trunk as large as our common Apple trees; the bark is smooth, and of an Ash colour; the branches are beset with pretty large, oblong, smooth leaves, like those of Laurel, which are of a deep green colour, and continue on the tree throughout the year. The flowers and fruit are, for the most part, produced toward the extremity of the branches. The fruit is as large as one of the largest Pears, inclosing a large seed with two lobes included in a thin shell.

In *Europe* this plant is preserved as a curiosity, by those persons who delight in collecting exotick plants; and though there is little hope of its producing fruit, yet for the beauty of its shining green leaves, which continue through the winter, it deserves a place in every curious collection of plants.

It is propagated by seeds, which should be obtained as fresh as possible, from the countries of its growth; and if they are brought over in sand, they will be more likely to grow, than such as are brought over dry. These nuts or seeds should be planted in pots, filled with light earth, and plunged into a hot-bed of tanners bark. In about five or six weeks the plants will come up, when they must, while young, be treated very tender; but when they have grown about four inches high, they should be carefully transplanted; and if there are two or more plants in one pot, they must be parted, being careful to preserve a ball of earth to the root of each, and planted into separate small pots, then plunged into a hot-bed of tanners bark, observing to shade them until they have taken new root; after which time they should have fresh air admitted to them, in proportion to the warmth of the season. Towards *Michaelmas* the plants must be removed into the stove, and plunged into the bark-bed, where, during the winter season, they would be kept warm, and must be gently watered twice a week. In the spring the plants should be shifted into pots a size larger than the former, and the bark-bed should be then renewed with fresh tan, which will set the plants in a growing state early, whereby they will make a fine progress the following summer. These plants should be kept in the stove, for they are too tender to bear the open air in this country, except in the warmest part of summer.

PERSICA. *Tourn. Inst. R. H. 624. tab. 402.* The Peach-tree.

The Characters are,

The flower has a tubulous empalement of one leaf, cut into five obtuse segments. It hath five oblong obtuse petals, which are inserted in the empalement, and about thirty erect slender stamina, which are shorter than the petals, and are also inserted in the empalement. In hath a roundish hairy germen, which afterward becomes a roundish, woolly, large, succulent fruit, with a longitudinal furrow, inclosing an oval nut with a netted shell, having many punctures.

There are a great variety of these trees cultivated in the gardens of those who are curious in collecting the several sorts of fruit: I shall therefore first beg leave to mention only two or three sorts, which are cultivated for the beauty of their flowers; after which, I shall enumerate the several varieties of good fruit which have come to my knowledge.

1. PERSICA vulgaris, flore pleno. *Tourn. Inst. R. H. 625.* Common Peach-tree with double flowers.

2. PERSICA Africana nana, flore incarnato simplici. *Tourn. Inst. R. H. 625.* Dwarf Almond with single flowers, vulgò.

3. PERSICA Africana nana, flore incarnato pleno. *Tourn. Inst. R. H. 625.* Double flowering Dwarf Almond, vulgò.

The first of these trees is a very great ornament in a gar-

den early in the spring, the flowers being very large, double, and of a beautiful red or purple colour. This may be planted in standards, and, if intermixed amongst other flowering trees of the same growth, makes a very agreeable variety; or it may be planted against the walls of the pleasure-garden, where the beautiful appearance of its flowers early in the spring will be more acceptable in such places than the choicest fruits, which must be exposed to servants, and others, so that they seldom can be preserved in large families until they are ripe. This tree may be propagated by budding it on the Almond or Plum stocks, in the same manner as the other sort of Peaches, and should be planted in a good fresh soil that is not over moist.

The other two sorts are of humbler growth, seldom rising above three or four feet high; these may be budded upon Almond stocks, or propagated by layers; they will also take upon Plum stocks, but they are very apt to canker, after they have stood four or five years upon those stocks, especially that with double flowers, which is tenderer than the other, which sends out suckers from the root, whereby it may be propagated in great plenty.

These shrubs make a very agreeable variety amongst low flowering trees, in wilderness walks. The single sort flowers in the beginning of *April*, and the double is commonly a fortnight later.

I shall now proceed to mention the several sorts of good Peaches which have come to my knowledge; and though perhaps a greater number of sorts may be found in some catalogues of fruits, yet I doubt whether many of them are not the same kinds called by different names; for, in order to determine the various kinds, it is necessary to observe the shape and size of the flowers, as well as the different parts of the fruit; for this does sometimes determine the kind, when the fruit alone is not sufficient; besides, there is a vast difference in the size and flavour of the same Peach, when planted on different soils and aspects; so that it is almost impossible for a person who is very conversant with these fruits to distinguish them, when brought from various gardens.

1. The white Nutmeg (called by the *French*, *L'Avant Pêche Blanche*). This tree has sawed leaves, but generally shoots very weak, unless it is budded upon an Apricot stock; the flowers are large and open, the fruit is small and white, as is also the pulp at the stone, from which it separates; it is a little musky and sugary, but is only esteemed for its being the first sort ripe. It is in eating the end of *July*, and soon becomes mealy.

2. The red Nutmeg (called by the *French*, *L'Avant Pêche de Troyes*). This tree has sawed leaves; the flowers are large and open; the fruit is larger and rounder than the white Nutmeg, and is of a bright vermilion colour; the flesh is white, and very red at the stone; it has a rich musky flavour, and parts from the stone. This Peach is well esteemed; it ripens the beginning of *August*.

3. The early or small Mignon (called by the *French*, *La Double de Troyes*, or *Mignonette*). This tree has small contracted flowers; the fruit is of a middling size, and round; it is very red on the side next the sun; the flesh is white, and separates from the stone, where it is red; the juice is vinous and rich. It is ripe the beginning of *August*.

4. The yellow Alberge. This tree has smooth leaves; the flowers are small and contracted; the fruit is of a middling size, somewhat long; the flesh is yellow and dry; it is seldom well flavoured, but should be perfectly ripe before it is gathered, otherwise it is good for little. It is ripe early in *August*.

5. The white *Magdalen*. This tree has sawed leaves; the flowers are large and open; the wood is generally black at the pith; the fruit is round, of a middling size; the flesh

is white to the stone, from which it separates; the juice is seldom high flavoured; the stone is very small. This ripens early in *August*.

6. The early Purple (called by the *French*, *La Pourprée bâtive*). This tree has smooth leaves; the flowers are large and open; the fruit is large, round, and of a fine red colour; the flesh is white, but very red at the stone; is very full of juice, which has a rich vinous flavour, and is by all good judges esteemed an excellent Peach. This is ripe the middle of *August*.

7. The large or *French Mignon*. The leaves of this tree are smooth; the flowers are large and open; the fruit is a little oblong, and generally swelling on one side; it is of a fine colour; the juice is very sugary, and of a high flavour; the flesh is white, but very red at the stone, which is small. This is ripe in the middle of *August*, and is justly esteemed one of the best Peaches; it separates from the stone. This sort of Peach is tender, and will not thrive on a common stock, so is generally budded upon some vigorous shooting Peach, or an Apricot, by the nursery-men, which enhances the price of the trees. But the best method is to bud this Peach into some old healthy Apricot, which is planted to a south or south east aspect, and to cut away the Apricot when the buds have taken, and made shoots: upon some trees which I have seen thus managed, there has been a much greater quantity of fairer, and better flavoured fruit, than I have ever observed in any other management, and the trees have been much more healthy.

8. The *Chevreuse*, or *Belle Chevreuse*. This tree has smooth leaves; the flowers are small and contracted; the fruit is of a middling size, a little oblong, of a fine red colour; the flesh is white, but very red at the stone, from which it separates; it is very full of a rich sugary juice, and ripens toward the end of *August*. This is a very good bearer, and may be ranged with the good Peaches.

9. The red *Magdalen* (called by the *French* about *Paris*, *Madeleine de Courson*). The leaves of this tree are deeply sawed; the flowers are large and open; the fruit is large and round, of a fine red colour; the flesh is white, but very red at the stone, from which it separates; the juice is very sugary, and of an exquisite flavour. It is ripe the end of *August*, and is one of the best sort of Peaches.

10. The early *Newington* (or *Smith's Newington*). This is very like, if not the same, with what the *French* call *Le Pavie blanc*. This tree has sawed leaves; the flowers are large and open; the fruit is of a middling size, of a fine red on the side next the sun; the flesh is firm and white, but very red at the stone, to which it closely adheres. It hath a sugary juice, and is ripe the end of *August*.

11. The *Montauban*. This tree has sawed leaves; the flowers are large and open; the fruit is of a middling size, of a deep red, inclining to purple next the sun, but of a pale colour toward the wall; the flesh is melting and white to the stone, from which it separates; the juice is rich, and the tree is a good bearer. It ripens the middle of *August*, and is well esteemed.

12. The *Malta* (which is very like, if not the same, with the *Italian Peach*). This tree has sawed leaves; the flowers are large and open; the fruit is of a middling size, of a fine red next the sun; the flesh is white and melting, but red at the stone, from which it separates; the stone is flat and pointed; the tree is a good bearer. This ripens the end of *August*.

13. The *Noblest*. This tree has sawed leaves; the flowers are large and open; the fruit is large, of a bright red next the sun; the flesh is white and melting, and separates from the stone, where it is of a faint red colour; the juice is very rich in a good season. It ripens the end of *August*.

14. The *Chancellor*. The leaves of this tree are smooth; the flowers are small and contracted; the fruit is shaped somewhat like the *Belle Chevreuse*, but is rounder; the flesh is white and melting, and separates from the stone, where it is of a fine red colour; the skin is very thin, and the juice is very rich. It ripens about the end of *August*, and is esteemed one of the best sort of Peaches. This tree is very tender, and will not succeed on common stocks, so is budded twice as the *Mignon*; and if budded on Apricots, as was directed for that sort, will thrive much better than in any other method.

15. The *Bellegarde* (or as the *French* call it, the *Gallande*). This tree has smooth leaves; the flowers are small and contracted; the fruit is very large and round, of a deep purple colour on the side to the sun; the flesh is white, melting, and separates from the stone, where it is of a deep red colour; the juice is very rich. This ripens the beginning of *September*, and is an excellent Peach, but at present not very common.

16. The *Liste* (or as the *French* call it, *La petite Violette bâtive*). This tree has smooth leaves; the flowers are small and contracted; the fruit is of a middling size, of a fine Violet colour toward the sun; the flesh is of a pale yellow and melting, but adheres to the stone, where it is very red; the juice is very vinous. This ripens the beginning of *September*.

17. The *Bourdine*. This tree has smooth leaves; the flowers are small and contracted; the fruit is large, round, and of a fine red colour next the sun; the flesh is white, melting, and separates from the stone, where it is of a fine red colour; the juice is vinous and rich. This ripens the beginning of *September*, and is greatly esteemed by the curious. The tree bears plentifully, and will produce fruit in standards very well.

18. The *Rossiana*. This tree has smooth leaves; the flowers are small and contracted; the fruit is large, a little longer than the *Alberge*; the flesh is yellow, and separates from the stone, where it is red; the juice is rich and vinous. This ripens the beginning of *September*, and is esteemed a good Peach. This is the same with what some call the purple, and others the red *Alberge*, it being of a fine purple colour on the side next the sun.

19. The *Admirable*. This tree hath smooth leaves; the flowers are small and contracted; the fruit is large, round, and red on the side next the sun; the flesh is white, melting, and separates from the stone, where it is of a deep red colour; the juice is sugary and rich. This ripens the beginning of *September*. This is by some called the early *Admirable*, but is certainly what the *French* call *L'Admirable*, and they have no other of this name which ripens later.

20. The *old Newington*. This tree has sawed leaves; the flowers are large and open; the fruit is fair and large, of a beautiful red colour next the sun; the flesh is white, hard, and closely adheres to the stone, where it is of a deep red colour; the juice is very rich and vinous. This is esteemed one of the best sort of Pavies: It ripens about the middle of *September*.

21. The *Rambouillet* (commonly called the *Rumbullion*). This tree has smooth leaves; the flowers are large and open; the fruit is of a middling size, rather round than long, deeply divided by a sulcus or furrow in the middle; it is of a fine red colour next the sun, but of a light yellow next the wall; the flesh is melting, of a bright yellow colour, and separates from the stone, where it is of a deep red; the juice is rich, and of a vinous flavour. This ripens the middle of *September*, and is a good bearer.

22. The *Bellis* (which I believe to be what the *French* call *La Belle de Vitry*). The leaves of this tree are sawed; the flowers are small and contracted; the fruit is of a mid-

dle size, round, and of a pale red next the sun; the flesh is white, and adheres to the stone, where it is red; the juice is vinous and rich. This ripens in the middle of *September*.

23. The *Portugal*. This tree has smooth leaves; the flowers are large and open; the fruit is large, and of a beautiful red colour towards the sun; the skin is generally spotted; the flesh is firm, white, and closely adheres to the stone, where it is of a faint red colour; the stone is small, but full of deep furrows; the juice is rich and vinous. This ripens the middle of *September*.

24. *La Teton de Venus* (or *Venus's Breast*), so called from its having a rising like a dug, or bubbly. This tree has smooth leaves; the flowers are small and contracted; the fruit is of a middling size, resembling the Admirable, of a pale red colour next the sun; the flesh is melting, white, and separates from the stone, where it is red; the juice is sugary and rich. This ripens late in *September*.

25. *La Pourprée* (or as the *French* call it, *Pourprée tardive*, *i. e.* the late Purple). This tree has very large leaves, which are sawed; the shoots are very strong; the flowers are small and contracted; the fruit is large, round, and of a fine purple colour; the flesh is white, melting, and separates from the stone, where it is red; the juice is sugary and rich. This ripens late in *September*.

26. The *Nivette*. This tree has sawed leaves; the flowers are small and contracted; the fruit is large, somewhat longer than round, of a bright red colour next the sun, and of a pale yellow on the other side; the flesh is melting, full of a rich juice, and is very red at the stone, from which it separates. This is esteemed one of the best Peaches. It ripens in the middle of *September*.

27. The Royal (*La Royale*). This tree has smooth leaves; the flowers are small and contracted; the fruit is large, round, and of a deep red on the side next the sun, and of a paler colour on the other side; the flesh is white, melting, and full of a rich juice; it parts from the stone, where it is of a deep red colour. This ripens the middle of *September*, and, when the autumn is good, is an excellent Peach.

28. The *Perfique*. This tree has sawed leaves; the flowers are small and contracted; the fruit is large, oblong, and of a fine red colour next the sun; the flesh is melting, and full of a rich juice; it separates from the stone, where it is of a deep red colour. The stalk has a small knot upon it; this makes a fine tree, and is a good bearer. It ripens the end of *September*. Many gardeners call this the *Nivette*.

29. The monstrous Pavy of *Pomponne* (called by the *French*, *La Pavie rouge de Pomponne*). The leaves of this tree are smooth; the flowers are large and open; the fruit is very large and round, many times fourteen inches in circumference; the flesh is white, melting, and closely adheres to the stone, where it is of a deep red colour; the outside is a beautiful red next the sun, and of a pale flesh colour on the other side. This ripens the end of *October*, and, when the autumn is warm, is an excellent Peach.

30. The *Catharine*. This tree hath smooth leaves; the flowers are small and contracted; the fruit is large, round, and of a dark red colour next the sun; the flesh is white, hard, and full of a rich juice. It closely adheres to the stone, where it is of a deep red colour. It ripens the beginning of *October*, and in very good seasons is an excellent Peach, but being so very late ripe, there are not many situations where it ripens well.

31. The Bloody Peach (called by the *French*, *La Sanguinolle*). This Peach is of a middling size, of a deep red next the sun; the flesh is of a deep red quite to the stone, and from thence is, by some gardeners, called the Mulberry Peach. This fruit rarely ripens in *England*, so is not often planted, but it bakes and preserves excellently; for

which, as also the curiosity, one or two trees may be planted, where there is extent of walling.

There are some other sorts of Peaches which are kept in some of the nurseries, but those which are here enumerated, are the sorts most worth planting, and in this list the choicest only should be planted; but I shall just mention the names of those sorts omitted, for the satisfaction of the curious.

The *Sign*; the *Bourdeaux*; the *Swalch* or *Dutch*; the *Carlisse*; the *Eton*; the *Pêche de Pau*; yellow Admirable; the Double Flower. This last sort is generally planted more for the beauty of the flowers, than for the goodness of the fruit, of which some years the standard trees produce great plenty; but they are late ripe, and have a cold, watery, insipid juice. The Dwarf Peach is also preserved in some places as a curiosity. This is a very tender tree, making very weak shoots, which are very full of flower-buds. The fruit is not so large as a nutmeg, and not good, nor will the tree be of long duration, so it is not worth cultivating.

And indeed, from these thirty-one above-named, there are not above ten of them which I would advise to be planted; because, when a person can be furnished with those which are good, or has the best of the season, it is not worth while to plant any which are middling or indifferent, for the sake of variety; therefore the sorts which I should prefer, are these after-mentioned.

The early Purple; the *Grosse Mignon*; *Belle Chevreuse*; red *Magdalen*; *Chancellor*; *Bellegarde*; *Bourdine*; *Rossanna*; *Rambouillet*, and *Nivette*. These are the sorts best worth planting, and, as they succeed each other, they will furnish the table through the season of Peaches; and, where there is room, and the situation very warm, one or two trees of the *Catharine* Peach should have place, for in very warm seasons it is an excellent fruit.

The *French* distinguish those we call Peaches into two sorts, *viz.* Pavies and Peaches; those are called Peaches which quit the stone, and those, whose flesh closely adheres to the stone, are called Pavies. These are much more esteemed in *France* than the Peaches, though in *England* the latter are preferred to the former by many persons.

All the different sorts of Peaches have been originally obtained from the stones, which, being planted, produce new varieties, as do the seeds of all other fruits; so that where persons have garden enough to allow room for propagating these fruits from seeds, there is no doubt but some good sorts may be obtained; though it is true, there will be many of them good for nothing, as is the case of most fruits and flowers which are produced from seeds, amongst which there may be some valuable kinds, superior to those from whence the seeds were taken, yet there is always a great number which are little worth; but where persons are so curious as to plant the stones of these fruits, great regard should be had to the sorts; and if the fruits were permitted to remain upon the trees until they dropped off, the kernels would be fitter for planting, and more likely to grow. The best sorts for sowing are those whose flesh is firm, and cleaves to the stone; and from amongst these you should choose such as ripen pretty early, and have a rich vinous juice; from which sorts some good fruit may be expected.

These stones should be planted in autumn, on a bed of light dry earth, about three inches deep, and four inches asunder; and in the winter the beds should be covered with mulch, to protect them from the frost, which, if permitted to enter deep into the ground, may destroy them. In the spring, when the plants come up, they should be carefully cleared from weeds, which should also be observed throughout the summer. In this bed they should remain until the following spring, when they should be carefully taken up, so as not to break their tender roots, and transplanted into a nursery,

nursery, in rows three feet asunder, and one foot distant plant from plant in the rows, observing to lay a little mulch upon the surface of the ground about their roots, to prevent its drying too fast; and if the spring should prove very dry, you should give them a little water once a week, until they have taken root; after which, they should be constantly kept clear from weeds, and the ground between the rows carefully dug every spring, to loosen it so as that the tender fibres may strike out on every side.

In this nursery they may continue one or two years according to the progress they make; after which they should be transplanted where they are to remain, to produce fruit.

In removing these trees, you should observe to prune their downright roots (if they have any) pretty short, and to cut off all bruised parts of the roots, as also all the small fibres, which generally dry, and, when left upon the roots after planting again, grow mouldy and decay, so that they are injurious to the new fibres which are shot out from the roots, and very often prevent the growth of the trees; but you should by no means prune their heads, for the plants, which are produced from stones, are generally of a more spongy texture, and so more liable to decay when cut, than those which are budded upon other stocks. Besides, as these trees are designed for standards (for it is not proper to plant them against walls, until you see the produce of the fruit, to shew which of them deserve to be cultivated), so they will not require any other pruning, but only to cut out decayed branches, or such as shoot out very irregular from the sides, for more than this is generally very injurious to them.

When they have produced fruit, you will soon be a judge of their goodness, therefore such of them as you dislike, may be destroyed, but those which are good, may be propagated by inoculating them upon other stocks, which is the common method now practised to propagate these fruits, therefore I shall now proceed to treat of that more particularly; in the doing of which, I shall set down the method now commonly practised by the nursery-gardeners, and then propose some few things of my own as an improvement thereon, for such persons who are very curious to have good fruit. But first,

You should be provided with stocks of the Muscle and white Pear Plums, which are generally esteemed the two best sorts of Plums for stocks to inoculate Peaches and Nectarines upon; as also some Almond and Apricot stocks, for some tender sorts of Peaches, which will not grow upon Plum stocks. These should be all produced from the stone (as hath been already directed in the article NURSERY), and not from suckers, for the reasons there laid down. These stocks should be transplanted, when they have had one year's growth in the seed-bed, for the younger they are transplanted, the better they will succeed, and hereby they will be prevented from sending tap roots deep in the ground; for by shortening those which seem so disposed, it will cause them to put out horizontal roots. These stocks should be planted at the distance above-mentioned, *viz.* the rows three feet asunder, and one foot apart in the rows. This is wider than most nursery-men plant them, but I shall give my reasons hereafter for this.

When these stocks have grown in the nursery two years, they will be strong enough to bud; the season for which is commonly any time in *July*, when the rind will easily separate from the wood; when you should make choice of some good cuttings of the sorts of fruit you intend to propagate, always observing to take from healthy trees, and such as generally produce a good quantity of well tasted fruit; for it is very certain, that any sort of fruit may be so far degenerated, where this care is wanting, as not to be like the same kind. Besides, whenever a tree is unhealthy, the buds

taken from that tree will always retain the distemper, in a greater or less degree, according as it hath imbibed a greater or less quantity of the distempered juice. Thus, for instance, where a Peach or Nectarine tree hath been greatly blighted, so as that the shoots have grown busled, and the leaves curled up to a great degree, that distemper is seldom recovered again by the greatest care, or at least not without several years good management; for let the seasons prove ever so favourable, these trees will continually shew the same distemper, which many persons are so weak as to suppose a fresh blight; whereas in reality it is no other but the remains of the former sickness, which are spread and intermixed with all the juices of the tree, so that whatever buds are taken from such trees, will always retain a part of the distemper.

Upon the care which is taken in the choice of the buds, the whole success depends; therefore a person, who is curious to have good fruit, cannot be too careful in this particular, for, in general, no more is regarded by those nursery-men who are the most careful in propagating the several sorts of fruit trees, than the taking their buds or grafts from the true kinds of fruit trees; but there is still more care required to have sound healthy trees, especially in this of Peach and Nectarines; for if the buds are taken from young plants in the nursery, which have not produced fruit, the shoots of which are generally very strong and vigorous, these buds will have so vicious a habit, as rarely to be corrected, and brought into good order; for they will shoot more like the Willow than the Peach, the joints being extended to great a distance from each other, the shoots very gross, and the wood pithy; therefore, where the practice of taking the buds from nursery trees is long continued, there can be little hopes of the trees so raised. I would therefore recommend it to every curious person, to procure their buds from such trees as have been long growing, whose fruit are well flavoured, and the trees perfectly sound; as also never to make choice of the strongest or most luxuriant shoots of these trees, but such shoots as are well-conditioned, and whose buds grow pretty close together. For although these do not make so strong shoots the following year, as those which are taken from luxuriant branches, yet they will be better disposed to bear fruit, and will make much better trees.

The cuttings, with which you are thus to be provided, should always be taken from the trees either in a morning or evening, or else in a cloudy day; for if they are cut off when the sun is very hot, the shoots will perspire so freely, as to leave the buds destitute of moisture, which is often the cause of their miscarrying; and the sooner they are used, when cut from the trees, the better they will take. The manner of this operation being explained under the article INOCULATION, I shall not repeat in this place. The management of these trees, during their remaining time in the nursery, is likewise fully set down under that article. I shall therefore proceed to give some directions for the choice of these trees, when they are to be procured from a nursery. The first care should be to find out a person of character to deal with, on whose integrity you may depend, for having the trees of those kinds which you propose, and either see them taken up, or let some person you can confide in do it for you, because as most of the nursery-men have dealings with each other, if the person applied to has not the sort of fruit desired in his own nursery, he procures them from another; and, if the gardener from whom he gets them, is not as honest and careful as himself, it is a great chance if the trees prove to be of the right kinds.

The trees should also be chosen in the autumn, before others have drawn out the best; for those who go first to the nurseries, if they have skill, will always draw the finest plants. In the choice of the trees, you should observe the

stocks upon which they have been budded, that they are of the right sort, whether Plum or Apricot; that they are found and young; not such as had been budded the preceding year and failed, nor those which have been cut down. If the size of the stock is near that of a man's finger, it will be better, than if they are larger; these should be clear of mofs or canker. The buds should be of one year's growth only, and not such as have been cut down in the spring, and made a second shoot, nor should those trees be chosen, whose shoots are very strong and luxuriant, but such as have clean shoots of a very moderate size, whose joints are not too far asunder; and those trees which stand in the outside rows, or near the ends of the rows, where they have most air, are generally such; for, where they stand close in the nursery, their shoots are drawn up in length; their joints are much farther asunder, and their buds or eyes flat; for which reason, I have before advised the planting of the stocks at a greater distance than the nursery-men generally allow them; and if a careful discreet nursery-man would be at the trouble and expence in the raising of his Peach trees, according to this method, he would better deserve three shillings *per* tree, than one in the manner they are usually raised; for every person who is at the expence of building walls for fruit, should not think of saving a few shillings in the purchase of their trees; because, if they are bad, or not of the right kinds, there is a great loss of time and expence to no purpose, and the disappointment will be so great, after waiting three or four years, as to discourage many from making farther trials, thinking themselves liable to the same ill success.

When the trees are chosen in the nursery, the next care must be to have them carefully taken up out of the ground, so as not to break or tear the roots, nor injure their bark; for, as these trees are very apt to gum in those places where they are wounded, there cannot be too much care taken of this. If the trees are to be transported to a distant place, their roots should be closely wrapped either with Haybands, Straw, or Peas haulm, and mats sewed over these, to prevent the air from drying of their roots and branches. If the leaves of the trees are not fallen when they are taken up, they should be carefully stripped off, before the trees are packed up; for, when there are many of these left, they are very apt to heat, if they are long in their passage, and often occasion a mouldiness very hurtful to the branches.

We come next to the preparing of the ground to receive the trees. The best earth for Peach trees is such as is taken from a pasture ground, that is neither too stiff and moist, nor over dry, but of a middling nature, such as is termed hazel loam. This should be dug from the surface of the ground about ten inches deep, taking the turf with it, and should be laid in heaps eight or ten months at least; but that which is prepared one year or more is still better before it is used, that it may have the winter's frost, and summer's heat to mellow it, during which time it should be often turned, to rot the turf, and break the clods, whereby it will be rendered very light, and easy to work, and about the beginning of *September* you should carry it into the garden, and make the borders, which must be raised in height, proportionable to the moisture of the garden; if the ground is very wet, it will be advisable to lay some rubbish in the bottom of the border, to drain off the moisture, and to prevent the roots of the trees from running downward; and in this case it will be proper to make some under-drains at the bottom of the border, to convey off the superfluous moisture, which, if detained about the roots of the trees, will greatly prejudice them; then raise the border of earth at least a foot, or in very wet land two feet, above the level of the ground, so that the roots of the trees may always remain dry; but if the ground is pretty dry, the borders should not be raised

above six or eight inches higher than the surface, which will be sufficient to allow for their sinking.

As to the breadth of these borders, that cannot be too great; but they should never be less than eight feet broad, where fruit trees are planted, for when the borders are made narrow, the roots of the trees will be so confined in four or five years time, that they will seldom thrive well after. The depth of these borders should not be greater than two feet and a half; for where they are prepared to a great depth, it only entices the roots of the trees downward, which may be the cause of their future barrenness, for their roots, being got down below the influences of the sun and showers, imbibe a great quantity of crude juices, which only add to the luxuriant growth of the trees; besides, whatever fruit are produced from such trees, are not near so well tasted, as are those which grow upon those trees, whose roots lie near the surface, and enjoy the kindly benefit of the sun's heat, to correct and digest whatever crudities there may be in the earth.

Where the natural soil of the garden is shallow, and either chalk, clay, or gravel lies near the surface, these should not be dug out like pits to receive the earth for the border, as is by some practised, for this will be no better than planting the trees in tubs or cases, for their roots will be confined to these pits; so that when they are extended to the sides, and can get no farther, the trees will blight and decay; and if it is clay on the sides, the wet will be detained, as in a basin, and the earth of the border will be like mud in very wet seasons, so unfit for the roots of these trees. Therefore, whenever it so happens that the ground is of either of the sorts before-mentioned, it will be the best way to raise the borders of a proper thickness of good earth over these, rather than to sink down into them; for when the roots of the trees lie near the surface of the ground, they will extend to a great distance in search of nourishment, but if they get below the staple of the land, they can find nothing but sour crude pasture very unfit for vegetation.

Your borders being thus prepared should lie about three weeks or a month to settle, by which time the season for planting will be come, which should be performed as soon as the leaves begin to decay, that the trees may put out new roots, before the frost comes on to prevent them. Your ground being ready, and the trees brought carefully to the place, the next work is to prepare them for planting, which is to be formed in the following manner: you must shorten all the roots, and cut off smooth any broken or bruised roots, as also all the small fibres should be taken off, for the reasons before given; and where any of the roots cross each other, the worst of them must be cut out, that they may not injure the other.

Having thus prepared your trees, you should measure out their distance, which ought never to be less than twelve feet; but where the ground is very good, they should be planted fourteen feet asunder. This, I doubt not, will be thought too great a distance by many persons, especially since it is contrary to the general practice at this time; but I am satisfied, whoever shall try the experiment, will find it no more than is sufficient for these, where they are rightly managed; for if they take kindly to the soil, their branches may be so trained, as to furnish all the lower part of the wall in a few years, which is what should be principally regarded, and not, as is too often the practice, run up the shoots in height, and leave all the lower part of the tree destitute of bearing wood, so that in a few years there will not be any fruit upon the lower part of the trees; which also must be the case where they are planted too close, because there being no room to extend the branches on either side, they are obliged to lead them upright, which produces the before-mentioned ill effect.

There may be also some persons, who may think this distance too small for these trees, because Plums, Cherries, and most other sorts of fruit trees require much more room; but when it is considered that Peach and Nectarine trees produce their fruit only upon the former year's wood, and not upon spurs, as Cherries, Plums, and Pears do; therefore the shoots of these trees must be annually shortened in every part of them, to obtain bearing wood, whereby the trees may be kept in much less compass than those of other sort of fruit, and every part of the wall may be constantly supplied with bearing branches; for when the trees are planted at a great distance, the branches are often extended to such lengths, as to leave the middle of the trees naked, for there are never any good shoots produced from the old branches of these trees.

In the disposition of the trees, it will not be amiss to plant those sorts of Peaches near each other, which ripen about the same time, for by so doing the fruit may be better guarded from men and insects, and this will save a great deal of trouble in gathering of the fruit; for if a person is obliged to go from one part of the garden to another, or perhaps to look over all the walls of the garden every time the fruit is gathered, it is a great loss of time, which may be avoided by this first care in planting of the trees.

But to return to planting; after you have marked out the places where each tree is to stand, you must with your spade make a hole wide enough to receive the roots of the tree; then you should place it down, observing to turn the bud outwards, that the wounded part of the stock may be hid, and let the stem of the tree be placed about four or five inches from the wall, with its head inclining thereto; then fill in the earth with your hands, observing to break the clods, that the earth may fall in between the roots, so as no void spaces may be left about them. You should also gently shake the tree with your hands, to settle the earth down the better between the roots; then with your foot gently press down the earth about the stem, but do not tread it down too hard, which is many times a very great fault; for when the ground is inclinable to bind, the treading of it close doth often render the ground so hard, as that the tender fibres of the roots cannot strike into it, whereby the tree remains at a stand for some time, and if the earth be not loosened in time, it frequently dies; so that whenever you observe the earth of your borders to be bound, either by great rains, or from any other cause, you should with a fork loosen it again, observing always to do it in dry weather, if in winter or spring; but in summer it should be done in a moist season.

Although I have here given directions for the choice of trees from the nursery, after the usual method of planting these trees, which is that of taking such as have made one year's shoot, yet I would prefer those which were budded the preceding summer, and have made no shoot; for if the bud is sound and plump, and the bark of the stock well closed, where the bud is inserted, there will be no danger of its growing; and when the bud has made a shoot the following spring the length of five or six inches, if it is stopped by pinching off the top, it will put out lateral branches, which may be trained to the wall, and this will prevent any cutting off the head, as must be done to those trees which have had one year's growth in the nursery; for these trees do not care for those large amputations, especially some of the more tender sorts; and by this method of planting these trees in bud no time will be lost, when it is considered that the trees which have shot, must be cut down, and there is a hazard of their shooting again; therefore I am convinced from experience, that it is the best method.

After you have thus planted your trees, which have made

their shoots in the nursery, you should fasten their heads to the wall, to prevent their being shaken by the wind, which would disturb their roots, and break off the tender fibres soon after they were produced, to the no small prejudice of the trees; you should also lay some mulch upon the surface of the ground about their roots, before the frost sets in, to prevent it from penetrating the ground, which would injure, if not destroy the small fibres; but this mulch should not be layed upon the ground too early, lest it prevent the autumnal rains from penetrating to the roots.

These things being duly observed, they will require no farther care till the beginning or middle of *March*, according as the season is early or late; you must cut off the heads of the new planted trees, leaving only four or five eyes above the bud; in doing of which, you must be very careful not to disturb their roots; to prevent which, you should place your foot down close to the stem of the tree, and take fast hold of that part of the stock below the bud with one hand, to hold it steady, while with the other hand you gently slope off the head of the tree with a sharp knife at the intended place, which should always be just above an eye; this should be done in dry weather, for if there should be much rain soon after, there will be some danger that the wet will enter the wounded part, and damage the tree; nor should it be done in frosty weather, for the same reason; for that would enter the wounded part, and prevent its healing over. After you have headed the trees, you should gently loosen the earth of the borders, for the fibres of the roots to strike out; but you must be very careful in doing of this, not to injure their new roots, which would damage them; and if the mulch which was laid about their roots in autumn be rotten, you may dig it into the border at some distance from the roots of the trees; and when the dry weather comes on, you should pare off some turf from a pasture ground, which should be laid upon the surface of the border about the roots of the trees, turning the Grass downward, which will preserve a gentle moisture in the earth, better than any other sort of mulch; and this will not harbour insects, as most sorts of dung and litter do, to the no small detriment of the trees.

Those trees which are planted in bud, and have not made any shoots, should have their stocks cut down at this season just above the bud, for the buds will rarely shoot unless this is performed; and the nearer they are cut to the bud, the sooner will the head of the stock be covered by the buds; for although it may be necessary to leave a part of the stock above the bud, in those trees which are in the nursery, to which the shoots made by the buds may be fastened, to prevent their being broken by the wind, yet as these are planted against the wall, to which the shoots may be fastened, there will be no want of any part of the stock.

In watering of these new planted trees, which should not be done unless the spring proves very dry, you should observe to do it with a nozzle on the watering pot, so as to let it out in drops; for when it is hastily poured down, it causes the ground to bind; and if you water over the head of the tree, it will be of great service to it. Your waterings should not be repeated too often, nor should they be given in great quantity, both which are very injurious to new planted trees.

In the middle of *May*, when these trees will have put out several shoots six or eight inches in length, you should nail them to the wall; observing to train them horizontally, rubbing off all foreright shoots, or such as are weak, whereby those which are preserved will be much stronger; but if there are not more than two shoots produced, and those very strong, you should at the same time nip off their tops, which will cause each of them to push out two or more shoots, whereby the wall will be better supplied with branches;

you must also continue to refresh them with water in dry weather, during the whole season, otherwise they will be apt to suffer; for their roots having but little hold of the ground the first year after transplanting, if the season should prove very dry, it will greatly retard their growth, if due care be not taken to water them.

In the beginning of *October*, when you observe the trees have done shooting, you should prune them; in doing of which, you must shorten the branches in proportion to the strength of the tree; which, if strong, may be left eight inches long, but if weak, should be shortened to four or five; then you should train them horizontally to the wall (as was before directed), so that the middle of the trees may be void of branches, for that part of the tree will be easily furnished with wood afterwards; whereas, if the shoots are trained perpendicularly to the wall, those which are the strongest will draw the greatest share of the sap from the roots, and mount upwards; so that the side branches will be deprived of their nourishment and grow weaker, until they many times decay; and this is the reason, that we see so many Peach trees with one or two upright shoots in the middle, and the two sides wholly unfurnished with branches, whereby the middle of each tree cannot produce any fruit, that being filled with large wood, which never produces any bearing shoots. Nor can the two sides of the trees be regularly filled with fruitful branches, when this defect happens to them; therefore this method should be carefully observed in the training up young trees, for when they are permitted to run into disorder at first, it will be impossible to reduce them into a regular healthful state afterwards, the wood of these trees being too soft and pithy to admit of being cut down (as may be practised on many other hardy fruit trees, which will shoot out vigorously again); whereas these will gum at the places where they are wounded, and in a few years entirely decay.

The spring following, when the trees begin to shoot, you should carefully look over them, to rub off all fore-right shoots, or such as are ill placed, and train those which are designed to remain horizontally to the wall, in their due order as they are produced, for this is the principal season when you can best order the trees as you would have them; whereas, if they are neglected until *Midsummer*, as is the common practice, a great part of the nourishment will be exhausted by fore-right shoots, and other useless branches, which must afterwards be cut off; and hereby the remaining shoots will be rendered very weak, and perhaps some part of the wall be entirely unfurnished with branches; which might have been easily supplied in the beginning of *May*, by stopping some of the stronger shoots in such parts of the tree where there is a necessity for more branches; which would cause each of them to shoot out two or more side branches below the ends of the shoots, which may be guided into the vacant parts of the tree as they are produced, so as that every part may be regularly furnished with proper wood, which is the greatest beauty and excellency of wall trees; but you should always forbear stopping the shoots in summer, where there is not a necessity for branches to fill the wall; for there cannot be a greater fault committed, than that of multiplying the number of shoots, so as to cause a confusion, whereby the branches will be too weak to produce good fruit; besides, when they are too close laid in against the wall, the air is excluded from the shoots by the great number of leaves, so that they are never duly ripened; and consequently, what fruit is produced thereon, cannot be so well tasted as those which are produced upon such trees where the shoots receive all the advantages of sun and air to bring them to maturity.

In the pruning of Peach and Nectarine trees (which re-

quire the same management) the two following rules should be strictly observed, *viz.* First, That every part of the tree be equally furnished with bearing wood; and secondly, That the branches are not laid in too close to each other, for the reasons before laid down (with some others, which will be hereafter interted). As to the first, it must be observed, That all these trees produce their fruit upon the young wood, either of the preceding year, or at most, the two years shoots, after which age they do not bear; therefore the branches should be shortened so, as to cause them to produce new shoots annually in every part of the tree; which cannot be done in the ordinary method of pruning, where persons neglect their trees at the season when they are most capable of management, which is in *April*, *May*, and *June*; at which time the luxuriant growth of branches may be checked by pinching, and new shoots produced where they are wanting, by stopping the neighbouring branches; which shoots, being produced at that season, will have time enough to ripen and gain strength, before the autumn comes on; whereas all those shoots which are produced after the middle of *June*, will be crude and pithy; and though they may sometimes produce a few blossoms, yet those rarely bring fruit. Therefore those persons who only regard their wall trees at two different seasons, *viz.* the winter and *Midsummer* pruning, cannot possibly have them in good order; for when all the branches which were produced in the spring, are permitted to remain until the middle or latter end of *June* (as is the common practice), some of the most vigorous will draw the greatest part of the nourishment from the weaker branches, which, when the strong ones are taken off, will be too weak to produce fair fruit; and hereby the strength of the tree is exhausted, to nourish the useless branches which are annually cut off again; and thus are too many trees managed, and at the same time complaints made of their luxuriancy; because two or three shoots, by drawing the greatest share of the nourishment, grow very strong and woody (whereas, if the nourishment had been equally distributed to a regular quantity of branches, there would be no sign of their too great strength); but by often cutting off these vigorous branches, the trees are entirely destroyed, or at least rendered so weak as not to be able to produce fruit. It is therefore of the greatest consequence to wall trees, especially of these sorts, to go over them two or three times in the months of *April* and *May*, to rub off all irregular shoots, and to train in the branches that are left in due order to the wall, that each shoot may have an equal advantage of sun and air, both of which are absolutely necessary to ripen and prepare the wood for the next year's bearing; therefore the oftener the trees are looked over to divert them of these useless branches, from the time they first begin to shoot in the spring till the autumn, the better will the wood be ripened for the succeeding year.

And by duly observing this in summer, there will not be occasion for so much cutting, as is often practised on Peach trees, to their great injury; for their wood branches are generally soft, tender, and pithy, which, when greatly wounded, are not healed over again so soon as many other sorts of trees.

The distance which the branches of these trees should be allowed against the wall, must be proportioned to the size of the fruit or the length of the leaves; for if we observe how the branches of trees are naturally disposed to grow, we shall always find them placed at a greater or less distance, as their leaves are larger or smaller. And there is no surer guide to a curious artist than nature, from whence a gardener should always be directed in every part of his profession, since his business is to aid and assist nature, where she is not capable of bringing her productions to maturity;

or where there is room, to make considerable improvements by art; which cannot be any otherwise effected, than by gently assisting her in her own way.

But to return to pruning of these trees: The branches being carefully trained in, as before directed, in the spring and summer seasons, we come now to treat of the winter pruning, which is commonly performed in *February* or *March*. But the best season for this work is in *October*, when their leaves begin to fall, which will be early enough for their wounds to heal, before the frost comes on, so that there will be no danger of their being hurt hereby; and the branches of the trees being proportioned to the strength of the roots at that season, all the ascending sap in the spring will be employed to nourish only those useful parts of the branches which are left; whereas, if they are left unpruned till *February*, the sap in the branches being then in motion, as may be observed by the swelling of the buds, the greatest part of it will be drawn up to the extreme parts of the branches, to nourish such blossoms as must be afterwards cut off; and this may be easily known, by observing the strongest shoots at that season, when you will find the extreme buds to swell faster than most of the lower ones; for there being no leaves then upon the branches to detain the sap to nourish the lower buds, the upper ones will always draw from those below.

But suppose it were no advantage to the trees to prune them at this season (which I think no one will have reason to doubt after making the trial), but that it only succeeds as well as the spring pruning; yet there is a great advantage in doing of it in autumn, for that being a much more leisure season with gardeners than the spring, they will have more time to perform it carefully; and then they will not have too many things come together, which may require to be immediately executed; for the spring being the principal season for cropping their kitchen gardens and attending their hot-beds, if they are disengaged from the business of pruning at that time, it will be of great advantage, especially where there is a great quantity of walling. And here is also another benefit in pruning at this season, which is, the having the borders at liberty to dig and make clean before the spring, so that the garden may not appear in litter at that season.

In pruning of these trees, you should always observe to cut them behind a wood bud, which may be easily distinguished from the blossom buds, which are shorter, rounder, and more turgid than the wood buds; for if the shoot have not a leading bud where it is cut, it is very apt to die down to the next leading bud; so that what fruit may be produced above that, will come to nothing, there being always a necessity of a leading bud to attract the nourishment; for it is not sufficient that they have a leaf bud, as some have imagined, since that will attract a small quantity of nourishment, the great use of the leaves being to perspire away such crude juices as are unfit to enter the fruit. The length you should leave these branches, should be proportioned to the strength of the tree, which, in a healthy strong tree, may be left ten inches or more, but in a weak one, they should not be more than six inches; however, in this you must be guided by the position of a leading bud, for it is better to leave a shoot three or four inches longer, or cut it two or three inches shorter than we would choose to do, provided there be one of these buds, it being absolutely necessary for the future welfare of the branches; you should also cut out entirely all weak shoots, though they may have many blossom buds upon them; for these have not strength enough to nourish the fruit, so as to give it a kindly flavour, but they will weaken the other parts of the tree.

In nailing the shoots to the wall, you must be careful to place them at as equal distances as possible, that their leaves,

when come out, may have room to grow, without shading the branches too much; nor should you ever nail them upright if it can be avoided; for when they are thus trained, they are very subject to shoot from the uppermost eyes, and the lower part of the shoots will thereby become naked.

There is not any thing in the business of gardening, which has more exercised the thoughts of the curious, than how to preserve their tender sorts of fruit from being blighted in the spring of the year, and yet there has been little written upon this subject, which is worth notice: some have proposed mattresses of Straw or Reeds to be placed before the fruit trees against walls, to prevent their being blasted; others have directed the fixing horizontal shelters in their walls, to prevent the perpendicular dew or rain from falling upon the blossoms of the fruit trees, which they suppose to be the chief cause of their blighting; but both these contrivances have been far from answering the expectations of those persons who have put them in practice, as I have elsewhere shewn; therefore it may not be improper to repeat some things in this place, which I have before mentioned, in relation to this matter. And,

First, I have already said, that the blights which are so often complained of, do not always proceed from any external cause or inclemency in the season, but from a distemper or weakness in the trees; for if we observe the trees at that season, where they are most subject to what is called a blight, we shall find the branches very small, weak, and not half ripened, as also trained in very close to each other; these branches are, for the most part, full of blossom buds (which is chiefly occasioned by their want of strength). These buds do indeed open, and to persons not skilled in fruit trees, shew a great prospect of a plentiful crop of fruit; whereas the whole strength of the branches is spent in nourishing the flowers, and being unable to do more, the blossoms fall off, and the small efforts of the leaf buds are checked, so that many times the greatest part of the branches die away, and this is called a great blight; whereas at the same time it may be often observed, that some trees of a different sort, nay, even some of the same sort, which were stronger, though placed in the same soil, exposed to the same aspect, and subject to the same inclemency of air, have escaped very well, when the weak trees have appeared to be almost dead; which is a plain indication, that it proceeds from some cause within the tree, and not from any external blight. All this will therefore be remedied, by observing the foregoing directions in the pruning and management of the trees, so as never to over-burden them with branches, nor to suffer any part of the trees to exhaust the whole nourishment from the root, which will cause the other parts to be very weak; but to distribute the nourishment equally to every shoot, that there may be none too vigorous, at the same time that others are too weak; and by continually rubbing off useless or fore-right shoots as they are produced, the strength of the trees will not be spent, to nourish such branches as must be afterwards cut out, which is too often seen in the management of these trees. And,

Secondly, It sometimes happens, that the roots of these trees are buried too deep in the ground, which, in a cold or moist soil, is one of the greatest disadvantages that can attend these tender fruits; for the sap which is contained in the branches, being by the warmth of the sun put strongly into motion early in the spring, is exhausted in nourishing the blossoms; and a part of it is perspired through the wood branches, so that its strength is lost before the warmth can reach to their roots, to put them into an equal motion in search of fresh nourishment, to supply the expence of the branches; for want of which, the blossoms fall off and decay, and the shoots seem to be at a stand, until the farther

advance

advance of the warmth penetrates to the roots, and sets them in motion; when suddenly after, the trees, which before looked weak and decaying, make prodigious progress in their shoots; and before the summer is spent, are furnished with much stronger branches than those trees which have the full advantage of sun and showers, and that are more fruitful and healthy. If therefore this be the case, there is no way of helping this, but by raising up the trees, if they are young; or if they are too old to remove, it is the better way to root them out, and make new borders of fresh earth, and plant down young trees; for it is a great vexation to be at the trouble and expence of pruning and managing these trees, without having the pleasure of reaping any advantage from them, which will always be the case where the trees are thus injudiciously planted. Or,

Thirdly, This may proceed from the trees wanting nourishment, which is many times the case, where they are planted in a hard gravelly soil, in which it is the common practice to dig borders three or four feet wide, and three feet deep into the rock of gravel, which is filled with good fresh earth, into which the trees are planted, where they will thrive pretty well for two years, until their roots reach the gravel, where they are confined, as if planted in a pot; and, for want of proper nourishment, the branches continually decay every year. This cannot be helped, where the trees have been growing some years, without taking them entirely up, or by digging away the gravel from their roots, and adding a large quantity of fresh earth, that may afford them a supply of nourishment a few years longer; but trees so planted, cannot by any art be continued long in health.

But if the unfruitfulness of the trees does not proceed from any of the before-mentioned causes, and is the effect of unkindly seasons; then the best method yet known is, in dry weather, when little dew falls, to sprinkle the branches of the trees gently with water soon after the blossoming season, and while the young-set fruit is tender; which should always be done before noon, that the moisture may evaporate before the night comes on; and if in the night you carefully cover the trees with mats, canvas, or some such light covering, it will be of great service to them: however, where the trees are strong and vigorous, they are not so liable to suffer by a small inclemency, as are those which are weak; so that there will be few seasons in which there may not be hopes of a moderate quantity of fruit from them, though there should be no covering used; for where these coverings are used, if it is not performed with great care and diligence, it is much better to have no covering, but trust to the clemency of the season; for if the coverings are kept too close, or continued too long, the trees will receive more injury hereby, than from being constantly exposed; or if after they have been covered for some time, and then incautiously removed, so as to expose the trees too suddenly to the open air, they will suffer more thereby, than if they had not been covered. However, I must repeat in this place what has been before mentioned under another article, of a management which has been generally attended with success, which is, the putting up two feather-edge deal boards joined together, over the top of the trees, so as to form a penthouse to cast off perpendicular wet. These should be fixed up when the trees begin to blossom, and should remain till the fruit is well set, when they should be taken down, to admit the dew and rain to the leaves and branches of the trees, which must not be longer kept off; and where the wall is long, and exposed to currents of wind, if at the distance of forty feet from each other are fixed some cross Reed hedges, to project about ten feet from the wall; these will break the force of the wind, and prevent its destroying of the blossoms; and these may be

removed away, as soon as the danger is over. Where these things have been practised, they were generally attended with success; and as there will be no trouble of covering and uncovering in this method, after they are fixed up, there can be no danger of neglect, as very often is the case when the trouble is great, or to be often repeated.

When your fruit is set, and grown to the bigness of a small nut, you should go over the trees and thin them, leaving them at least five or six inches asunder; for when they are permitted to remain in bunches, as they are often produced, the nourishment which should be employed wholly to the fruits designed to stand, will be equally spent amongst the whole number, a great part of which must be afterwards pulled off; so that the sooner this is done, the better it will be for the remaining fruit; and if it should sometimes happen, that a part of those left, by any accident, should be destroyed, yet the remaining ones will be much the larger and better tasted for it, and the trees will gain more strength, for a moderate quantity of fruit is always preferable to a great crop; the fruit, when but few, will be much larger, better tasted, and the trees in a condition to bear well the succeeding year; whereas, when they are overcharged with fruit, it is always small, ill tasted, and the trees are generally so much weakened thereby, as not to be in a condition for bearing well for two or three years after; so that upon the whole, it is much better to have a smaller number of fruit than is commonly esteemed a crop, than to have too many, since the fruit and also the trees, are benefited thereby. The quantity of fruit to be left on large full grown trees, should never be greater than five dozen upon each; but on middling trees, three or four dozen will be enough.

If the season should prove hot and dry, it will be proper to draw up the earth round the stem of each tree, to form a hallow basin of about six feet diameter, and cover the surface of the ground in this basin with mulch; and once in a week or fortnight, according to the heat and drought of the season, pour down eight or ten gallons of water to the root of each tree; or where there is an engine, which will disperse the water in gentle easy drops like rain, if the same, or a larger quantity of water, is sprinkled all over the branches of the trees, and this, soaking down to the roots, will keep the fruit constantly growing, which will prevent their falling off the trees, as they generally do where this method is not practised; and the fruit being thus constantly nourished, will be much better tasted, and hereby the trees will be maintained in vigour; so that it is what I can from long experience recommend, as one of the most necessary things to be practised by all lovers of good fruit. But this should not be continued longer than while the fruit are growing, for afterward it will be hurtful to the trees and fruit, for a dry autumn ripens both wood and fruit better than a moist latter season.

It is a common opinion which has for some years prevailed, even among persons of good understanding, that Peach trees are not long lived, therefore should be renewed every twenty years; which is a great mistake, for I have eaten some of the finest Peaches of various kinds, from trees which had been planted above fifty years: and I am convinced by experience, that when the trees are budded upon proper stocks, carefully planted and managed, they may be continued fruitful and healthy sixty years and upward; and the fruit produced on these old trees, will be much better flavoured than any of those upon young ones; but I suppose the foundation of the above opinion was taken from the *French*, who generally bud their Peaches upon Almond stocks, which are of short duration, these seldom lasting good more than twenty years; but this being seldom practised in *England*, the case is widely different; nor indeed should we fetch our examples from that nation,

nation, where the professors of the art of gardening are at least a century behind the *English*; and, from their present disposition, seem unlikely to overtake them; for they depart from nature in almost every part of gardening, and are more pleased with introducing their little inventions of pruning and managing their fruit trees, according to their own fancy, than they are careful to draw their instructions from nature, from whence the true art is to be obtained; so that in very few instances gardeners should deviate from nature, unless it be in those particulars, where art may be practised to the greatest advantage, which is in the procuring many sorts of esculent plants and fruits, earlier and better flavoured than can be obtained without, in which the *French* are extremely deficient; and herein they trust too much to nature, and use too little art.

I must recommend the dunging of the borders for fruit trees every other year, with this caution, always to use such dung for their borders, as is well rotted, and to dig it into the borders in *November*, that the rain may wash down the salts before the spring comes on; and where the ground is very loose or sandy, it will be the best way to make use of neats dung, which is cooler than that of horses, but for cold strong land the latter is to be preferred.

If the ground is well-trenched every year about the roots, it will be of great service to them; and where the soil is subject to bind very close, if it is forked two or three times in a year to loosen the surface, it will greatly help the trees. The borders should not be crowded with any large growing plants, which will draw away the nourishment from the trees; therefore when any sort of kitchen herbs are planted on these borders, they should be only such as are of small growth, and which may be taken off early in the spring; and if this is carefully observed, the cultivating small things on these borders can do no harm, because the ground will be stirred the oftener, on account of these small crops, than perhaps it would have been, when no use was to be made of the borders. These rules which are here laid down, if properly observed, will direct any curious person how to have plenty of good fruit, as also to preserve the trees in vigour a great number of years.

PERSICARIA. *Tourn. Inst. R. H. 509. tab. 290.* Arse-smart.

The Characters are,

The flower hath no empalement. It hath one petal, which is permanent, and cut into five segments, which spread open; it has in some species five, and in others six short stamina, terminated by roundish summits, and a three-cornered germen, supporting two or three short slender styles crowned by single stigmas. The germen afterward becomes a roundish acute-pointed seed, wrapped up in the petal of the flower.

The Species are,

1. PERSICARIA *foliis lanceolatis, floribus hexandris, stylo bifido.* Arse-smart with spear-shaped leaves, flowers with six stamina, and a bifid style; Water Pepper.

2. PERSICARIA *floribus hexandris digynis, spicis ovatis oblongis, foliis lanceolatis acutis.* Arse-smart with flowers having six stamina and two styles, oblong oval spikes of flowers, and acute-pointed spear-shaped leaves; Spotted Arse-smart.

3. PERSICARIA *floribus octandris tryginis racemosis, foliis lanceolatis, caule divaricato patulo.* Arse-smart with bunches of flowers having eight stamina and three styles, spear-shaped leaves, and spreading stalks.

4. PERSICARIA *foliis ovato-lanceolatis acutis, floribus pentandris, caule erecto.* Arse-smart with oval, spear-shaped, acute-pointed leaves, flowers having five stamina, and an erect stalk.

There are several other species of this genus, some of which grow naturally in *England*, but as they are common weeds, they are not admitted into gardens, therefore it

would be to little purpose enumerating them. The two first here mentioned are troublesome weeds, the first growing in moist ground by the sides of ditches and ponds in most parts of *England*; the roots of this are perennial, and creep far in the ground, so as to overspread large tracts of land. The other is an annual plant, which grows plentifully on dunghills, and in moist ground every where; but as these two plants are used in medicine, I have mentioned them here to introduce the other. The first sort has been accounted an extraordinary plant against the stone. Mr. *Boyle* having in his book of the usefulness of experimental philosophy, given a mighty character of the distilled juice of this plant, for its virtues against that distemper.

The third sort grows naturally in *Siberia*. This hath a perennial creeping root, composed of many strong ligneous fibres. The stalks rise about three feet high, and divide into many confused branches, which are generally bent at each joint; these are garnished with narrow, spear-shaped, smooth leaves, of a light green, ending in acute points. The flowers are produced in loose spikes branching out from the end of the stalks; they are white, and of the same construction with the other species, but have eight stamina and three styles.

The seeds of the fourth sort were sent to *Europe* by Dr. *Tournefort*, who saw it first growing in the prince of *Teflis*'s garden in *Georgia*, and afterward in the garden of the *Monks* of the three churches near mount *Ararat*, but he could not learn where it grew naturally. They cultivate this plant in the gardens of *Georgia* and *Armenia*, not only for the beauty of its flowers, but also for the virtues, with which the plant is possessed, which are nearly the same with those attributed to the *European* Arse-smart.

This plant is annual, decaying with the first frosts in the autumn; it rises from the scattered seeds much better than if sown, but where it is sown, it should always be done in the autumn, soon after the seeds are ripe. The plants rise with a strong upright stalk to the height of eight or ten feet, and grow to the size of an ordinary walking stick; the lower part of the stalk becomes ligneous and tough; the joints are like those of the Reed or Cane. At each joint is placed one leaf; these stand alternately on the stalk; the lower leaves, which are the largest, are often more than a foot long, and six inches broad in the middle, lessening toward the end, and terminating in a long acute point, having a strong longitudinal midrib, with several transverse veins running from it toward the edges. The upper surface is of a bright green, a little hairy; the under of a pale green, and much more hairy; the lower leaves have pretty long foot-stalks, which are broad at their base, and half surround the stalks. The upper part of the stalk branches out into many divisions, each being terminated by two or three close spikes of purple flowers, which are seven or eight inches long, and have their points hanging downward; these flowers have no empalement according to Mr. *Ray* and others, or no petals according to *Tournefort*, the former calling the covers to the parts of generation, petals, if they are coloured, and the latter terming those covers, the empalement, where there are no other, whether they are green or coloured. This plant begins to shew its flowers toward the latter end of *July*, and continues in beauty, till the frost in the autumn puts a stop to them.

PERVINCA. See Vinca.

PETASITES. *Tourn. Inst. R. H. 451. tab. 258.* Butterbur.

The Characters are,

It hath a flower composed of several hermaphrodite florets, which are included in one common cylindrical empalement, which are tubulous or funnel-shaped, of one petal, cut into five segments at the brim; they have each five small hair-like stamina, terminated

nated by cylindrical summits, and a short germen, crowned with down, supporting a slender style crowned by a thick stigma. The germen afterwards becomes an oblong compressed seed, crowned with a hairy down.

The Species are,

1. *PETASITES thyrso ovato sessili, foliis obcordatis angulatis serratis.* Butter-bur with a short oval spike of flowers, and heart-shaped, angular, sawed leaves; common Butter-bur.

2. *PETASITES thyrso fastigiato, scapo crassissimo folioso, foliis inaequaliter serratis, pediculis tenuioribus.* Butter-bur with a close compact spike, a very thick leafy stalk, leaves unequally sawed, and slender foot-stalks; smaller Butter-bur.

3. *PETASITES foliis cordato-hastatis serratis infernè tomentosis.* Butter-bur with heart-shaped, halberd-pointed, sawed leaves, which are woolly on their under.

4. *PETASITES scapo longissimo, thyrso oblongo, pedunculis longissimis, foliis cordatis amplioribus.* Butter bur with a very long flower-stalk, an oblong spike of flowers, the longest foot-stalks, and the largest heart-shaped leaves.

5. *PETASITES scapo subnudo unifloro, foliis cordato-orbiculatis crenatis.* Butter-bur with a stalk almost naked, having one flower, and round, heart-shaped, crenated leaves.

The first here mentioned is the common Butter-bur or Pestilent Wort, which grows naturally by the side of rivers and ditches in most parts of England. This hath a root composed of large fleshy fibres, as big as a man's finger, which creep near the surface of the ground, but do not strike deep, nor have they many small fibres. From these, early in the spring, arise hollow thick stalks five or six inches high, terminated by an oval spike of purplish flowers sitting close to the stalk. Each flower is composed of four or five hermaphrodite florets, inclosed in one common empalement; these appear in March, and when they fade, are each succeeded by one compressed seed crowned with hairy down. It is never cultivated in gardens, but being a medicinal plant, I have mentioned it.

The roots of this are sudorifick, alexipharmick, and good for all kinds of fevers, and malignant, infectious, and pestilential distempers; they are cordial, preventing fainting and shortness of breath. A good quantity of this root is put into the Treacle water.

The fourth sort was found growing naturally in Oxfordshire by Mr. Jacob Bobart, gardener of the physick garden at Oxford. The flower-stalks of this are thicker, and rise more than two feet high; the spikes of flowers are a foot long; each flower stands on long foot-stalks, and the leaves of the plant are larger, and have longer foot-stalks than those of the common sort, and the flowers come later in the spring. This is kept in botanick gardens to increase the variety of plants, but is rarely admitted into any other.

The three other sorts grow naturally on the Alps and other mountainous places in Europe; they are of much less growth than either of the former, especially the fifth sort, whose leaves are small and round. The flower-stalks are not more than four inches high; they are almost naked, and sustain a single yellowish flower on the top. The others have short spikes of flowers; those of the second sort are collected in little bunches, and form a thick roundish spike, but those of the third sort are more like the first.

PETIVERIA. Plum. Nov. Gen. 50. tab. 39. Guiney Henweed.

The Characters are,

The flower hath a permanent empalement. It hath four small white petals, placed in form of a cross, which soon fall off, and six awl-shaped erect stamina, terminated by single summits. In the center is situated an oblong compressed germen, with four awl-shaped styles. The germen afterwards becomes one oblong seed, narrow at the bottom and taper, but broad, and indented at the top, resembling an inverted shield armed with the acute style, which is reflexed.

We know but one Species of this plant, viz.

PETIVERIA. Hort. Cliff. 141. commonly called Guiney Henweed.

It is a very common plant in Jamaica, Barbadoes, and most of the other islands in the West-Indies, where it grows in such plenty, as to become a very troublesome weed. The roots are strong, and strike deep in the ground; the stalks are jointed, and rise from two to three feet high, garnished with oblong veined leaves, of a deep green, placed alternately upon short foot-stalks. The flowers are produced in slender spikes at the end of the branches; they are very small, so make no figure.

In Europe this plant is preserved in the gardens of those persons, who are curious in botany; but there is little beauty in it, and having a strong rank scent upon being handled, renders it less valuable. It is propagated by seeds, which must be sown on a hot-bed early in the spring, and when the plants are come up, they should be each transplanted into a separate pot, and plunged into a moderate hot-bed to bring them forward. When they have obtained a good share of strength, they should be inured to bear the open air by degrees, into which they may be removed toward the latter end of June, placing them in a warm situation, where they may remain till autumn, when they should be removed into the stove, and in winter must have a moderate degree of warmth, otherwise they will not live in this country.

PETREA. Houfl. Gen. Nov. Lin. Gen. Plant. 682.

The Characters are,

The flower hath an empalement of one leaf, cut into five obtuse segments. It hath one petal, with a short tube, cut above into five almost equal segments, which are expanded. It hath four short stamina, situated in the tube, two of which are a little longer than the other, terminated by single summits, and four germen supporting a short style, crowned by an obtuse stigma. The germen afterwards become four seeds wrapped up in a fringed cover.

We have but one Species of this genus, viz.

PETREA frutescens foliis lanceolatis rigidis, flore racemoso pendulo. Shrubby Petrea with stiff spear shaped leaves, and flowers growing in long hanging bunches.

This plant was first discovered by the late Dr. Houfloun, growing naturally at La Vera Cruz in New Spain. It rises with a woody stalk to the height of fifteen or sixteen feet, which is covered with a light gray bark, sending out several long branches; these have a whiter bark than the stem, and are garnished with leaves at each joint, which on the lower part of the branches are placed by threes round them, but higher up they stand by pairs; they are stiff, and their surface rough; of a light green, having a strong dark midrib, with several transverse veins running from the midrib to the borders, which are entire. The flowers are produced at the end of the branches growing in loose bunches, which are nine or ten inches long, each flower standing upon a slender foot stalk about an inch long; the empalement of the flower is composed of five narrow obtuse leaves about an inch long, which are of a fine blue colour, so are much more conspicuous than the petals, which are white, and not more than half the length of the empalement. After the flower is past, the four germen in the center become so many oblong seeds wrapped up in a fringed cover.

This is propagated by seeds, which must be obtained from the places where the trees grow naturally, and these are very few good; for, from the seeds which the Dr. sent to England, there were but two plants raised, though the seeds were distributed to several persons. The seeds must be sown in a good hot-bed, and when the plants come up, they should be each planted in a separate small pot filled with light loamy earth, and plunged into a hot-bed of tanners bark, and afterwards placed in the bark bed in the stove,

rove, where they should constantly remain, and be treated like other plants of the same country.

PETROSELINUM. See Apium.

PEUCEDANUM. *Tourn. Inst. R. H.* 318. *tab.* 169. Hogs-fennel, or Sulphur-wort.

The Characters are,

It hath an umbelliferous flower. The cover of the large umbel is composed of many linear reflexed leaves. The empalement of the flower is small and indented in five parts. The petals of the great umbel are uniform. Each flower is composed of five oblong incurved petals, which are entire; they have each five hair-like stamina, with an oblong germen situated under the flower, supporting two small styles crowned by obtuse stigmas. The germen afterward turns to an oval fruit channelled on each side, splitting in two parts, containing two seeds convex on one side, compressed on the other, with three raised furrows, and a broad membraneous border indented at the top.

The Species are,

1. PEUCEDANUM *foliis tripartitis filiformibus longioribus umbellis circinatis.* Hogs-fennel with leaves which are divided by threes, and these are again divided into three linear parts.

2. PEUCEDANUM *foliis tripartitis filiformibus linearibus umbellis difformibus.* Hogs-fennel with leaves cut into three parts, which are long, slender, and have irregular umbels; Greater Italian Hogs-fennel.

3. PEUCEDANUM *foliis quinquies tripartitis filiformibus brevioribus, umbellâ maximâ.* Hogs-fennel with five leaves divided by threes, which are very slender and short, and a very large umbel.

4. PEUCEDANUM *foliis tripartitis capillaribus, caule ramossimo patulo, umbellis difformibus.* Hogs-fennel with very narrow hair-like leaves divided by threes, a very branching spreading stalk, and irregular umbels.

The first sort is said to grow naturally in England, but I have not been lucky enough to find it, though I have searched the places where it is mentioned to have been found; it grows in several parts of Germany in marshy meadows. This hath a perennial root, from which arise the foot-stalks of the leaves which are channelled; these are naked at bottom, but about four or five inches from the root branches into three smaller foot-stalks, and these again divide into three, and each of these divisions sustain three narrow leaves, which when bruised emit a strong scent like sulphur. The stalks rise near two feet high; these are channelled, and divide into two or three branches, each being terminated by a large regular umbel of yellow flowers, composed of several small umbels, which are circular.

The second sort grows naturally on the mountains, and also in the low valleys by the sides of rivers in Italy. The root of this is perennial; the foot-stalks of the leaves are large and furrowed, dividing into three small branches, which are again divided into three, and these end with three long narrow lobes or small leaves, which are much longer than those of the other sort. The stalks, which sustain the umbels, rise near three feet high, and divide toward the top into several small branches, each sustaining an umbel, composed of several smaller rays or umbels, which stand upon very long foot stalks. The flowers of this are yellow, and shaped like those of the former, but are much larger, as are also the seeds, but have the same form as the other.

The third sort grows naturally in the forest of Fontaine-bleau, and many other parts of France. It hath a strong perennial root, from which come out leaves, which branch into three divisions, and these divide again into three smaller; each of these smaller divisions are garnished with five short narrow leaves. The stalks are strong, round, and not so deeply channelled as either of the former, sustaining a very large umbel of yellow flowers, shaped like

those of the former sorts; the seeds are shorter, but of the same shape as those.

The fourth sort grows naturally on St. Vincent's rock near Bristol. This is a biennial plant, which perishes soon after it has perfected its seeds. The leaves of this sort are short and very narrow, spreading near the surface of the ground; the stalks rise near a foot high, but are branched almost from the bottom; these branches are almost horizontal, and are garnished with a few narrow short leaves, of a lucid green. Each stalk is terminated by a small umbel of flowers, which are of an herbaceous yellow colour and small. These are succeeded by small channelled seeds.

These sorts are preserved in botanick gardens for the sake of variety; they are all propagated, by seeds, which should be sown in the autumn soon after they are ripe; for those which are sown in the spring seldom succeed, or if the plants come up, it is rarely before the following spring. When the plants come up, they must be kept clean from weeds, and the autumn following they may be transplanted where they are to remain; they love a moist soil and a shady situation, but will not thrive under the drip of trees. The roots of the three first sorts will continue several years, and every year produce flowers and seeds. The fourth sort will rarely ripen seeds in a garden, so that I have been obliged to procure them from the place where it grows naturally.

PHACA. *Lin. Gen. Plant.* 798. Bastard Milk-vetch.

The Characters are,

The flower hath a tubulous empalement, cut into five small indentures at the brim. It is of the butterfly kind, having a large oval erect standard, with two oblong wings, which are shorter, and a short compressed obtuse keel. It hath ten stamina, nine of which are joined in one body, and the other stands separate. In the center is situated an oblong germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes an oblong swelling pod, whose upper suture is depressed toward the under, having one cell, containing several kidney-shaped seeds.

The Species are,

1. PHACA *caulescens pilosa, leguminibus tereti-cymbiformibus.* *Lin. Sp. Plant.* 755. Phaca with a hairy stalk, and taper boat-shaped pods.

2. PHACA *caulescens erecta glabra, leguminibus semi-ovatis.* *Lin. Sp. Plant.* 755. Phaca with an upright smooth stalk, and half oval pods.

The first sort is a native of Portugal and Spain. This has been long preserved in some curious gardens in England, but the other is more rare at present.

The roots of the first sort, which grow naturally in Portugal, will abide many years, and run very deep into the ground; but the branches decay every autumn, and the roots produce fresh stalks every spring, which will rise near four feet high, and grow ligneous. The flowers are produced in short spikes from the wings of the leaves; but unless the season proves very warm, they rarely flower in England, for which reason the plants are not much esteemed.

The second sort, which is a native of Siberia, hath smooth stalks, which do not rise so high as the former; the flowers are smaller, the pods are much shorter, and hang downwards.

Both these sorts are propagated by seeds, which should be sown in the place where the plants are to remain; for as they shoot their roots very deep into the earth, so it is very difficult to transplant them with any safety, especially after they have remained any considerable time in the seed-bed. The plants should be left about six feet asunder, that there may be room to dig the ground between them every spring, which is all the culture they require, except the keeping them clean from weeds.

PHALANGIUM. See Anthericum.

PHASEOLOIDES. See Glycine.

PHASEOLUS. *Tourn. Inst. R. H. 412. tab. 232.* Kidney-bean.

The Characters are,

The empalement of the flower is of one leaf. The flower is of the butterfly kind; it hath a heart-shaped, obtuse, inclined standard, reflexed on the sides; the wings are oval, the length of the standard, and a narrow spiral keel twisted contrary to the sun. It hath ten stamina, nine joined in one body, and the other standing separate, and an oblong, compressed, hairy germen, supporting a slender, inflexed, spiral style, crowned by an obtuse hairy stigma. The germen after-ward becomes a long pod, with a thick shell, ending in an obtuse point, inclosing oblong, compressed, kidney-shaped seeds.

It would be to little purpose to enumerate all the varieties of this plant, which have come to our knowledge in this place, since *America* does annually furnish us with so many new sorts, as that there is no knowing what varieties there may be produced in *England*: besides, as they are not likely to be much cultivated here, since some of the old sorts are preferable to any of the new ones, for the use of the kitchen-garden; therefore I shall only mention a few sorts, which are cultivated for their flowers, or as curiosities, and then mention those which are most esteemed for the table.

1. PHASEOLUS caule volubili, floribus laxè spicatis, alis longitudine vexillo. *Lin. Sp. Plant. 725.* Kidney-bean with a twining stalk, and flowers growing in loose spikes, whose wings are as long as the standard.

2. PHASEOLUS caule volubili, vexillis carinâque spiralliter convolutis. *Lin. Sp. Plant. 725.* Kidney-bean with a twining stalk, whose standard and keel are spirally twisted; commonly called Caracalla in *Portugal*.

3. PHASEOLUS caule volubili, vexillis revolutis patulis, leguminibus linearibus strictis. *Lin. Sp. Plant. 724.* Kidney-bean with a twining stalk, a spreading standard which is twisted backward, and narrow close pods.

4. PHASEOLUS caule volubili, pedunculis subcapitatis, seminibus tetragono-cylindricis pulverulentis. *Hort. Upsal. 214.* Kidney-bean with a twining stalk, foot-stalks ending in flowers growing in heads, and four-cornered, cylindrical, dust-coloured seeds.

5. PHASEOLUS caule volubili, floribus racemosis geminis, bracteis calyce brevioribus, leguminibus pendulis. *Lin. Sp. Plant. 724.* Kidney-bean with a twining stalk, branching flowers growing by pairs, bractæ which are shorter than the empalement, and hanging pods; commonly called the Scarlet-bean.

6. PHASEOLUS caule volubili, floribus racemosis, siliquis brevibus pubescentibus. Kidney-bean with a twining stalk, flowers growing in long bunches, and short hairy pods.

The first sort is an annual plant. The seeds of this were brought from *Carolina*, where it grows naturally. The stalks twine about any support, like the common Kidney-bean; they are hairy, and rise four or five feet high; the leaves are shaped like those of the common Kidney-bean, but are narrower. The flowers are produced in loose spikes, standing upon long foot stalks; they are large, and of a purple colour, turning to a blue before they fade.

The seeds of this sort should be sown on a warm border about the latter end of *April*, and when the plants begin to run up, they must be supported either with sticks, or fastened to a hedge or wall, to prevent their trailing on the ground, and constantly kept clean from weeds. If they are close to a wall or hedge, exposed to a good aspect, they will ripen their seeds in *England*, otherwise they frequently fall in bad seasons.

The second sort grows naturally in the *Brazils*. This is a perennial root with twining stalks, which rise to the height of twelve or fourteen feet; the leaves are shaped like those

of the common Kidney-bean, but are smaller. The flowers are produced in slender spikes; they are of a purplish colour, and have an agreeable odour; these are succeeded by slender pods, which are compressed, containing several oval compressed seeds. This is propagated by seeds, which should be sown in a moderate hot-bed in the spring; and when the plants come up, they must be transplanted into pots, filled with light fresh earth, and plunged into a hot-bed, to facilitate their taking root; after which they should be inured to bear the open air by degrees, into which they should be removed the end of *June* or beginning of *July*, placing them in a sheltered situation; and as they advance in their growth, and fill the pots with their roots, they should be removed into larger pots, which must be filled up with fresh light earth.

The third sort grows naturally in *America*, and is preserved in some curious gardens for variety, but is a plant of no great beauty. This may be propagated by sowing the seeds in the spring upon a hot-bed; and when they come up, they must be planted in pots, and treated as the former sort.

The fourth sort was brought from *America*, and is preserved in some curious gardens, for the sake of its long flowering. This is an abiding plant, and should be managed as was directed for the third sort, but this requires a stove to preserve it through the winter in *England*.

The fifth sort has been long cultivated in the *English* gardens for the beauty of its scarlet flowers. This hath twining stalks, which, if properly supported, will rise to the height of twelve or fourteen feet; the leaves are smaller than those of the common Kidney-bean. The flowers grow in large spikes, and are much larger than those of the common Kidney-bean, and of a deep scarlet colour; the pods are large and rough, and the seeds are purple, marked with black. This sort requires no other treatment than the common sort, but the stalks should have tall stakes put down by them to twine round, otherwise they will fall on the ground, which will soon cause them to rot.

Although this sort is chiefly cultivated for the beauty of its flowers at present, yet I would recommend it as the best sort for the table; and whoever will make trial of this, I dare say must prefer it to all the other kinds yet known.

The fifth sort grows naturally in the warmest part of *America*, so will not thrive in *England* out of a stove; and as the chief beauty of it is in the seeds, which are half scarlet, and the other half black, so these may be procured from abroad better than raised here.

I shall now mention those sorts of Kidney-beans, which are cultivated in the *English* gardens to supply the table, which are few in comparison of the number already known; though these are not many of them valuable, and are only cultivated because they require less care, or will come a little forwarder in the season, for they are inferior in taste to the others; however, as there are some persons who esteem them for their qualities before-mentioned, so I shall put them down in the order of their ripening for use.

The three sorts which are usually cultivated for early crops, are the small white Dwarf, the Dwarf black, which is called the Negro-bean, and the Liver Colour-bean. The stalks of these are never very long, so may be planted much nearer together than the larger growing kinds, and they require but little support; so these are planted on hot-beds under frames, or in pots which are placed in stoves, to come early in the spring, for which purpose they are better adapted than any of the other; but they are not to be compared with some of the others for goodness, but as they may be had at a time when the others cannot be so well obtained, so they are generally cultivated in the gardens; and where there are not the convenience of stoves or frames for raising them very early, they are planted in

warm borders near hedges, walls, or pales, where they will be fit for use a fortnight earlier than the other sorts.

The next to these are the *Battersea* and *Canterbury* Kidney-beans; these do not ramble far, and produce their flowers near the root, so bear plentifully for some time: the *Battersea* Bean is the forwarder of the two, but the other will continue bearing much longer; they are both better flavoured than either of the three former sorts, but when they begin to be large, are very stringy and tough.

There are two or three sorts of Kidney-beans cultivated with erect stalks, which want no support, as they do not put out any twining stalk. These are much cultivated by the gardeners for that reason, as also for their producing a great plenty of pods; but they are inferior in goodness to all the other, especially that sort with black and white seeds, whose pods have a rank flavour, and, when boiled, become soft and mealy, so this should never be propagated by persons of taste.

The best sorts for the table are the scarlet blossom Bean before-mentioned, and a white Bean of the same size and shape, which appears to be only a variety of the scarlet, as it differs in no other respect, but the colour of the flowers and seeds, being equal in size and flavour. And next to these is the large *Dutch* Kidney-bean, which grows as tall as either of these, so must be supported by stakes, otherwise their stalks will trail upon the ground and spoil. The sort with scarlet flowers is preferable to this in goodness, and is also hardier; and although it will not come so early as some of the dwarf kinds, yet as it will continue bearing till the frost puts a stop to it in the autumn, so it is much preferable to either of them; for the pods of this sort when old, are seldom stringy, and have a better flavour than the young pods of those sorts, and will boil greener; and where this is sown in the same situation and soil as the *Battersea* Bean, it will not be a fortnight later.

All the sorts of Kidney-beans are propagated by seeds, which are too tender to be sown in the open air before the middle of *April*; for if the weather should be cold and wet after they are in the ground, they will soon rot; or if the morning frost should happen after the plants come up, they will be destroyed; therefore the best way to have early Kidney-beans, where there is no conveniency of frames for raising them, is to sow the seeds in rows pretty close, upon a moderate hot-bed, the latter end of *March* or the beginning of *April*. If the heat of the bed is sufficient to bring up the plants, it will be enough; this bed should be arched over with hoops, that it may be covered with mats every night, or in bad weather. In this bed the plants may stand till they have put out their trifoliate leaves, then they should be carefully taken up, and transplanted in warm borders near hedges, pales, or walls. If the season proves dry at the time of removing them, the plants should be gently watered to forward their taking new root, and afterward they must be managed in the same way as those which are sown in the full ground. These transplanted Beans will not grow so strong as those which are not removed, nor will they continue so long in bearing, but they will come at least a fortnight earlier than those which are sown in the full ground.

The first crop intended for the full ground, should be put in about the middle of *April*; but these should have a warm situation and a dry soil, otherwise the seeds will rot in the ground; or if the weather should prove so favourable as to bring up the plants, yet there will be danger of their being killed by morning frosts, which frequently happen the beginning of *May*.

The second crop, which should be one of the three large sorts last mentioned, should be sown about the middle of *May*. These will come into bearing before the early kinds

are over, and if they are of the scarlet sort, will continue fruitful till the frost destroys the plants in the autumn, and these will be good as long as they last. The manner of planting them is, to draw shallow furrows with a hoe, at about three feet distance from each other, into which you should drop the seeds about two inches asunder; then with the head of a rake draw the earth over them, so as to cover them about an inch deep.

If the season be favourable, the plants will begin to appear in about a week's time after sowing, and soon after will raise their heads upright; therefore, when the stems are advanced above ground, you should gently draw a little earth up to them, observing to do it when the ground is dry, which will preserve them from being injured by sharp winds; but you should be careful not to draw any of the earth over their seed leaves. After this, they will require no farther care but to keep them clear from weeds until they produce fruit, when they should be carefully gathered two or three times a week; for if they are permitted to remain upon the plants a little too long, the beans will be too large for eating, and the plants would be greatly weakened thereby.

The large sorts of Kidney-beans must be planted at a greater distance row from row; for as these grow very tall, so if the rows are not at a farther distance, the sun and air will be excluded from the middle rows, therefore these should not be less than four feet and a half distance row from row; and when the plants are about four inches high, the poles should be thrust into the ground by the side of the plants, to which they will fasten themselves, and climb to the height of eight or ten feet, and bear plenty of fruit from the ground upward. The *Dutch* and *French* preserve great quantities of the large *Dutch* Beans for winter use, which they stew and make good with gravy and other sauces.

There are some persons who raise these in hot-beds, in order to have them early. The only care to be taken in the management of these plants, when thus raised, is to allow them room, and give them as much air as can be conveniently, when the weather is mild, as also to let them have but a moderate heat; for if the bed be over hot, they will either burn, or be drawn up so weak as never to come to good.

The best way of saving the seeds of these plants, is to let a few rows of them remain ungathered in the height of the season; for if you gather from the plants for some time, and afterwards leave the remaining for seed, their pods will not be near so long and handsome, nor will the seed be so good. In autumn, when you find they are ripe, you should in a dry season pull up the plants, and spread them abroad to dry; after which you may thresh out the seed, and preserve it in a dry place for use.

PHILADELPHUS. *Lin. Gen. Plant.* 540. Pipe tree, or Mock Orange.

The Characters are,

It hath a permanent empalement, cut into five acute parts sitting upon the germen. It hath four or five roundish plain petals, and twenty awl-shaped stamina. The germen is situated under the flower, supporting a slender style divided in four parts, which afterward becomes an oval acute-pointed capsule, having four cells filled with small oblong seeds.

The Species are,

1. PHILADELPHUS *foliis ovato-lanceolatis acutè dentatis.* Philadelphus with oval spear-shaped leaves which are acutely indented; the white Syringa, or Mock Orange.

2. PHILADELPHUS *foliis ovatis subdentatis, flore solitario pleno.* Syringa or Mock Orange, with oval leaves which are somewhat indented, and double flowers standing singly on the sides of the branches.

3. PHILADELPHUS *foliis integerrimis*. *Lin. Sp. Plant.* 470. Philadelphus with entire leaves.

The first sort has been long cultivated in the *English* gardens as a flowering shrub, but the place where it naturally grows is uncertain. This sends up a great number of slender stalks from the root, which have a gray bark, branching out from their side, garnished with oval spear-shaped leaves; they have several acute indentures on their edges, their surface rough, and of a deep green on their upper side, but pale on their under, and have the taste of a fresh Cucumber. The flowers come out from the side and at the end of the branches, in loose bunches, each standing on a short distinct foot-stalk; they have four oval petals which spread open, with a great number of stamina within, surrounding the style. The flowers are white, and have a strong scent, which at some distance resembles that of Orange flowers, but when near is too powerful for most persons. This shrub rises seven or eight feet high.

There is a variety of this with variegated leaves, which some people preserve in their gardens; but as the stripes generally disappear when the plants are in health, so it makes little appearance.

The second sort is of humble growth, seldom rising above three feet high; the leaves are shorter than those of the former, and approach near to an oval form; they are but little indented on their edges. The flowers come out singly from the side of the branches, and have a double or treble row of petals, of the same size and form as the other, and the flowers have the same scent; but this sort flowers very rarely, so is not much esteemed.

Both these are extreme hardy, and will thrive in almost any soil or situation, but will grow taller in light good ground, than in that which is stiff. They are usually propagated by suckers, which are sent out from their roots in great plenty; they should be taken from the old plants in autumn, and planted in a nursery to grow one or two years till they have obtained strength, and then they should be transplanted to the place where they are designed to remain. They are commonly disposed in wilderness work, among other shrubs of the same growth, where they add to the variety.

The third sort grows naturally in *Carolina*, and is as yet very rare in *Europe*. This rises with a shrubby stalk about sixteen feet high, sending out slender branches from the sides opposite, which are garnished with smooth leaves shaped like those of the Pear tree, which are entire, standing opposite on pretty long foot-stalks. The flowers are produced at the end of the branches, they are large, each having four oval petals which spread open, and have large empalements, composed of four acute-pointed leaves. The petals are white, and within these stand a great number of short stamina, terminated by yellow summits.

This shrub is very rare in *England*, for it will not rise from seeds; I have sown the seeds which were sent me by the late Dr. Dale from *Carolina*, two or three times without any success, and others have done the same, which occasions its present scarcity in *England*; but when the plants are procured from abroad, they may be propagated by laying down their branches. I had one of the shrubs which was sent me by the gentleman before-mentioned, which had thriven in the *Chelsea* garden near two years; and some of the branches which were laid down had put out roots, but they were all destroyed by cold in the winter 1740.

PHILLYREA. *Tourn. Inst. R. II.* 496. *tab.* 367. Phillyrea, or Mock Privet.

The Characters are,

The flower has a small permanent empalement cut into five parts at the brim. It has one petal with a very short tube, cut into

five parts which turn backward, and two short stamina standing opposite, terminated by single erect summits. It has a roundish germen supporting a slender style, crowned by a thick stigma. The germen afterward turns to a globular berry with one cell, inclosing one roundish seed.

The Species are,

1. PHILLYREA *foliis ovato-lanceolatis integerrimis*. Phillyrea with oval, spear-shaped, entire leaves; commonly called the true Phillyrea.

2. PHILLYREA *foliis ovatis subintegerrimis*. Phillyrea with oval leaves which are almost entire; called broad-leaved Phillyrea.

3. PHILLYREA *foliis cordato-ovatis serratis*. *Hort. Cliff.* 4. Phillyrea with oval heart-shaped leaves which are sawed; or broad-leaved prickly Phillyrea.

4. PHILLYREA *foliis lanceolatis integerrimis*. *Hort. Cliff.* 4. Phillyrea with spear-shaped entire leaves; Privet-leaved Phillyrea.

5. PHILLYREA *foliis lanceolato-ovatis integerrimis, floribus confertis axillaribus*. Phillyrea with spear-shaped, oval, entire leaves, and flowers growing in clusters from the sides of the branches; Olive-leaved Phillyrea.

6. PHILLYREA *foliis lineari-lanceolatis integerrimis, floribus confertis axillaribus*. Phillyrea with narrow, spear-shaped, entire leaves, and flowers growing in clusters from the sides of the branches; narrow-leaved Phillyrea.

7. PHILLYREA *foliis linearibus*. Phillyrea with very narrow leaves; commonly called Rosemary-leaved Phillyrea.

The first sort here mentioned, is the most common in the *English* gardens, where it is known by the title of true Phillyrea; so called, to distinguish it from the *Alaternus*, which is called simply Phillyrea, by the gardeners. This rises with a strong upright stem, to the height of eighteen or twenty feet, dividing into several branches, covered with a smooth grayish bark, garnished with oval spear-shaped leaves placed opposite, which are entire, firm, and of a light green. The flowers come out from the wings of the stalk on each side, they are of an herbaceous white colour, and grow in small clusters. They are succeeded by globular berries with one cell, inclosing a single seed of the same form.

The second sort rises to an equal height with the first, but the branches are more diffused, and have a darker bark; the leaves are oval, and of a darker green, a little sawed on their edges. The flowers come out from the wings of the branches, growing in long bunches; they are of an herbaceous white colour as the former, and are succeeded by berries of the same form.

The third sort rises with an upright stem as high as the two former, sending out several strong branches which grow erect, covered with a gray bark, garnished with oval heart-shaped leaves, which are firm, of a lucid green, and sawed on their edges, each serrature ending in a spine. The flowers and seeds of this are like those of the two former sorts.

The fourth sort is of humbler growth than either of the former, seldom rising more than ten feet high; the branches are weaker, and spread wider than those, and are covered with a light brown bark; they are garnished with stiff spear-shaped leaves, of a light green, and sit close to the branches. The flowers are produced in small clusters at the wings of the branches on each side; they are small, and whiter than those of the former, and are succeeded by small berries which ripen in the autumn.

The fifth sort rises about the same height as the fourth, the branches are stronger and spread out wider; the bark is of a lighter colour; the leaves are stiff, smooth, and entire, standing on very short foot-stalks, of a lucid green, and terminate in a point. The flowers come out in clusters

upon

upon pretty long foot-stalks, at the wings of the young branches; they are small, white, and have round berries succeeding them, which ripen in autumn.

The sixth sort rises with a woody stalk ten or twelve feet high, sending out branches by pairs, which are covered with a brown bark spotted with white, and are garnished with smooth, stiff, narrow, spear-shaped leaves, which are entire, sitting close to the branches, of a light green, and point upward. The flowers come out in large clusters at each joint of the branches, to which they sit close like the whorled flowers, almost surrounding the stalk; they are small, white, and are succeeded by small berries which ripen in autumn.

The seventh sort is of humbler growth than either of the former, seldom rising more than five or six feet high, sending out slender branches opposite; the leaves are of a dark green, stiff, very narrow, and entire. The flowers are small, white, and grow in clusters from the side of the branches. The berries of this sort are very small, and rarely ripen in *England*.

These plants all grow naturally in the south of *France*, *Spain*, and *Italy*, but are hardy enough to thrive in the open air in *England*; and are never injured except the winters are very severe, which sometimes causes their leaves to fall, and kills a few of the weaker branches, but these are repaired by new shoots the following summer; so that there are but few of the ever-green trees which are hardier than these, or that deserve more to be cultivated for pleasure.

The three first sorts are very proper to intermix with other ever-green trees of the same growth to form clumps in parks, or to plant round the borders of woods, which are filled with deciduous trees, where in the summer time the dark shade of these ever-greens will make a fine contrast with the brighter green leaves of the deciduous trees, and in winter, when the latter are destitute of leaves, they will have a fine effect; and these will be a fine harbour for birds. They may be trained up to stems, so as to be out of the reach of cattle, therefore may be planted in open places, where, if they are fenced against cattle till they are grown up, they may be afterwards exposed.

The other sorts, which are of humbler growth, must be confined to gardens or other inclosures, where they may be secured from cattle, hares, rabbits, &c. otherwise they will soon be destroyed.

These plants are propagated either from seeds or layers, but the latter, being the most expeditious method in *England*, is chiefly preferred. The best time to lay them down is in autumn, when you should dig the ground round the stems of the plants intended to be layed, making it very loose; then making choice of a smooth part of the shoot, you should make a slit upward (in the manner as is practised in laying of Carnations), and then bend the branch gently down to the ground, making a hollow place with your hand to receive it; and having placed the part which was slit in the ground, so as that the slit may be open, you should fasten it down with a forked stick, that it may remain steady, covering that part of the branch with earth about three inches thick, observing to keep the upper part erect. You must keep them clear from weeds the spring and summer following, which, if suffered to grow up amongst them, will prevent their taking root.

The autumn following most of these plants will be rooted, at which time they may be taken off, and carefully planted in a nursery, where they may be trained up three or four years in the manner you intend them to grow, during which time you should dig the ground between the rows, and cut about the roots of the plants every year, which will cause them to strike out strong fibres, so as to support a good ball of earth when they are removed; you should

also support their stems with stakes, in order to make them straight, otherwise they are very apt to grow crooked and un-ightly.

When the plants have been thus managed three or four years, you may transplant them into the places where they are designed to remain. The best time for this work is the latter end of *September*, or the beginning of *October*; but in removing them, you should dig round their roots, and cut off all downright or strong roots, which have shot out to a great distance, that you may the better preserve a ball of earth to each plant, otherwise they are subject to miscarry; and when you have placed them in their new quarters, you should lay some mulch upon the surface of the ground to prevent its drying. You should also support the plants with stakes, until they have taken fast hold of the earth, to prevent their being turned out of the ground, or displaced by the winds. These trees delight in a middling soil, which is neither too wet and stiff; nor too dry, though the latter is to be preferred to the former, provided it be fresh.

Those sorts with small leaves are commonly two years before they take root, when laid; therefore they should not be disturbed, for the raising them out of the ground greatly retards their rooting.

PHILLYREA OF THE CAPE. See *Maurocena*.

PHLOMIS. *Tourn. Inst. R. H. 177. tab. 82.* The Sage tree, or *Jerusalem Sage*.

The Characters are,

The flower hath a permanent empalement with an oblong tube, having five angles. It is of the lip kind. The tube is oblong; the upper lip is oval, forked, and inflexed; the under is cut into three segments, the middle one being large and obtuse. It hath four stamina hid under the upper lip, two being longer than the other, and a germen divided into four parts, supporting a style the length of the stamina. The germen afterward becomes four oblong cornered seeds sitting in the empalement.

The Species are,

1. PHLOMIS foliis subrotundis tomentosis crenatis, caule fruticoso. Phlomis with roundish, woolly, crenated leaves, and a shrubby stalk.
2. PHLOMIS foliis lanceolatis tomentosis integerrimis, caule fruticoso. Phlomis with spear-shaped woolly leaves which are entire, and a shrubby stalk.
3. PHLOMIS foliis oblongo-ovatis petiolatis tomentosis, floribus capitatis, caule fruticoso. Phlomis with oblong, oval, woolly leaves having foot stalks, flowers growing in large heads, and a shrubby stalk.
4. PHLOMIS involucris setaceis hispida, foliis ovato-oblongis scabris, caule herbaceo. *Hort. Upsal. 171.* Phlomis with bristly prickly involucrum, oblong, oval, rough leaves, and an herbaceous stalk.
5. PHLOMIS involucris hispida subulatis, foliis cordatis scabris, caule herbaceo. *Hort. Upsal. 171.* Phlomis with awl-shaped prickly involucrum, rough heart-shaped leaves, and an herbaceous stalk.
6. PHLOMIS foliis lanceolatis tomentosis, foralibus ovatis, involucris setaceis lanatis. *Lin. Sp. Plant. 585.* Phlomis with spear-shaped woolly leaves, those under the flowers oval, and bristly woolly involucrum.
7. PHLOMIS foliis ovato-lanceolatis crenatis, subtus tomentosus, involucris setaceis. Phlomis with oval spear-shaped leaves which are woolly on their under side, and have a bristly involucrum.
8. PHLOMIS foliis cordatis acutis subtus tomentosus, involucris frillatis tripartitis. Phlomis with acute-pointed heart-shaped leaves, which are woolly on their under side, and the covers of the flowers divided into three parts.
9. PHLOMIS foliis cordatis rugosis subtus tomentosus, involucris lanatis, caule herbaceo. Phlomis with rough heart-shaped leaves, which are woolly on their under side, woolly

woolly covers to the flowers, and an herbaceous stalk.

10. *PHLOMIS foliis lanceolatis crenatis subtus tomentosis, involucri lanatis, caule fruticoso.* Phlomis with spear-shaped, crenated leaves which are woolly on their under side, woolly covers to the flowers, and a shrubby stalk.

11. *PHLOMIS foliis radicalibus cordatis utrinque tomentosis villosis.* *Lin. Sp. Plant.* 585. Phlomis whose lower leaves are heart-shaped, woolly, and hairy on every side.

12. *PHLOMIS involucri lanceolatis, foliis cordatis subtus tomentosis, caule suffruticoso.* Phlomis with spear-shaped involucriums, heart-shaped leaves which are woolly on their under side, and a shrubby stalk; whitest, shrubby, *Spanish Jerusalem Sage*, with an iron-coloured flower.

13. *PHLOMIS involucri subulatis, foliis cordato-ovatis subtus tomentosis, caule fruticoso.* Phlomis with awl-shaped involucriums, oval heart-shaped leaves which are woolly on their under side, and a shrubby stalk.

14. *PHLOMIS foliis alternatim pinnatis, foliolis laciniatis, calycibus lanatis.* *Lin. Sp. Plant.* 585. Phlomis with leaves alternately winged, whose lobes are cut, and woolly emplacements to the flowers.

The first fort grows naturally in *Spain* and *Sicily*; it hath a pretty thick shrubby stalk, covered with a loose bark, rising five or six feet high, dividing into many irregular, woolly, cornered branches. Their joints are pretty far asunder; at each of these are placed two roundish leaves opposite on short foot-stalks, woolly on their under side. The flowers are yellow, and come out in thick whorls round the stalks, having two lips; the upper lip is forked, bending over the under, which is divided into three parts; the middle is broad, and stretched out beyond the two small side segments.

The second fort hath a shrubby stalk like the first, but does not rise so high. The branches are weaker; the leaves are spear-shaped and oval, being longer and narrower than the former; the whorls of flowers are smaller, but the flowers are of the same shape and colour.

These two forts have been long propagated in the *English* gardens by the title of Sage tree, or *Jerusalem Sage*. The plants were formerly kept in pots, and housed in winter with other exotick plants, but of late years they have been planted in the open air, where they are seldom injured by cold, unless in very severe winters; so they are intermixed with other shrubs of the same growth in quarters of wilderness work, where they add to the variety.

These plants should have a dry soil and a warm sheltered situation, otherwise they will not live in the open air. They may be planted among Cistuses of all the different kinds, the shrubby Moon Trefoil, ever-green Cytisus, Wormwood tree, and some other exotick shrubs of the same countries, which require a warm situation and a dry soil, being too tender for open plantations which are exposed to strong cold winds; and as they are not of very long duration, they are better when separated from trees and shrubs, which continue many years; for these rarely live above twelve or fourteen years in dry ground, and not more than half so long in cold moist land, or where they are not well sheltered.

They are propagated by slips or cuttings, which if planted in a bed of light earth in *April*, just before the plants begin to shoot, and covered with mats to screen them from the sun every day, as also to observe when the ground is dry to give them water gently, they will get roots in about two months or ten weeks, when they may be carefully taken up, and transplanted into a nursery, where they may remain one year, and then be transplanted to the places where they are designed to stand, for these plants will not bear transplanting at a greater age.

The third fort hath a shrubby stalk like the former, but seldom rising more than four or five feet high, sending out branches on every side, garnished with broader hoary leaves than either of the former; they are of an oblong oval form, and have pretty long foot-stalks; they are whiter than those of the former. The flowers grow in large whorls or heads, which generally terminate the branches; they are larger than those of the other forts, and the upper lip is very hairy. The plants are equally hardy with the other, and may be propagated by slips or cuttings in the same way as is before directed for them.

The fourth fort grows naturally in the south of *France* and *Italy*; this hath a perennial root, and an annual stalk which rises about two feet high. When the roots are large, they send up a great number of square stalks, which are covered with a hairy down, garnished with oblong, oval, rough leaves sitting close to the stalks. The flowers grow in whorls round the stalks, having stinging bristly covers; they are of a bright purple colour, so make a pretty appearance.

This may be propagated by parting of the roots; the best time for doing of this is in the autumn, when the stalks begin to decay, that they may get root before the frost comes on, but they should not be parted oftener than every third year, if they are expected to have many flowers. This fort is hardy, so may be planted in exposed places, but not in moist ground.

The fifth fort grows naturally in *Tartary*; this hath a perennial root. The stalks are purple, have four corners, and rise five or six feet high, garnished with heart-shaped leaves placed opposite, deeply crenated on their edges. The flowers are purple, and grow in whorls round the stalks; their covers are awl-shaped, and set with stinging hairs. It is propagated by seeds, which should be sown upon an east border in the spring, and when the plants come up, they must be kept clean from weeds the following summer, and in the autumn they should be transplanted where they are to remain.

The sixth fort grows naturally in the south of *France*, in *Spain*, and *Italy*. The root is perennial, the stalk is annual. This sends out long, narrow, woolly leaves from the roots in tufts, which are enveloped at their base by a common covering; they are soft to the touch, and lie upon the ground. The stalks are slender, and near two feet long; their joints are far asunder; at each of these stand two oval leaves opposite, which embrace the stalk with their base. The whorls of flowers are also encompassed by these leaves, and within them is situated a radiated bristly involucrium, which cover the yellow flowers, shaped like those of the other forts. The stalks decay in the autumn, but the lower leaves continue all the year. It may be propagated by slips in the spring, and the plants require a dry soil and a warm situation.

The seventh fort grows naturally in *Portugal* and *Spain*. This hath a shrubby stalk which rises four or five feet high, sending out slender branches, which have four angles covered with a white bark, garnished with oval spear-shaped leaves crenated on their edges, woolly on their under side, standing on very short foot-stalks. The flowers come out in whorls at each joint; they have bristly involucriums, and are of a deep purple colour. It may be propagated by cuttings in the same way as the three first forts, and the plants require the same treatment.

The eighth fort grows naturally in the *Levant*; this hath a perennial root and an annual stalk. The leaves are heart-shaped, ending in acute points; they are downy on their under side, and have five strong veins. The stalks rise a foot and a half high, garnished at each joint with two leaves placed opposite, of the same form as the lower, but smaller.

The flowers grow in whorls round the stalks; they are of a worn out purple colour; their involucrum is cut into segments, and are closely shut.

The seeds of the ninth sort were sent from *Smyrna* by the late consul *Sherard*, to the *Chelsea* garden. This has a perennial root, and an annual stalk. The lower leaves are very woolly and heart-shaped, standing upon long woolly foot-stalks. The stalks, which are woolly, rise a foot high; the flowers are large, yellow, and grow in whorls round them; they have very long tubulous empalements, covered with down. This sort had survived many winters in the open air in the *Chelsea* garden, but in the year 1740 they were all destroyed.

The seeds of the tenth sort were also sent from *Smyrna* by the same gentleman, and several of the plants were raised in the *Chelsea* garden. This hath shrubby stalks, which rise about three feet high, covered with a yellowish down, sending out many slender irregular branches, garnished with narrow spear-shaped leaves, which are covered with a yellowish down on their under side. The flowers are produced in heads at the end of the branches; their involucrum is very downy; the flowers are smaller than those of either of the three first sorts, and are of a dirty yellow colour. This approaches near to the second sort, but the leaves are much smaller, the branches are slenderer, and are covered with a yellow down, especially toward the end of the branches. The whorls of flowers are not near so large, and are generally produced at the end of the branches.

This sort may be propagated by cuttings in the same way as the three first sorts, and the plants may be treated in the like manner, with this difference only, of planting them in a warmer situation, for it will not bear so much cold, though in a warm border the plants have lived several years abroad in the *Chelsea* garden.

The eleventh sort grows naturally in the *Archipelago*, and also in *Spain*, from both which countries I have received the seeds. It hath an annual stalk, but the root is perennial, as are also the lower leaves, which do not arise from the root immediately, but stand in clusters upon short trailing woolly branches; they have very long downy foot-stalks; they are heart shaped, and downy on both sides. The stalks are slender, and rise a foot high, garnished with oval spear-shaped leaves, which gradually decrease in size to the top. The stalks generally send out two side branches opposite, near the bottom, and from this division to the top are garnished with thin whorls of yellow flowers, which are not closely joined together, as in the other species, but each flower stands separate. Their empalements are oval, very downy, and closely shut up. This sort may be propagated by slips in the same manner as the sixth sort, and the plants should be treated in the like way.

The twelfth sort grows naturally in *Spain* and *Portugal*. This hath a shrubby stalk, which is a little ligneous, and rises about two feet and a half high; covered with a thick white down. There are many of the stalks which rise from the same root, garnished with heart-shaped leaves; from the lower part of the stalks, at each joint, there are two short shoots come out opposite, which have four or six small leaves of the same shape with the others. The flowers, which are of an iron colour, are produced in small whorls toward the upper part of the stalk, and have downy spear-shaped involucrum.

This sort multiplies by its spreading roots, so that they may be divided every other year; the best time for doing of this is about the middle of *September*, that the offsets may get root before the frost comes on, but there should be some mulch laid about their roots, to prevent the frost from penetrating the ground. It may also be propagated by cuttings in the same way as the three first sorts, during

the spring and summer months. The plants require the same treatment as the tenth sort, for they are not so hardy as the three first sorts; therefore if there is some tanners bark, or other mulch laid on the surface of the ground about their roots every winter, it will be a means of preserving the roots, so that if a severe winter should kill the stalks, the roots will put out new ones the spring following.

The thirteenth sort grows naturally in *Spain* and *Portugal*. This rises with several shrubby stalks from three to four feet high, which divide into several four-cornered branches, covered with a woolly down, garnished with leaves, which on the lower part of the stalks are heart-shaped, but upward they are of an oval spear-shape, woolly on their under side; they stand opposite upon short foot-stalks. The flowers come out in whorls round the stalks; they have awl-shaped involucrum, ending in acute points, and covered with down; they are of a bright purple colour, but are not succeeded by seeds in this country. This sort is propagated by slips or cuttings in the same way as the three first sorts, and the plants should be treated in the like manner as hath been before directed for the tenth sort.

The fourteenth sort grows naturally in the *Levant*. This hath a perennial root, and an annual stalk, but the lower leaves continue all the year; these are alternately winged, and the small lobes are cut on their edges. The stalks rise a foot and a half high, garnished with leaves of the same shape with the lower, but are smaller. The flowers come out in whorls round the stalks, like those of the other sorts, whose empalements are downy; they are of a worn-out purple colour, and appear in *June*, but the seeds do not ripen here.

It is propagated by offsets from the root in the same way as the eighth sort, but these are sent out sparingly also, and the plants require the same treatment. It is at present very rare in *England*, for the severe frost in the year 1740 destroyed all the plants here, which had survived all the winters for twenty years before in the open air.

All the species of this genus are ornamental plants, when properly disposed in gardens, so deserve a place, for there is generally a succession of flowers on them for two or three months, and their hoary down leaves, when intermixed with plants, whose leaves are green, make a pretty contrast.

PHLOX. *Lin. Gen. Plant.* 197. *Lychnidea*, or *Bastard Lychnis*.

The Characters are,

The flower has a cylindrical empalement, which is permanent, with five acute indentures at the top. It has one funnel-shaped petal, with a cylindrical tube, incurved at the base, plain at the top, where it is cut into five equal roundish segments, which spread open. It hath five short stamina, situated within the tube, two of which are longer than the tube. It hath a conical germen, supporting a slender style, crowned by an acute trifid stigma. The germen afterward turns to an oval capsule, with three cells sitting in the empalement, each cell containing a single seed.

The Species are,

1. PHLOX *foliis lineari-lanceolatis glabris acuminatis, caule erecto ramoso, corymbo terminali.* Phlox with smooth, narrow, spear-shaped leaves, ending in acute points, and upright branching stalks, terminated by flowers, which grow in a corymbus.

2. PHLOX *foliis lanceolatis sessilibus glabris crassis, caule erecto, floribus verticillatis terminalibus.* Phlox with smooth, thick, spear-shaped leaves, sitting close to the stalks, and upright stalks, terminated by flowers growing in whorls.

3. PHLOX *foliis cordato-lanceolatis levibus.* *Lin. Sp. Plant.* 152. Phlox with heart spear-shaped leaves, which are smooth.

4. PHLOX *foliis lato-lanceolatis, inferioribus alternis, caule ramoso.* *Lin. Sp. Plant.* 152. Phlox with broad spear-shaped leaves,

leaves, which are placed alternately at bottom, and a branching stalk.

5. *Phlox foliis lanceolatis margine scabris, corymbis compositis.* *Lin. Sp. Plant.* 151. Phlox with spear-shaped leaves, having rough borders, and flowers disposed in compound corymbuses.

6. *Phlox foliis lanceolatis villosis, caule erecto, corymbo terminali.* *Lin. Sp. Plant.* 152. Phlox with hairy spear-shaped leaves, and an upright stalk, terminated by a corymbus of flowers.

7. *Phlox foliis ovatis, floribus solitariis.* *Lin. Sp. Plant.* 152. Phlox with oval leaves and solitary flowers.

The first sort grows naturally in *Virginia*, and in some other parts of *North America*. This hath a perennial root, which sends up several stalks, in number proportionable to the size of the roots, near a foot and a half high, which divide into three or four small branches toward the top, terminated by a corymbus of flowers. The leaves on the lower part of the stalks are placed opposite; they are smooth, and set close to the stalks; the leaves on the upper part of the stalks are placed alternate. The flowers grow almost in form of an umbel, standing on short foot-stalks; their empalements are tubulous, have ten angles or furrows, and are cut at the top into five acute segments; the tube of the flower is twice the length of the empalement, and is divided at the top into five roundish segments, which spread open; these are of a light purple colour.

The second sort grows naturally in *Carolina*. This hath a perennial root, from which arise several smooth stalks near two feet high, garnished with stiff shining leaves placed opposite; they are spear-shaped, entire, and their edges are reflexed; the upper part of the stalk has generally two slender side branches, and is terminated by a head of flowers, which grow in whorls round the stalks, but the whorls are so nearly placed, as to appear one corymbus at some distance. The empalement of the flower is short, and deeply cut into five acute segments; the tube of the flower is long, and at the top is cut into five roundish segments, which spread open. These flowers are of a deeper purple colour than those of the former.

The third sort grows naturally in *Maryland*. This hath a perennial root, from which arise several upright stalks, of a purplish colour, closely covered with white spots; these grow about three feet high, garnished with heart, spear-shaped, smooth leaves. Toward the upper part of the stalks, are sent out small branches opposite, each being terminated by a small bunch of flowers; but the principal stalk is terminated by a long loose spike of flowers, composed of small bunches, arising from the wings of the stalk at each joint, each cluster having one common foot-stalk; the flowers are of a bright purple colour, but are rarely succeeded by seeds in *England*.

The fourth sort grows naturally in *North America*. This has a perennial root, from which arise several slender stalks, which are apt to incline to the ground, if they are not supported; these divide into several small branches, which spread from each other; the lower part of the stalks are garnished with broad spear-shaped leaves, placed alternate, sitting close to the stalks; but on the smaller branches they are narrower, and placed opposite. The flowers grow in loose bunches at the end of the branches; they have short empalements, which are cut into five narrow acute segments; the tube of the flower is long and slender, the segments at the top are broad and heart-shaped, inverted. They are of a light blue, but are rarely succeeded by seeds in *England*.

The fifth sort grows naturally in *North America*. This hath a perennial root and an annual stalk, which is smooth, of a light green, and rises about two feet high, sending out

a few side branches, garnished with spear-shaped leaves, placed opposite, sitting close to the stalks; they are of a dark green, and their edges are a little rough. The flowers are disposed in a corymbus at the top of the stalks; these are composed of many smaller bunches of flowers, which have each a distinct foot-stalk, and support a great number of flowers, which stand upon short slender foot-stalks; the empalement of the flower is short, cut almost to the bottom into five narrow acute segments; the tube of the flower is long, slender, and is cut at the top into five oval segments, which spread open. The flowers are of a pale purple colour, and are often succeeded by seeds, which ripen in the autumn.

The sixth sort grows naturally in *Virginia*. This hath a perennial root, from which arise a few single stalks about a foot high, garnished with narrow spear-shaped leaves, ending in acute points, which are a little hairy. The flowers are produced in a loose corymbus at the top of the stalk; their empalements are cut into acute segments almost to the bottom; the tube of the flower is slender, pretty long, and is cut at the top into five oval segments, which spread open. The flowers are of a light purple colour, but are seldom succeeded by seeds in *England*.

The seventh sort grows naturally in *Maryland*, and other parts of *North America*. This hath a perennial root, from which comes out two or three slender stalks about nine inches high, garnished with oval, rough, hairy leaves, placed opposite, upon very short foot-stalks. The flowers come singly at the top of the stalk; they have very slender tubes, but are cut into five roundish segments, which spread open. They are of a light purple colour, but are not succeeded by seeds in *England*.

These plants are hardy, so will thrive in the open air in *England*. They delight in a moist rich soil not too stiff, in which they will grow tall, and produce much larger bunches of flowers, than in dry ground; for when the soil is poor and dry, they frequently die in summer, unless they are duly watered.

They are generally propagated by parting their roots, because they do not often produce seeds in *England*. The best time for this is in autumn, when their stalks begin to decay. These roots should not be divided into small heads, if they are expected to flower well the following summer; nor should they be parted oftener than every other year, because when they are often removed and parted, it will greatly weaken the roots, so that they will send out but few stalks, and those will be so weak as not to rise their usual height; the bunches of flowers will also be much smaller.

The first, second, and fifth sorts, propagate pretty fast by their spreading roots, but the others increase but slowly this way, therefore the best method to propagate them is by cuttings; if the three first sorts are desired in plenty, they may be easily obtained by this method. The best time to plant the cuttings, is about the latter end of *April*, or the beginning of *May*, when the shoots from the roots are about four inches high; these should be cut off close to the ground, and their tops should be shortened; then they must be planted on a border of light loamy earth, and shaded from the sun until they have taken root; or if they are planted close together, and covered with bell or hand-glasses, shading them every day from the sun, they will put out roots in five or six weeks; but when they begin to shoot, the glasses should be gradually raised to admit the free air to them. As soon as they are well rooted, the glasses should be taken off, and the plants inured to the open air; then they should be soon after removed into a bed of good soil, planting them about six inches distance every way, observing to shade them from the sun, and water them duly till

till they have taken new root; after which, if they are kept clean from weeds, they will require no other care till autumn, when they should be transplanted into the borders of the flower garden, where they are designed to remain.

PHYLICA. *Lin. Gen. Plant.* 236. Bastard Alaternus.

The Characters are,

The flowers are collected in a disk, sitting in a common receptacle, each having a permanent empalement, composed of three narrow oblong leaves. They have one perforated petal, with an erect conical tube, cut into five parts at the brim, with an acute scale at each division, which join them together, and five small stamina inserted under the scale, terminated by single summits. The germen is situated at the bottom of the petal, supporting a single style, which afterward becomes a roundish capsule with three lobes, having three cells, each inclosing a single roundish seed, gibbous on one side, and angular on the other.

The Species are,

1. PHYLICA *foliis linearibus verticillatis. Lin. Sp. Plant.* 195. Phylica with linear leaves, growing in whorls.

2. PHYLICA *foliis lineari-subulatis, summis birsutis. Prod. Leyd.* 199. Phylica with narrow awl-shaped leaves, which are hairy at the top.

3. PHYLICA *foliis ovatis sparsis. Lin. Sp. Plant.* 195. Phylica with oval leaves growing scatteringly.

The first sort grows naturally at the *Cape of Good Hope*. It also grows wild about *Lisbon*, where there are large extents of ground covered with it like the heaths in *England*. This is a low bushy plant, seldom rising more than three feet high; the stalks are shrubby and irregular, dividing into many spreading branches. The young branches are closely garnished with short, narrow, acute-pointed leaves, placed in whorls round the stalks, to which they sit close; they are of a dark green, and continue all the year. At the end of every shoot the flowers are produced in small clusters, sitting close to the leaves; they are of a pure white, and begin to appear in the autumn, continuing in beauty all the winter, and decay in the spring, which renders the plant more valuable.

The second sort grows naturally at the *Cape of Good Hope*. This hath an erect shrubby stalk, which rises near three feet high, covered with a purplish bark; the leaves are narrow, short, and acute-pointed, sitting close to the branches in alternate order; they are thick, nervous, and of a dark green on their upper side, but hoary on their under. The flowers are collected in small heads at the end of the branches; they are white, woolly, and fringed on their borders, cut into six acute segments at the top. These appear the beginning of winter, and continue long in beauty.

The third sort is a native of the same country as the former. This rises with a shrubby erect stalk five or six feet high; the stalks, when old, are covered with a rough purplish bark, but the younger branches have a woolly down; these are garnished with thick oval leaves, about the size of those of the Box-tree; they are veined, smooth, and of a lucid green on their upper side, but are hoary on their under. The flowers are collected in small heads at the end of the branches; they are of an herbaceous colour, so make no great appearance. These appear at the same time with the former.

As these plants do not produce seeds in *England*, so they are propagated by cuttings, which, if properly managed, will take root freely. There are two seasons for planting these cuttings, the first is the latter end of *March* before the plants begin to shoot; if these are planted in pots, and plunged into a very moderate hot-bed, covering them close with bell or hand-glasses, observing to shade them from the sun in the middle of the day, and to refresh them gently with water, they will put out roots in two months; then they should be inured to the open air, and after they have

obtained strength, they should be taken out of these pots, and each planted in a separate small pot, filled with soft loamy earth, and placed in a shady situation until they have taken new root, when they may be removed to a sheltered situation, where they may remain till autumn.

The other season for planting of these cuttings, is about the beginning of *August*. At this time they may be planted in pots, which may be either plunged into an old hot bed, or the full ground, covering them close with bell or hand-glasses, as before, and treating them in the same way; these will put out roots in about two months, but it will then be too late in the season to transplant them, so they must remain in the same pots till spring.

These plants are too tender to thrive in the open air in *England*, so they must be kept in pots, and housed in winter; for although the first sort will live through the winter in a warm sheltered situation, when the seasons prove favourable, yet when severe frosts happen, they are always destroyed, but they require no artificial heat to preserve them, if they are sheltered under a hot-bed frame in winter, when they are young, and after they are grown large, kept in a green-house where they may enjoy the free air in mild weather, and treated in the same way as other hardy exotick plants from the same country; in the summer they must be placed abroad in a sheltered situation; with which management the plants will thrive and continue several years, and as they flower in the winter, they make a good appearance in the green-house during that season.

PHYLLANTHUS. *Lin. Gen. Plant.* 932. Sea-side Laurel.

The Characters are,

It hath male and female flowers in the same plant; the empalements of the flowers in both sexes are permanent, bell-shaped, and of one leaf, cut into six parts, which spread open. The flowers have no petals according to some, or no empalements according to others. The male flowers have three short stamina, which join at their base, but spread asunder at their top, and are terminated by twin summits. The female flowers have an angular nectarium surrounding the germen, which afterward becomes a roundish capsule with three furrows, having three cells, each containing a single roundish seed.

The Species are,

1. PHYLLANTHUS *foliis lanceolatis serratis, crenis floriferis. Hort. Cliff.* 439. Phyllanthus with spear-shaped sawed leaves, having flowers growing on their edges.

2. PHYLLANTHUS *foliis pinnatis floriferis, floribus pedunculatis, caule herbaceo erecto. Lin. Sp.* Phyllanthus with winged leaves, bearing flowers upon foot-stalks, and an upright herbaceous stalk.

3. PHYLLANTHUS *foliis pinnatis floriferis, floribus sessilibus, caule herbaceo procumbente. Lin. Sp.* Phyllanthus with winged leaves, bearing flowers sitting close, and a trailing herbaceous stalk.

4. PHYLLANTHUS *foliis pinnatis floriferis, caule arboreo, fructu baccato. Lin. Syst.* 1265. Phyllanthus with winged leaves, bearing flowers, a tree-like stalk, and the fruit a berry.

5. PHYLLANTHUS *caule arboreo, foliis ovatis obtusis integerrimis. Lin. Syst.* 1264. Tree Phyllanthus with oval, obtuse, entire leaves.

The first sort grows naturally upon the rocks near the sea, in all the islands of the *West-Indies*, where the inhabitants title it Sea-side Laurel. This is seldom found growing on the land, which occasions its scarcity in *Europe*; for the roots strike so deep into the crevices of the rocks, as to render it almost impracticable to transplant the plants, and it is very difficult to propagate by seeds; for unless they are sown soon after they are ripe, they will not grow, and the greatest part of the seed proves abortive, so that it is

very rare in *Europe*. There was formerly a plant of this sort in the gardens at *Hampton-Court*, but this, with many other fine plants, has been destroyed by the ignorance of the gardeners. I also saw a fine plant of this sort in the *Amsterdam* garden.

This grows with a woody stalk about fifteen or sixteen feet high; the leaves come out without any order; upon the edges of the leaves the flowers are produced, but especially toward the upper part, where they are placed very closely, so as almost to form a sort of border to the leaves; which, together with the shining green colour of the leaves, makes a very beautiful appearance; the leaves continue green all the year, which renders the plant more valuable.

It requires to be placed in a moderate stove in the winter, otherwise it will not live in *England*; but in summer it may be placed in the open air, in a warm sheltered situation. With this management the plant was in great vigour in the physick garden at *Amsterdam*.

The second sort is an annual plant, with an herbaceous stalk about a foot high, which branches out, and has winged leaves, composed of many oval lobes, under which the flowers are produced upon foot-stalks, ranged along the midrib; they are small, of an herbaceous colour, and as they are situated under the leaf, so make no great appearance; however, the plants are cultivated by those who delight in botany.

The third sort is also annual; the stalks trail on the ground, and are garnished with winged leaves, having oblong lobes; under which the flowers are ranged along the midrib, as in the other species, so make little appearance.

The fourth sort is the *Nilicamarum* of the *Hortus Malabaricus*, and the *Nux Emlieca* of the shops. This hath a woody tree-like stalk, spreading into many branches, garnished with narrow linear leaves, in shape like those of the deciduous Cypress; but as the plants have not produced flowers in *England*, so I can give no farther account of the tree.

The fifth sort grows naturally in the *West-Indies*, where it becomes a tree of middling stature: the leaves are almost oval, of a light green on their upper side, but grey on their under, being very entire. The flowers have not appeared in *England*, so nothing can be said of them; but the fruit which came over were the size of Walnuts, having three swelling cells, in each of which should be lodged a single seed, but two of them are generally barren; and those which seem to have fair seeds, upon examination, will be found hollow without any germ.

The second and third sorts grow naturally in both *Indies*: as they are annual, so their seeds may be sown upon a hot-bed in the spring; when the plants come up, and are fit to remove, they should be each put into a separate small pot, and plunged into a hot-bed of tanners bark, shading them from the sun till they have taken new root; after which their management should be the same as for other plants of the same countries: with this care they will perfect their seeds in autumn, which must be carefully watched, otherwise their husks will open, and scatter the seeds into such pots as are near them, where if the ground is not disturbed, the plants will come up the following spring.

The fourth sort grows naturally in the *East-Indies*, where it rises with a ligneous stalk to the height of twelve or fourteen feet; but the plants which have been raised in *England*, have not exceeded three or four, though there are some of ten years growth; for they frequently lose their leading shoot in winter, and put out lateral branches, which also are apt to lose their tops in winter; so the plants do not advance much, nor have any of them attempted to shew their flowers here, though the plants are in good health.

This and the fifth sort have been raised from seeds, which were sown upon a hot-bed, and the plants were put into pots, and plunged into a tan-bed in summer, and in winter removed into the bark-stove, where they have been constantly kept, for they were found to be too tender to live through the winter in a less degree of heat. Their cuttings, which have been planted, have failed, and their branches being too strong to make layers, they have not been propagated any other way than from the seeds.

PHYLLIS. *Lin. Gen. Plant.* 286. *Simpla Nobla*.

The Characters are,

The empalement of the flower is composed of two leaves sitting on the germen. The flower has five obtuse spear-shaped petals, which turn backward. It hath five short hair-like stamina, terminated by oblong summits. The germen, which is situated under the flower, has no style, but is crowned by two awl-shaped reflexed hairy stigmas, and afterward turns to an oblong angular fruit, containing two parallel seeds, convex on their outside, plain on the other, and broad at the top.

We have but one Species of this genus in the *English* gardens, viz.

PHYLLIS *stipulis dentatis*. *Prod. Leyd.* 92. *Phyllis* with indented stipulae; or *Simpla Nobla* of the *Canaries*.

This plant grows naturally in the *Canary Islands*. It rises with a soft shrubby stalk about two or three feet high, which is seldom thicker than a man's finger, of an herbaceous colour, and full of joints. These send out several small side branches toward the top, garnished with spear-shaped leaves, of a lucid green on their upper side, but pale on their under, having a strong whitish midrib, with several deep veins running from it to the sides. The flowers are produced at the end of the branches in loose panicles; they are small, and of an herbaceous colour at their first appearance, but before they fade, change to a brown or worn-out purple; they are cut into five parts to their base, where they are connected, and fall off without separating, so should be termed a flower of one petal. These segments are reflexed backward so as to cover the germen, which is situated under the flower, and afterward becomes a short turbinated, obtuse, angular fruit, which splits in two parts when ripe, each containing one seed, flat on the inside, convex on the outside, and angular.

It is propagated by seeds, which must be sown on a bed of fresh light earth the beginning of *April*; the plants will come up by the beginning of *May*; when they are fit to transplant, they should be put into separate pots, and placed in a shady situation until they have taken root; after which time they should be placed in a sheltered situation, where they may have the morning sun, and in summer will require to be frequently watered. In winter they must be sheltered from the frost, but require to have as much free air as possible in mild weather; the second year the plants will flower, so if in the spring some of the plants are shaken out of the pots, and put into the full ground, they will perfect their seeds much better than those which remain in the pots.

As these plants seldom continue in health above four or five years, it will be proper to raise a supply of young plants to succeed them.

PHYSALIS. *Lin. Gen. Plant.* 223. *Winter Cherry*.

The Characters are,

The flower hath a swelling permanent empalement, which is five cornered, and cut at the top into five acute points. The flower hath one wheel-shaped petal with a short tube, and a large brim, which is five cornered and plaited. It has five small awl-shaped stamina, which join together, and a roundish germen, supporting a slender style, crowned by an obtuse stigma. The germen afterward turns to an almost globular berry with two cells, inclosed

in the large inflated empalement, filled with compressed kidney-shaped seeds.

The Species are,

1. *PHYSALIS foliis geminis*. Lin. Sp. Plant. 183. Physalis with two leaves at a joint; the common Winter Cherry.

2. *PHYSALIS foliis cordatis integerrimis obtusis scabris, corollis glabris*. Lin. Sp. Plant. 183. Physalis with rough, obtuse, entire, heart-shaped leaves, and smooth petals.

3. *PHYSALIS radice perenni, caule procumbente, foliis ovatis acutè dentatis, petiolis longissimis*. Physalis with a perennial root, a trailing stalk, and oval leaves which are acutely indented, and have very long foot-stalks.

4. *PHYSALIS caule herbaceo, foliis ovato-lanceolatis acutè dentatis*. Tab. 206. fig. 1. Winter Cherry with an herbaceous stalk, and oval spear-shaped leaves which are acutely indented.

5. *PHYSALIS caule suffruticoso, foliis ovatis tomentosiss integerrimis*. Physalis with a shrubby stalk, and oval downy leaves which are entire.

6. *PHYSALIS caule fruticoso, foliis ovatis tomentosiss*. Lin. Vir. Cliff. 16. Physalis with a shrubby stalk, and oval woolly leaves.

7. *PHYSALIS caule fruticoso, ramis rectis, floribus confertis*. Lin. Sp. Plant. 180. Physalis with a shrubby stalk, erect branches, and flowers growing in clusters.

8. *PHYSALIS caule fruticoso, ramis flexuosis, floribus confertis*. Lin. Sp. Plant. 182. Physalis with a shrubby stalk, flexible branches, and flowers growing in clusters.

9. *PHYSALIS foliis ovato-lanceolatis integerrimis oppositis, caule fruticoso*. Tab. 206. fig. 2. Physalis with oval, spear-shaped, entire leaves which are placed opposite, and a shrubby stalk.

10. *PHYSALIS ramosissima, foliis villosis-viscosis pedunculis nutantibus*. Lin. Sp. Plant. 183. The most branching Physalis with hairy viscous leaves, and nodding foot-stalks.

11. *PHYSALIS ramosissima, ramis angulatis glabris*. Lin. Sp. Plant. 183. The most branching Physalis with angular smooth branches.

12. *PHYSALIS ramosissima, foliis ovatis acuminatis subdentatis petiolis longioribus*. Very branching Physalis with oval acute-pointed leaves, which are somewhat indented, and have longer foot-stalks.

13. *PHYSALIS ramosissima patula, ramis villosis, foliis ovatis acuminatis subdentatis*. The most branching spreading Physalis with woody branches, and oval acute-pointed leaves which are somewhat indented.

14. *PHYSALIS caule erecto ramoso, foliis ovatis serrato-dentatis, petiolis pedunculisque longissimis*. Physalis with an erect branching stalk, oval, indented, sawed leaves, and the foot-stalks of the leaves and flowers very long.

15. *PHYSALIS caule erecto ramoso, foliis ovato-lanceolatis viscosis, fructu maximo cordato*. Physalis with an erect branching stalk, oval, spear-shaped, viscous leaves, and a large heart-shaped fruit.

16. *PHYSALIS caule erecto ramoso, ramis angulatis, foliis sinuatis, calycibus acutangulis*. Physalis with an erect branching stalk, angular branches, sinuated leaves, and empalements having acute angles.

The first sort is the common winter Cherry, which is used in medicine; this grows naturally in Spain and Italy. The roots of this are perennial, and creep in the ground to a great distance, if they are not confined; these shoot up many stalks in the spring, which rise about a foot high or better, garnished with leaves of various shapes; some are angular and obtuse, others are oblong and acute-pointed; they have long foot-stalks. The flowers are produced from the wings of the stalks standing upon slender foot-stalks; they have one white petal which has a short tube, and is cut at the brim into five angles spreading open. In the

center of the tube is situated a roundish germen, supporting a slender style crowned by an obtuse stigma; this is accompanied by five stamina of the same length, terminated by oblong, erect, yellow summits which join together. The flowers are succeeded by round berries about the size of small Cherries, inclosed in an inflated bladder which turns red in the autumn, when the top opens and discloses the red berry, which is soft, pulpy, and filled with flat kidney-shaped seeds. Soon after the fruit is ripe, the stalks decay to the root.

This plant is easily propagated either by seeds or parting of the roots, the latter being the most expeditious method is generally practised. These roots may be transplanted and parted, any time after the stalks decay, till the roots begin to shoot in the spring; they love a shady situation, and should be confined, otherwise they will ramble to a great distance in one year, and when the stalks stand at a distance, they make no appearance. Their only beauty is in the autumn, when the fruit is ripe, at which time their red bladders, opening and disclosing the Cherry-shaped fruit, make a pretty appearance.

The second sort grows naturally at Buenos Ayres; this hath a creeping root, by which it multiplies very fast, sending up a great number of smooth stalks about two feet high, which divide toward their tops into small spreading branches, garnished with heart-shaped or oval leaves, standing upon pretty long foot-stalks. The flowers come out from the wings of the stalks toward the top, and have long slender foot-stalks; they are of a dirty yellow colour with purple bottoms, and are succeeded by viscous berries about the size of those of the common sort, of an herbaceous yellow colour, inclosed in a swelling bladder of a light green colour.

This plant is easily propagated by parting of the roots either in the spring or autumn, but is too tender to live abroad through the winter in England, so should be planted in pots and sheltered under a hot-bed frame in winter, where they may enjoy the free air at all times in mild weather.

The seeds of the third sort were sent me from Virginia, where the plant grows naturally; this hath a perennial root, but these roots do not creep in the ground like the two former. The stalks of this grow two feet long, and spread on the ground if they are not supported; these are garnished with oval leaves standing alternately upon very long foot-stalks; they are of a pale green having several acute indentures on their edges. The flowers come out from the wings of the larger stalk upon very short foot-stalks; they are larger than those of the common sort, and of a pale yellow colour. These are succeeded by very small yellowish berries which ripen in the autumn, when the season proves warm, but in cool moist summers they come to nothing.

This sort is propagated by seeds, which should be sown upon a warm border about the latter end of March, and when the plants come up, they should be thinned where they are too close, and kept clean from weeds till autumn, when the plants must be transplanted where they are to remain, which should be in a warm situation, where they will live through the winter in mild seasons, but are killed by severe frost if they are not screened.

The seeds of the fourth sort were sent me from Philadelphia by Dr. Bensil, who found the plants growing there naturally. This hath a perennial root composed of strong fibres, from which arise two or three hairy stalks about nine or ten inches high, dividing into several branches garnished with oval, spear-shaped, hairy leaves, of a pale green, having several acute indentures on their edges. The flowers come out from the side of the branches at the base of the foot-stalks of the leaves; these have long slender foot-stalks; they have very short tubes, but are larger than most of the species of this genus, of a sulphur colour with a dark

purple bottom. These are succeeded by oval yellowish berries, which ripen in the autumn. This sort may be propagated by seeds in the same way as the third, and the plants require the same treatment.

The fifth sort grows naturally at *Curassao* in the *West-Indies*. This hath a perennial creeping root, from which arise several slender stalks about a foot high, which become somewhat ligneous, but do not last above two years; the leaves are small, oval, and hairy: the flowers come out from the wings of the stalk toward the top, standing upon slender foot-stalks; these are of a sulphur colour, and have dark purple bottoms, but are seldom succeeded by berries in *England*.

This is easily propagated by parting of the roots in the spring, but the plants are too tender to live through the winter in *England* without artificial warmth, so the pots should be placed in a moderate warmth in winter, but during the months of *July*, *August*, and *September* they may be placed in the open air in a warm situation.

The sixth sort grows naturally at *Curassao*. This rises with a shrubby downy stalk about two feet high, dividing into several branches covered with a thick soft down, garnished with oval woolly leaves. The flowers come out at the end of the branches, at the base of the foot-stalks of the leaves; they are small, of a yellow colour, and sit close to the branches, but are not succeeded by berries in *England*.

This sort may be propagated by cuttings, which must be planted in small pots filled with light loamy earth, and plunged into a moderate hot-bed the beginning of *July*; when they are rooted, they may be removed into the open air, placing them in a sheltered situation. After they have obtained strength, they should be shaken out of the pots and separated, planting each in a distinct pot; then place them in the shade till they have taken new root, when they may be removed to their former situation, where they may remain till the end of *September*, and then be removed into the stove, where they should be placed in a moderate temperature of warmth during the winter season.

The seventh sort grows naturally in *Crete*, *Sicily*, and *Spain*. This rises with a shrubby stalk near three feet high, dividing into several branches which grow erect, and are garnished with oval spear-shaped downy leaves. The flowers come out in clusters on the side of the branches; they are small, of an herbaceous white colour sitting very close to the branches, and are succeeded by small berries, almost as large as those of the first sort, which when ripe are red.

This plant is propagated by seeds, which may be sown on a bed of light earth the beginning of *April*, and when the plants are two or three inches high, they should be taken up, and each planted in a separate small pot, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till the beginning of *October*; at which time they should be removed into the green-house, for the plants are too tender to live through the open air in winter, so they must be treated like other green-house plants, but should be sparingly watered in winter. These plants will continue several years if they are not too tenderly treated.

The eighth sort grows naturally at *Malabar*, and also at the *Cape of Good Hope*. This rises to the height of five or six feet, sending out long flexible branches, covered with a gray bark, garnished with oblong oval leaves which are often placed opposite. The flowers are produced in clusters at the base of the foot-stalks of the leaves; they are small, of an herbaceous yellow colour, and are succeeded by round purplish berries having ten cells, each including one seed.

This is propagated by seeds, which should be sown upon a moderate hot-bed, and the plants afterward treated in the same way as the last.

The ninth sort grows naturally at *Campeachy*. This hath a shrubby stalk, which rises ten or twelve feet high, covered with a gray hairy bark, garnished with oval spear-shaped leaves, placed alternately, of a pale green, and downy. The flowers come out from the wings of the stalks toward the end of the branches, sometimes one, and at others two are produced at the same joint opposite; they stand upon short nodding foot-stalks. The flowers are small, of a pale dirty yellow colour, having purple bottoms; these are succeeded by small, spherical, red berries, included in an oval dark purple bladder.

This may be propagated by seeds in the same way as the last mentioned, and the plants require the same treatment, but are not so hardy, therefore they must be kept in a moderate stove in winter, but in the middle of summer they should be placed in the open air, in a sheltered situation, for about three months. It may also be propagated by cuttings, which, if planted in pots during the summer months, and plunged into a gentle warmth, will take root freely, and may be treated in the same way as is before directed for the sixth sort.

The tenth sort is an annual plant, which grows naturally in *Virginia*. This branches out at bottom on every side; the branches frequently trail upon the ground; they are angular, and full of joints, garnished with hairy, viscous, heart-shaped leaves, standing upon pretty long foot-stalks, acutely indented on their edges. The flowers are produced on the side of the branches upon short, slender, nodding foot-stalks, of an herbaceous yellow colour with dark bottoms, which are succeeded by large swelling bladders, of a light green, inclosing berries as large as common Cherries, which are yellowish when ripe.

If the seeds of this sort are permitted to scatter, the plants will come up in the spring, and require no other care but to thin them, and keep them clean from weeds; or if the seeds are sown in the spring on a common border, the plants will rise very well, and need no other care.

The eleventh sort is also an annual plant, which grows naturally in the islands of the *West-Indies*. This rises with an upright branching stalk from two to three feet high. The branches are smooth, angular, and garnished with spear-shaped leaves, ending in acute points, sharply indented on their edges. The flowers come out toward the end of the branches upon short slender foot-stalks; they are very small, of a dirty white colour, and are succeeded by berries the size of common Cherries, covered with an angular bladder; they are of a yellowish colour when ripe.

This sort is propagated by seeds, which should be sown on a moderate hot bed; when the plants come up, and are a little advanced, they should be planted on a fresh hot-bed to bring them forward, and treated in the same way as the *Capicum*. When they are grown strong, and are hardened to bear the open air, they may be transplanted with balls of earth to their roots into a warm border, where their seeds will ripen.

The twelfth sort grows naturally in the *West-Indies*. This is an annual plant, with very branching stalks, which seldom rise above a foot high. The leaves are oval, of a deep green, and have long foot-stalks; the flowers are small, white, and stand upon short foot-stalks; the berries are small, and green when ripe.

The seeds of the thirteenth sort were sent me from *Barbadoes*. This is a low annual plant, seldom rising more than nine or ten inches high. The branches are hairy, and spread out almost horizontally; the leaves are oval, ending in acute points, and are a little indented; the flowers are small, white, and are succeeded by large fruit, inclosed in a long acute-pointed bladder,

The fourteenth sort was discovered at *La Vera Cruz*. This is an annual plant, with an upright branching stalk near two feet high, garnished with oval leaves, indented on their edges like a saw. They have long foot-stalks, and change to a purplish colour in the autumn. The flowers are small, white, standing upon very long foot-stalks, and are succeeded by large berries almost as large, and of the shape of Heart-cherries, of a yellowish green, with some purple stripes.

The fifteenth sort grows naturally in the same country. This is an annual plant, with a smooth, erect, branching stalk near three feet high, garnished with oval, spear-shaped, viscous leaves, standing on long foot-stalks. The flowers are small, of a pale yellow, and are succeeded by large heart-shaped fruit, of a pale yellow when ripe. The four last mentioned sorts are propagated by seeds in the same manner as the eleventh, and the plants require the same treatment.

The sixteenth sort grows naturally in *Peru*. This is an annual plant, rising with a strong, herbaceous, angular stalk four or five feet high, of a purplish colour, dividing into several angular branches, garnished with oblong leaves, which are deeply sinuated on their sides, of a deep green. The foot-stalks of the flowers are short; the empalement of the flower is large, bell-shaped, and deeply cut into five segments; the flower is large, of the open bell-shape, of a light blue colour, and is succeeded by berries about the size of common Cherries, inclosed in a large swelling bladder, having five sharp angles. If the seeds are permitted to scatter, the plants will come up the following spring, or if the seeds are sown on a bed of rich earth in the spring, the plants will rise easily, and may be afterward transplanted to the borders of the pleasure-garden, where they must be allowed room, for if the ground is good, the plants will grow very large.

Father *Feuillee*, who first discovered this plant in *Peru*, and has given a figure and description of it, recommends it greatly for its virtues, and says the *Indians* make great use of the berries to bring away gravel, and to relieve persons, who have a stoppage of urine, and gives the manner of using them, which is, to bruise four or five of the berries either in common water, or white wine, giving it the patient to drink, and the success is astonishing.

PHYTOLACCA. *Tourn. Inst. R. H.* 299. *tab.* 154. *American Night-shade.*

The Characters are,

The flower hath no petals; though the cover of the parts of generation being coloured, is by some termed petals; there are five of these which are concave, open, and permanent. It has for the most part ten stamina, which are the same length as the petals, terminated by roundish summits, and ten compressed orbicular germen, joined together on their inside, but are divided on their outside, upon which sit ten very short styles, which are reflexed. The germen afterward turns to an orbicular depressed berry, with ten longitudinal deep furrows, having ten cells, each containing a single smooth seed.

The Species are,

1. PHYTOLACCA *foliis integerrimis, radice perenni.* Phytolacca with entire leaves, and a perennial root; commonly called *Virginian Poke*, or *Porke Physick*.

2. PHYTOLACCA *foliis ovato-lanceolatis, floribus sessilibus.* Phytolacca with oval spear-shaped leaves, and flowers sitting close to the stalks.

3. PHYTOLACCA *spicis florum longissimis, radice annua.* *Tab.* 207. Phytolacca with the longest spikes of flowers, and an annual root.

The first sort grows naturally in *Virginia*, and also in *Spain* and *Portugal*. It hath a very thick fleshy root, as large as a man's leg, divided into several thick fleshy fibres.

When the roots are become large, they send out several stalks, which are herbaceous, as large as a good walking stick, of a purple colour, and rise to the height of six or seven feet, dividing into many branches at the top, garnished with large entire leaves, rounded at their base, but terminate in a point, and are placed without order, having short foot-stalks; in the autumn the leaves change to a purplish colour. From the joints of the branches, and at their divisions, come out the foot stalks of the flowers about five inches long; the lower part is naked, but the upper half sustains a number of flowers ranged on each side like common Currants. The flowers have five purplish petals, or covers, within which stand the ten stamina and styles. After the flowers are faded, the germen turns to a depressed berry with ten furrows, having ten cells, filled with smooth seeds.

It may be propagated by sowing the seeds in the spring upon a bed of light earth; and when the plants come up, they should be transplanted into the borders of large gardens, allowing them space to grow, for they must not be planted too near other plants, lest they overbear and destroy them, as they grow to be very large, especially if the soil be very good. When they have taken root, they will require no farther care, but only to clear them from weeds, and in the autumn they will produce their flowers and fruit; the stems of these plants constantly decay in the winter, but their roots will abide in the ground, and come up again the succeeding spring.

Parkinson says, that the inhabitants of *North America* make use of the juice of the root as a familiar purge; two spoonfuls of the juice will work strongly. Of late there have been some quacks, who pretend to cure cancers with this herb, but I have not met with one instance of its having been serviceable in that disorder. The inhabitants of *North America* boil the young shoots of this plant, and eat it like Spinach. The juice of the berries stain paper and linen of a beautiful purple colour, but it will not last long. If there could be a method of fixing the dye, it might be very useful.

The second sort grows naturally in the *Spanish West-Indies*, where the inhabitants constantly use it for their table. This plant is biennial, seldom continuing longer than two years, and when it flowers and produces plenty of seeds the first year, the plants frequently die before the following spring. This hath an herbaceous stalk about two feet high, dividing at the top into two or three short branches, garnished with oval spear-shaped leaves; they are of a deep green, and have foot-stalks an inch and a half long, placed without order. The foot-stalks of the flowers come out from the side of the branches opposite to the leaves; they are seven or eight inches long; the lower part about two inches in length is naked; the remaining part is garnished with white flowers, sitting close to the stalks; these are succeeded by flat berries, having many deep furrows divided into so many cells, each containing one smooth seed.

Dr. Linnaeus has supposed these two species were the same, but whoever sees the two plants growing, or attends to their descriptions, cannot doubt of their being different.

The third sort grows naturally in *Malabar*. This plant is annual, always perishing soon after it has perfected seeds, so that in this particular it differs greatly from the first: it rises with an herbaceous stalk from three to four feet high, which has several longitudinal furrows, and changes the latter part of summer to a purplish colour. It divides at the top into three or four branches, garnished with spear-shaped, dark, green leaves, standing upon short foot-stalks; sometimes alternately, at others they are placed opposite. The foot-stalks of the flowers come out from the side of the branches opposite to the leaves, the lower part being naked, as in the other sorts; the other part is garnished with larger flowers

flowers than those of the other sorts, white on their inside, of an herbaceous colour on their edges, and purplish on their outside, standing upon short foot-stalks; these have not always the same number of stamina, some of them have but eight, and others nine, which are terminated by roundish summits. The flowers are succeeded by orbicular, compressed soft berries, divided by deep furrows on their outside into ten cells, each containing one smooth shining black seed; the racemus of flowers is very narrow at the top, where it is commonly inclined.

These two sorts are not so hardy as the first, so their seeds should be sown upon a moderate hot-bed in the spring, and when the plants are fit to remove, they should be transplanted to another hot-bed to bring them forward; then they should be treated in the same way as other tender exotic plants; the beginning of July they may be transplanted out upon a warm border, or into pots: they will require to be watered duly in dry weather, and kept clean from weeds. As these plants perfect their seeds every autumn, they may be easily preserved.

PIERCEA. *Solanoides*. *Tournef. Art. Par.* 1706.

The Characters are,

The flower has no petals; the empalement which incloses the parts of generation is composed of four oblong, oval, coloured leaves. It hath four stamina, which stand erect and close together, terminated by small summits. In the center is situated a large roundish germen, supporting a short style, crowned by an obtuse stigma. The germen afterward turns to a roundish berry, sitting upon the reflexed empalement, having one cell, inclosing a rough seed of the same form.

I have taken the freedom of inscribing this genus of plants to the Right Hon. Hugh Piercy, Earl of Northumberland, who is not only a great encourager of botanical studies, but greatly skilled in the science himself.

The title of *Solanoides* was applied to this plant, in the Memoirs of the Academy of Sciences for the year 1706. Dr. Linnæus has supposed this to be the same with Plumier's *Rivinia*, so he has continued that title to this plant, and believed Plumier was mistaken, when he drew eight stamina to the flower, but Plumier's *Rivinia* is totally different from this plant, and the flowers of it have eight stamina, as he has represented it; so Linnæus is mistaken.

The Species are,

1. PIERCEA *foliis ovato-lanceolatis glabris*. Piercea with oval, spear-shaped, smooth leaves.
2. PIERCEA *foliis cordatis pubescentibus*. Piercea with heart-shaped downy leaves.

These plants grow naturally in most of the islands in the West-Indies, but the first is the most common there. It rises with a slender herbaceous stalk three or four feet high, which by age becomes a little ligneous at the bottom. It divides into many angular herbaceous branches, garnished with oval spear-shaped leaves, of a bright green, with slender foot stalks. The foot-stalks of the flowers come out from the side of the branches, at the base of the foot-stalks of the leaves, sustaining a great number of small white flowers, ranged along the upper part on both sides. These are succeeded by small red berries full of a red juice, inclosing one hard seed of the same form.

The second sort spreads more than the first; the leaves are smaller, heart-shaped, and covered with short hairy down; the spikes of flowers are not so long, and are not so closely placed together, and have longer foot-stalks.

These plants are propagated by seeds, which should be sown soon after they are ripe, for if they are kept long out of the ground, they seldom grow the same year. They should be sown in pots, filled with light earth, and plunged into a moderate hot-bed. When the plants come up two inches high, they should be each planted in a small half-

penny pot, and plunged into a moderate hot-bed; then they must be treated in the same way as other exotic plants. When the plants have obtained strength, they should be removed into the stove, and may be placed on shelves, and there they must constantly remain, for they are too tender to thrive in the open air in England in the warmest part of the year.

The juice of the berries of this plant will stain paper and linen of a bright red colour, and I have made many experiments with it to colour flowers, which have succeeded extremely well in the following manner. I pressed out the juice of the berries, and mixed it with common water, putting it into a phial, shaking it well together for some time, till the water was thoroughly tinged; then I cut off the flowers, which were white and just fully blown, and placed their stalks into the phial, and in one night the flowers have been finely variegated with red. The flowers, which I made the experiments on, were the Tuberose, and the double white Narcissus.

PILOSELLA. See Hieracium.

PIMPINELLA. *Lin. Gen. Plant.* 328. Burnet Saxifrage.

The Characters are,

It hath an umbellated flower; the principal umbel is composed of many rays or smaller umbels, neither of these have any involucrems; the greater umbel is uniform. The flowers have five heart-shaped inflexed petals, nearly equal, and five stamina longer than the petals, terminated by roundish summits. The germen is situated under the flower, supporting two short styles, crowned by obtuse stigmas. The germen afterward becomes an oblong oval fruit, divided in two parts, containing two oblong seeds, plain on the inside, convex on the other, and furrowed.

The Species are,

1. PIMPINELLA *foliis pinnatis, foliolis cordatis serratis, summis simplicibus trifidis*. Burnet Saxifrage, whose lower leaves are winged, and single three-pointed leaves at the top; greater Burnet Saxifrage.

2. PIMPINELLA *foliis pinnatis, foliolis radicalibus subrotundis, summis linearibus*. *Lin. Sp. Plant.* 263. Burnet Saxifrage with winged leaves, whose bottom lobes are roundish, but those at the top linear.

3. PIMPINELLA *foliis pinnatis, foliolis radicalibus pinnatifidis, summis linearibus trifidis*. Burnet Saxifrage with winged leaves, whose lobes of the bottom leaves are wing-pointed, and the upper ones linear and trifid; or lesser Burnet Saxifrage.

4. PIMPINELLA *foliis pinnatis hirsutis, foliolis radicalibus cordatis inæqualiter serratis, summis linearibus quinquesidis*. Burnet Saxifrage with hairy winged leaves, whose lobes of the bottom leaves are heart-shaped unequally sawed, and the upper ones linear and five-pointed; or German Burnet Saxifrage.

5. PIMPINELLA *foliis pinnatis lucidis, foliolis radicalibus lanceolatis, pinnato-serratis, summis linearibus pinnatifidis*. Burnet Saxifrage with shining winged leaves, the lobes of whose bottom leaves are spear-shaped and sawed, and the upper ones linear and wing-pointed; or largest Burnet Saxifrage of Austria.

6. PIMPINELLA *foliis radicalibus pinnatis crenatis, summi cuneiformibus incis. Lin. Sp. Plant.* 164. Burnet Saxifrage, whose lower leaves are winged, and indented on their edges, and the upper ones wedge-shaped and cut; or foreign Parsley with roundish leaves.

7. PIMPINELLA *foliis radicalibus trifidis incis. Lin. Sp. Plant.* 264. Pimpinell with trifid, cut, lower leaves; or common Anise.

The first sort grows naturally in chalky woods, and on the side of the banks near hedges, in several parts of England. The lower leaves of this sort are winged; the lobes are sharply sawed on their edges, and sit close to the midrib,

of a dark green. The stalks are more than a foot high, dividing into four or five branches; the lower part of the stalk is garnished with winged leaves, shaped like those at the bottom, but are smaller; those upon the branches are short and trifid; the branches are terminated by small umbels of white flowers, which are composed of smaller umbels or rays. The flowers have five heart-shaped petals, which turn inward, and are succeeded by two narrow, oblong, channelled seeds.

The second sort grows naturally in dry pastures in many parts of *England*. The lower leaves of this are composed of four pair of lobes, terminated by an odd one; they are indented on their edges; the stalks rise near a foot high, sending out three or four slender branches, garnished with very narrow leaves. The umbels of flowers are smaller than those of the first, as are also the flowers and seeds.

The third sort grows naturally in dry gravelly pastures in several parts of *England*. The lower leaves of this sort have five or six pair of lobes, terminated by an odd one. The stalks are slender, and rise about a foot high, sending out a few small branches, which have a narrow trifid leaf placed at each joint, and are terminated by small umbels of white flowers, composed of several rays, standing upon pretty long foot-stalks.

The seeds of the fourth sort were sent me from *Paris* by Dr. *Bernard de Jussieu*. The lower leaves of this sort are composed of six or seven pair of heart-shaped lobes, terminated by an odd one; they are hairy, and of a pale green. The stalk rises near two feet high, dividing into several branches, which have one narrow five-pointed leaf at each joint, and are terminated with umbels of white flowers, like those of the first sort.

The seeds of the fifth sort I gathered in Dr. *Boerhaave's* private garden near *Leyden*, who had received the seeds of it from *Austria*. The lower leaves have five pair of lobes, terminated by an odd one; they are deeply cut in regular jags opposite, in form of a winged leaf, of a lucid green, and have long foot-stalks. The stalks rise more than two feet high, dividing at the top into two or three slender branches, garnished at each joint with one wing-pointed narrow leaf. The umbels of flowers are very like the first.

All these sorts have perennial roots; they are propagated by seeds, which, if sown in the autumn, will more certainly succeed, than when they are sown in the spring. When the plants come up, they will require no other culture, but to thin them where they are too close, and keep them clean from weeds; the second year they will flower and produce ripe seeds, and the roots will abide some years.

The first sort is directed for medicinal use, but the herb-women either bring the third sort to market for it, or what is worst, substitute *Burnet* and *Meadow Saxifrage* in its stead. It enters the *pulvis ari compositis*, and is esteemed good for the gravel.

The last sort is the common Anise. This is an annual plant, which grows naturally in *Egypt*, but is cultivated in *Malta* and *Spain*, from which countries the seeds are annually brought to *England*. From these seeds there is a distilled water, and an oil drawn for medicinal use. The pastrycooks also make great use of these seeds in several of their compositions, to give them an aromack taste and smell. The lower leaves of this plant are divided into three lobes, which are deeply cut on their edges; the stalk rises a foot and a half high, dividing into several slender branches, garnished with narrow leaves, cut into three or four narrow segments, terminated by pretty large loose umbels, composed of many smaller umbels or rays, which stand on pretty long foot-stalks. The flowers are small, and of a yellowish white; the seeds are oblong and swelling.

The seeds of this should be sown the beginning of *April* upon a warm border, where the plants are to remain; when they come up, they should be thinned, and kept clean from weeds, which is all the culture this plant requires, but it is too tender to be cultivated in *England* for profit.

PINASTER. See Pinus.

PINGUICULA, Butterwort.

This plant is found growing upon bogs in many parts of *England*, but is never cultivated in gardens, so I shall pass it over with barely mentioning it.

PINUS. *Tourn. Inst. R. H.* 585. *tab.* 355. The Pine-tree.

The Characters are,

The male flowers are collected in a scaly conical bunch, having many stamina, which are connected at their base, terminated by erect summits, included in the scales, which supply the want of petals and empalement. The female flowers are collected in a common oval cone, and stand at a distance from the male on the same tree. Under each scale of the cone is produced two flowers, which have no petals, but a small germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes an oblong oval nut, crowned with a wing, included in the rigid scale of the cone.

The Species are,

1. PINUS foliis geminis crassiusculis glabris, conis pyramidalis acutis. Pine-tree with two thick smooth leaves in each sheath, and pyramidal acute cones; or Pineaster.

2. PINUS foliis geminis tenuioribus glaucis, conis subrotundis obtusis. Pine-tree with two narrower gray leaves coming out of each sheath, and roundish blunt cones; the cultivated Pine-tree, commonly called the Stone Pine.

3. PINUS foliis geminis brevioribus glaucis, conis parvis mucronatis. Pine-tree with two shorter gray leaves proceeding out of each sheath, and small acute-pointed cones; called Scotch Fir or Pine.

4. PINUS foliis geminis brevioribus latiusculis glaucis, conis minimis. Pine-tree with two shorter broad leaves in each sheath, which are gray, and the smallest cones; commonly called Tartarian Pine.

5. PINUS foliis sepius ternis tenuioribus viridibus, conis pyramidalis, squamis obtusis. Pine with three narrow green leaves often in each sheath, and pyramidal cones with blunt scales; called Mugho.

6. PINUS foliis quinis laevibus. *H. Scan.* 32. *Lin. Sp. Plant.* 1000. Pine-tree with five smooth leaves in each sheath; called Cembro.

7. PINUS foliis geminis longioribus glabris, conis longioribus tenuioribusque. Pine-tree with two longer smooth leaves in each sheath, and longer narrower cones; the maritime Pine.

8. PINUS foliis geminis tenuissimis, conis obtusis, ramis patulis. *Tab.* 208. Pine-tree with two narrow leaves in each sheath, obtuse cones, and spreading branches; *Aleppo* Pine.

9. PINUS foliis geminis brevioribus, conis parvis, squamis acutis. Pine-tree with two shorter leaves in each sheath, and small cones with acute scales; commonly called *Jersey* Pine.

10. PINUS foliis ternis, conis longioribus squamis rigidioribus. Pine-tree with three leaves, and longer cones, having rigid scales; commonly called three-leaved *Virginian* Pine.

11. PINUS foliis longioribus tenuioribus ternis, conis maximis laxis. Pine-tree with three longer narrower leaves, and the largest loose cones; called the *Frankincense*-tree.

12. PINUS *Virginiana* praelongis foliis tenuioribus, cono echinato glacili. *Pluk. Alm.* 297. *Virginian* Pine with longer and narrower leaves, and a slender prickly cone; called three-leaved *Bastard* Pine.

13. PINUS foliis quinis scabris. *Lin. Sp. Plant.* 1001. Pine-tree with five rough leaves in each sheath; commonly called *Lord Weymouth's* Pine.

14. *PINUS foliis ternis longissimis.* Pine-tree with the longest leaves, growing by threes out of each sheath; or three-leaved Marsh *American Pine*.

There are some other species of this genus in *America*, which have not been sufficiently examined to ascertain their differences; and it is probable some of the *European* kinds, which are now supposed to be only varieties of the sorts here enumerated, may be distinct species; but as I have had no opportunity of seeing their cones, so I have omitted them here.

The first sort here enumerated is the Pineaster, or wild Pine, which grows naturally on the mountains in *Italy* and the south of *France*, where there are forests of these trees, which, if suffered to stand, grow to a large size; but they are frequently cut for making of pitch; and in the south of *France*, the young trees are cut for stakes to support their vines. This grows to a large size; the branches extend to a considerable distance, and while the trees are young, they are fully garnished with leaves, especially where they are not so close as to exclude the air from those within; but as they advance in age, the branches appear naked, and all those which are situated below, become unsightly in a few years, for which reason they have not been much in esteem of late years; for as the wood of the *Scotch Fir* is much preferable to this, and the branches being generally better garnished with leaves, so the latter has been more generally propagated than the former. The leaves of this are of a dark green, and their points are obtuse. The cones are seven or eight inches long, pyramidal, and have pointed scales; the seeds are oblong, a little flattened on their sides, and have narrow wings on their tops.

The second sort, which is generally called the Stone Pine, is very common in *Italy*; but I much doubt of the country where it grows naturally, for so far as I have been able to learn, there are none of these trees growing in any part of *Italy*, but where they have been planted, or where the seeds have scattered from planted trees; and I have frequently received the seeds of a Pine from *China*, which were taken out of the cones so like those of this sort, as not to be distinguished from them; but these have never grown, either by their being too old, or from their having been taken out of the cones; for if the seeds of Pines are kept in the cones, they will grow at ten or twelve years old; but when they are out of their cones, they seldom grow well after two years, and some sorts do not grow after one. The leaves of this are not quite so long as those of the former sort, and are of a grayish or sea-green colour; the cones are not more than five inches long, but are very thick, roundish, and the scales end in an obtuse point; the seeds are more than twice the size of those of the former. The kernels of these are frequently served up in deserts to the table during the winter season in *Italy*, and formerly they were used in medicine here, but of late years the Pistachia Nuts have been generally substituted in lieu of them. The wood of this tree is white, not so full of resin as many of the other sorts, so is never cultivated for its timber, but chiefly for the beauty of its leaves and for the nuts, which are much esteemed in the south of *France*, and in *Italy*.

The third sort is generally known here by the title of *Scotch Pine*, from its growing naturally in the mountains of *Scotland*; but it is common in most parts of *Europe*. *Monf. du Hamel*, of the Royal Academy of Sciences at *Paris*, mentions his having received cones of this tree from *St. Domingo* in the *West-Indies*, so concludes that it grows indifferently in torrid, frozen, and temperate zones. It is by *John Bauhin* titled, *Pinus sylvestris, Genevensis vulgaris*; so that it grows commonly in the mountains near that city, and all through *Denmark, Norway, and Sweden*. The wood of this tree is the red or yellow deal, which is the most durable of

any of the kinds yet known. The leaves of this tree are much shorter and broader than those of the former sorts, of a grayish colour, growing two out of each sheath; the cones are small, pyramidal, and end in narrow points; they are of a light colour, and the seeds are small.

This sort grows well upon almost every soil; I have planted numbers of the trees upon Peat-bogs, where they have made great progress. I have also planted them in clay, where they have succeeded far beyond expectation; and upon sand, gravel, and chalk, they likewise thrive as well; but as they do not grow near so fast upon gravel and sand, as upon moist ground, so the wood is much preferable; for those trees which have been cut down upon moist soils, where they have made the greatest progress, when they have been sawn out into boards, have not been valuable, the wood has been white, and of a loose texture; whereas those which have grown upon dry gravelly ground, have proved nearly equal to the best foreign deals; and I doubt not but those plantations, which of late years have been made of these trees, will, in the next age, not only turn greatly to the advantage of their possessors, but also become a national benefit.

The fourth sort grows naturally in *Tartary*, from whence I received the seeds. This hath a great resemblance to the *Scotch Pine*, but the leaves are broader, shorter, and their points are more obtuse; they emit a strong balsamick odour when bruised; the cones of this are very small, as are also the seeds, some of which were black, and others white; but whether they are from different trees or the same, I could not learn, for the seeds were taken out of the cones, but in the parcel there was one entire cone.

The fifth sort grows naturally upon the mountains in *Switzerland*. This hath very narrow green leaves, which grow sometimes by pairs, and at others there are three coming out of each sheath; they generally stand erect; the cones are of a middle size, and pyramidal; the scales are flat, having each a small obtuse rising, but are very compact, till they are opened by the warmth of the sun. The seeds of this are much less than those of the Pineaster, but larger than those of the *Scotch Pine*.

The sixth sort grows naturally in *Switzerland*, and is by some persons supposed to be the same as the *Siberian*, but is different; for the cones of this are short and roundish, and the scales are close, whereas those of the *Siberian Pine* are long, the scales are loose; the leaves have a near resemblance to each other, but when compared, those of this tree are smooth, and the other are rough. The plants, which have been raised from the *Switzerland* seeds, have made much greater progress than those from the *Siberian* seeds; the latter are with difficulty kept alive in *England*. The leaves are long and narrow, smooth to the touch, of a light green, and five of them come out from the same sheath; the branches are closely garnished with them; the cones are about three inches long; the scales are pretty close; the seeds are pretty large, and their shells are easily broken.

The seventh sort grows in the maritime parts of *Italy*. This hath long smooth leaves, growing by pairs in each sheath; the cones are very long and slender; the seeds are about the size of those of the Pineaster.

The eighth sort grows naturally near *Aleppo*. This is a tree of middling growth in its native soil, and in *England* there are none of any large size; for most of the plants, which were growing here before the year 1740, were killed by the frost that severe winter. This tree branches out on every side near the root; the branches at first grow horizontally, but turn their ends upward; their bark is smooth, and of a dark gray colour. The leaves are long and very narrow, of a dark green, and grow by pairs in each sheath;

if they are bruised, they emit a strong resinous odour. The cones come out from the side of the branches; they are not much more than half the length of those of the Pineaster, but are full as large at their base; the scales are flatted, and the point of the cone obtuse. The seeds are much less than those of the Pineaster, but of the same shape.

The ninth sort grows naturally in *North America*. This never rises to any great height, and is the least esteemed in the country of all the sorts. While the plants are young, they make a pretty good appearance, but when they get to the height of seven or eight feet, they become ragged and unsightly, so are not worth cultivating.

The tenth sort grows naturally in *Virginia*, and other parts of *North America*, where it rises to a great height; and so far as we can judge by the growth of those trees which are now here, it seems likely to become a large tree in *England*. The leaves of this are long, three generally standing in each sheath; the cones of this sort come out in clusters round the branches; they are as long as the cones of the Pineaster, and have rigid scales; the seeds are winged, and nearly as large as those of the Pineaster.

The eleventh sort grows naturally in *North America*. This hath very long narrow leaves, growing by threes out of each sheath; the cones are as large as those of the Stone Pine, but the scales are looser, and the cones more pointed. The scales of this open horizontally, and discharge the seeds. This sort was sent over from *America* to Mr. Ball of *Exeter*, and also to Dr. Compton, Bishop of *London*, by the title of Frankincense Pine.

The twelfth sort grows naturally in *Virginia*. The cones of this have been brought to *England* of late years, by the title of Bastard three-leaved Pine. The leaves of this sort are long and narrow; sometimes there are three growing in each sheath, and at others but two; the cones are long, slender, and their scales terminate in sharp points; they are rather longer than those of the Pineaster, and not so thick.

The thirteenth sort grows naturally in *North America*, where it is called the white Pine. It is one of the tallest trees of all the species, often growing a hundred feet high in those countries, as I have been credibly informed; the bark of this tree is very smooth and delicate, especially when young; the leaves are long and slender, five growing out of each sheath; the branches are pretty closely garnished with them, so make a fine appearance; the cones are long, slender, and very loose, opening with the first warmth of the spring; so that if they are not gathered in winter, the scales open and let out the seeds. The wood of this sort is esteemed for making of masts for ships; it is in *England* titled Lord *Weymouth's*, or *New England Pine*. As the wood of this tree was generally thought of great service to the navy, there was a law made in the ninth year of *Queen Anne*, for the preservation of the trees, and to encourage their growth in *America*; and it is within forty years past these trees began to be propagated in *England* in any plenty, though there were some large trees of this sort growing in two or three places long before, particularly at Lord *Weymouth's* at *Longleet*, and Sir *Wyndham Knatchbull's* in *Kent*; and it has been chiefly from the seeds of the latter that the much greater number of these trees now in *England* have been raised; for although there has annually been some of the seeds brought from *America*, yet those have been few in comparison to the produce of the trees in *Kent*; many of the trees, which have been raised from the seeds of those trees, now produce plenty of good seeds, particularly those in the gardens of the late Duke of *Argyle* at *Whitton*, which annually produce large quantities of cones, which his grace when living most generously distributed to all the curious.

This sort and the *Scotch Pine* are the best worth culti-

vating of all the kinds for the sake of their wood; the others may be planted for variety in parks, &c. where they may make a good appearance in winter, when other trees are destitute of leaves.

All the sorts of Pines are propagated by seeds, which are produced in hard woody cones; the way to get the seeds out of those cones which are close, is to lay them before a gentle fire, which will cause the cells to open, and then the seeds may be easily taken out. If the cones are kept entire, the seeds will remain good some years, so that the surest way to preserve them, is to let them remain in the cones, until the time for sowing the seeds; if the cones are kept in a warm place in summer, they will open, and emit the seeds, but if they are not exposed to much heat, many of the sorts will remain entire some years, especially those which are close and compact; and the seeds, which have been taken out of cones of seven years old, have grown very well, so that these may be transported to any distance, provided the cones are well ripened, and properly put up.

The best time for sowing the seeds of Pines, is about the end of *March*; when the seeds are sown, the place should be covered with nets to keep off birds, otherwise, when the plants begin to appear with the husk of the seed on their tops, the birds will pick off the heads of the plants, and destroy them.

Where the quantity of seeds to be sown is not great, it will be a good way to sow them either in boxes or pots, filled with light loamy earth, which may be removed from one situation to another, according to the season of the year; but if there is a large quantity of the seeds, so as to require a good space to receive them, they should be sown on an east or north-east border, where they may be screened from the sun, whose heat is very injurious to these plants at their first appearance above ground. Those seeds, which are sown in pots or boxes, should also be placed in a shady situation, but not under trees; and if they are screened from the sun with mats at the time when the plants first come up, it will be a good method to preserve them.

Most of the sorts will come up in about six or seven weeks after they are sown, but the seeds of the Stone or cultivated Pine, and two or three of the others, whose shells are very hard, frequently lie in the ground a whole year; so that when the plants do not come up the first year, the ground should not be disturbed, but kept clean from weeds, and the following spring the plants will rise. This frequently happens in dry seasons, and when they are sown in places a little too much exposed to the sun.

When the plants appear, they must be constantly kept clean from weeds, and in very dry seasons, if they are now and then gently refreshed with water, it will forward their growth; but this must be done with great care and caution, for if they are hastily watered, it will wash the tender plants out of the ground, or lay them down flat, which often rots their shanks, and when this is too often repeated, it will have the same effect, so that unless it is judiciously performed, it will be the best way to give them none, but only screen them from the sun.

If the plants come up too close, it will be a good method to thin them gently about the beginning of *July*. The plants, which are drawn up, may then be planted on other beds, which should be prepared ready to receive them, for they should be immediately planted as they are drawn up, because their tender roots are soon dried and spoiled at this season of the year. This work should be done (if possible) in cloudy or rainy weather, and then the plants will draw out with better roots, and will soon put out new fibres again, but if the weather should prove clear and dry, the plants should be shaded every day from the sun with mats, and now and then gently refreshed with water. In drawing

up of the plants, there should be great care taken not to disturb the roots of the plants left remaining in the seed-beds, &c. so that if the ground be hard, the beds should be well watered some time before the plants are thinned, to soften and loosen the earth; and if, after the plants are drawn out, the beds are again gently watered to settle the earth to the roots of the remaining plants, it will be of great service to them, but it must be done with great care, so as not to wash out their roots, or lay down the plants. The distance, which should be allowed these plants, is four or five inches row from row, and three inches in the rows.

In these beds the plants may remain till the spring twelve months after, by which time they will be fit to transplant where they are to remain for good, for the younger plants are, when planted out, the better they will succeed; for although some sorts will bear transplanting at a much greater age, yet young plants planted at the same time will in a few years overtake the large ones, and soon outstrip them in their growth; and there is an advantage in planting young, by saving the expence of staking, and much watering, which large plants require. I have several times seen plantations of several sorts of Pines, which were made of plants six or seven feet high, and at the same time others of one foot high planted between them, which in ten years were better trees than the old ones, and much more vigorous in their growth; but if the ground, where they are designed to remain, cannot be prepared by the time before-mentioned, the plants should be planted out of the beds into a nursery, where they may remain two years, but not longer, for it will be very hazardous removing these trees at a greater age.

The best season to transplant all the sorts of Pines, is about the latter end of *March*, or the beginning of *April*, just before they begin to shoot; for although the *Scotch Pine*, and some of the most hardy sorts, may be transplanted in winter, especially when they are growing in strong land, where they may be taken up with balls of earth to their roots, yet this is what I would not advise for common practice, having frequently seen it attended with bad consequences, but those which are removed in the spring rarely fail.

Where these trees are planted in exposed situations, they should be put pretty close together, that they may shelter each other, and when they have grown a few years, part of the plants may be cut down to give room for the others to grow; but this must be gradually performed, lest by too much opening the plantation at once, the air should be let in among the remaining trees with too great violence, which will stop their growth.

Where-ever large plantations are designed to be made, the best method will be to raise the plants either upon a part of the same land, or as near to the place as possible, and also upon the same sort of soil; a small piece of ground will be sufficient to raise plants enough for many acres, but, as the plants require some care in their first raising, if the neighbouring cottagers, who have many of them small inclosures adjoining to their cottages; or where this is wanting, a small inclosure should be made them for the purpose of raising the plants, and they are furnished with the seeds and directions for sowing them, and managing the young plants, till they are fit for transplanting, the women and children may be usefully employed in this work, and the proprietors of land agreeing with them to take their plants, when raised, at a certain price, it would be a great benefit to the poor, and hereby they would be engaged to have a regard for the plantations when made, and prevent their being destroyed.

The *Scotch Pine*, as was before observed, being the hardiest of all the kinds, and the wood of it the most useful, is the sort which best deserves care. This will thrive upon the most barren lands, where scarce any thing else except heath

and furze will grow, so that there are many thousand acres of such land lying convenient for water carriage, which at present is of little benefit to any body, that might, by plantations of these trees, become good estates to their proprietors, and also a national benefit; and as the legislators have taken this into their consideration, and already passed some laws for the encouraging these plantations, as also for their preservation and security, so it may be hoped that this will be undertaken by the gentlemen who are possessed of such lands in all the different parts of the kingdom, with proper spirit; for although they may not expect to receive much profit from these plantations in their own time, yet their successors may with large interest, and the pleasure which these growing trees will afford them, by beautifying the present dreary parts of the country, will in some measure recompense them for their trouble and expence, and by creating employment for the poor, lessen those rates which are now so high in many parts of *England*, as scarce to be borne.

The expence of making these plantations is what most people are afraid of, so would not engage in it, but the greatest of the expence is that of fencing them from the cattle, &c. for the other is trifling, as there will be no necessity for preparing the ground to receive the plants, and the charge of planting an acre of land with these plants, will not be more than thirty shillings where labour is dear, exclusive of the plants, which may be valued at forty shillings more. I have planted many acres of land with these trees, which was covered with heath and furze, and have only dug holes between to put in the plants, and afterward laid the heath or furze, which was cut, upon the surface of the ground about their roots, to prevent the ground drying, and few of the plants have failed. These plants were most of them four years old from seed, nor was there any care taken to clean the ground afterward, but the whole left to shift, and in five or six years the Pines have grown so well, as to overpower the heath and furze, and destroy it.

The distance which I have generally planted these plants in all large open situations, was about four feet, but always irregular, avoiding planting in rows as much as possible, and in the planting, the great care is not to take up the plants faster than they can be planted, so that some men have been employed in digging up of the plants, while others were planting. Those who take up the plants, must be looked after to see they do not tear off their roots, or wound their bark; and as fast as they are taken up, their roots should be covered to prevent their drying, and put into their new quarters as soon as possible. In planting them, care should be had to make the holes large enough for their roots, as also to loosen and break the clods of earth, and put the finest immediately about their roots, then to settle the earth gently with the foot to the roots of the plant. If these things are duly observed, and a proper season chosen for performing it, there will be very little hazard of their succeeding, but I have seen some plantations made with plants, which were brought from a great distance, and had been so closely packed up, as to cause a heat, whereby most of the plants within had their leaves changed yellow, and few of them have grown, which has discouraged others from planting, not knowing the true cause of their failure.

After the plantations are made, the only care they require for five or six years, will be to secure the plants from cattle, hares, and rabbits, for if these are admitted to them, they will make great destruction in a short time, for if the branches are knawed by hares or rabbits, it will greatly retard the growth of the plants, if not destroy them.

In about five or six years after planting, the branches of the young trees will have met, and begin to interfere with each

each other, therefore they will require a little pruning, but this must be done with great caution. The lower tier of branches only should be cut off; this should be performed in *September*, at which time there will be no danger of the wounds bleeding too much, and the turpentine will harden over the wounds as the season grows cold, so will prevent the wet from penetrating of them. These branches should be cut off close to the stem of the plants, and care should be taken in the doing of this, not to break any of the remaining branches of the young trees. This work should be repeated every other year, at each time taking off only the lower tier of branches, for if the plants are much trimmed, it will greatly retard their growth, as it does in general that of all trees; but as these trees never put out any new shoots where they are pruned, so they suffer more from amputation than those which do.

In those parts of *France*, where they have forests of these trees, the proprietors always give the faggots to those who prune their young trees first, for their labour, so it costs them no money. At the second pruning, the proprietor has one-third of the faggots, and the dressers have the other two for their work, and afterward the faggots are equally divided between the workmen and proprietors, but there must be great care taken that they do not cut off more than should be.

In about twelve or fourteen years these will require no more pruning, for their upper branches will kill those below where they have not air; but soon after this, if the plants have made good progress, it may be necessary to thin them; but this should be gradually performed, beginning in the middle of the plantation first, leaving the outside close to screen those within from the cold, so by degrees coming to them at last, whereby those, which were first thinned, will have had time to get strength, so will not be in danger of suffering from the admission of cold air. When these plantations are thinned, the trees should not be dug up, but their stems cut off close to the ground, for their roots never shoot again, but decay in the earth, so there can no harm arise by leaving them, and hereby the roots of the remaining plants are not injured. The trees which are now cut, will be fit for many purposes; those which are strait, will make good putlocks for the bricklayers, and serve for scaffolding poles, so that there may be as much made by the sale of these, as will defray the whole expence of the planting, and probably interest for the money into the bargain.

As the upright growth of these trees renders their wood the more valuable, they should be left pretty close together, whereby they will draw each other up, and grow very tall. I have seen some of these trees growing, whose naked stems have been more than seventy feet high, and as strait as a walking cane, and from one of these trees there were as many boards sawed, as laid the floor of a room near twenty feet square. If these trees are left eight feet asunder each way, it will be sufficient room for their growth, therefore if at the first thinning a fourth part of the trees are taken away, the other may stand twelve or fourteen years longer, by which time they will be of a size for making ladders, and standards for scaffolding, and many other purposes, so that from this sale, as much may be made, as to not only pay the remaining part of the expence of planting, if any should be wanting in the first, but rent for the land with interest, and the standing trees for fortunes of younger children. This may be demonstrated by figures, and there has been several examples of late years, where the profits have greatly exceeded what is here mentioned.

The fifth sort is called in *Switzerland* Torch Pine; the peasants there make use of the wood of this tree instead of torches for burning. This tree grows to a great height in

its native soil, and is well furnished with branches. The wood is pretty full of resin, and when first cut is of a reddish colour. This is used by the inhabitants in their buildings.

The sixth sort of Pine makes but slow progress in *England*, so is not worth cultivating for profit, unless upon the summits of the northern mountains, where upon the peaty Moors, this, and the *Siberian Pine*, are likely to succeed much better than in any other part of *Britain*, for they naturally grow among snow.

The eighth sort is never a large tree in its native country, and in *England* it grows more like a shrub than a tree, and is often greatly injured by cold in winter, and by severe frosts sometimes killed; so that this is only kept for the sake of variety in the *English* gardens.

The ninth and tenth sorts are used indifferently by the inhabitants of *North America* for their buildings, and the same purposes as the other sorts of Pine.

There are some varieties of these in *America*, if they are not distinct species. Some of them ripen their cones the first year, but others are two years, and some three before they are ripe; but as these have not been well distinguished by those who reside in that country, and there are few of the sorts so large as to produce cones, so their differences cannot as yet be ascertained.

The eleventh and twelfth sorts I believe are indifferently called red Pine in *North America*, where their wood is greatly esteemed; the *French* at *Canada* have built a sixty gun ship entirely of this wood, called the *Saint Laurent*. I have had a little of this wood from *America*, which was very like that of the *Scotch Pine*, but had rather more resin. It may not be amiss to make trial of some of these sorts in plantations, to see which of them may deserve to be propagated; for in some places where they are growing, they thrive very well, but these will not succeed so well on dry land as moist.

The thirteenth sort is called the white Pine in most parts of *North America*; of this I believe there are two varieties, if not distinct species, but as they have not been well examined by persons of skill, we cannot take upon us to determine this, for *Monf. Gaultier's* description of one species is very different from that of the *Weymouth Pine*, and yet he has applied the title of white Pine to both.

This sort deserves to be propagated for its beauty, which is superior to all the sorts of Pines yet known in *England*. The bark of the young trees, and the branches are perfectly smooth; the branches are well garnished with leaves; these are long, and of an agreeable green, so that in summer they have a beauty, and in winter they make a better appearance than any of the sorts. The wood of this tree is very useful, especially for masts of ships, as the trees grow very tall and strait, and are pliable, so do not break with the wind, therefore the legislators thought proper to pass a law for the preservation and increase of these trees in *America*; but as these trees will thrive in *England*, they may be propagated in many places where the soil is proper for them. This sort grows best upon a moist light soil, but it should not be too wet; it will also thrive on a loamy soil, if it is not too much approaching to clay. The seeds of this sort should be sown with a little more care than those of the *Scotch Pine*, because their stems are not so strong, therefore are more apt to go off while young; so if these are sown in the full ground, the bed should be screened with mats from the sun every day, but exposed to the dews every night. When the plants come up, they should be treated in the same way, as is before directed for the *Scotch Pine*; and if all the plants of this kind are transplanted into beds in *July*, it will be a secure way to preserve them, but as these plants will grow larger than those of the *Scotch Pine*, they should be planted farther asunder; their rows should

be six inches distant, and in the rows they should be four inches apart. This will allow them room to grow till the spring twelve month following, when they may be either transplanted where they are to remain, or into a nursery where they may stand two years to get strength, but the sooner they are planted where they are to stand, the less danger there will be of their succeeding, and the larger they will grow; for although they will bear transplanting at a greater age, yet when they are planted young, they will make much greater progress, and grow to a greater size.

The soil in which this sort of tree thrives best is, a soft Hazel loam not too wet, in which I have frequently measured shoots of one year, which were two feet and a half long, and have for some years continued growing so much; they should have a sheltered situation, for I have observed where the trees have been much exposed to the south-west winds, they have not made near so great progress as those which grew in shelter; and where there have been plantations of these trees, those on the outside have not kept pace with the middle, nor have their leaves retained their verdure so well.

The fourteenth sort grows naturally on Swamps in many parts of *North America*, where I have been informed they grow to the height of twenty five or thirty feet. Their leaves are a foot or more in length, growing in tufts at the end of the branches, so have a singular appearance, but I have not heard the wood was of any use but for fuel, and there are few places here where these plants do well, for in very severe frosts their leading shoots are often killed, and in dry ground they will not thrive; so that unless the soil is adapted for them, it is to little purpose planting them.

From the wild Pine or Pineaster is procured the common turpentine, which is chiefly used by the farriers, and from it is distilled the oil of turpentine. The finer and more valuable part, which comes first, is called the spirit, what is left at the bottom of the still is the common resin.

The kernels of the nuts of the manured or stone Pine, are of a balsamick nourishing nature, good for consumptions, coughs, and hoarseness, restorative, and of service after long illnesses.

PIPER. *Lin. Gen. Plant.* 42. Pepper, or Lizard's-tail.

The Characters are,

The flowers are closely fastened to a single stalk, and have no complete sheath; these have no petals nor stamina, but have two summits opposite to the root of the germen, which are roundish; they have a large oval germen, but no style, crowned by a prickly triple stigma. The germen afterward becomes a roundish berry with one cell, containing one globular seed.

The Species are,

1. PIPER *foliis obversè ovatis enerviis. Lin. Sp. Plant.* 30. Pepper with obverse oval leaves, having no veins; or Low Lizard's-tail with a fleshy roundish leaf.

2. PIPER *foliis cordatis petiolatis, caule herbaceo. Lin. Sp. Plant.* 30. Pepper with heart-shaped leaves, having foot-stalks, and an herbaceous stalk.

3. PIPER *foliis lanceolatis-ovatis quinquenerviis rugosis. Lin. Sp. Plant.* 29. Pepper with rough, spear-shaped, oval leaves, having five veins.

4. PIPER *foliis lanceolatis nervosis rigidis sessilibus.* Pepper with stiff, spear-shaped, veined leaves sitting close to the branches.

5. PIPER *foliis peltatis orbiculato-cordatis obtusis repandis, spicis umbellatis. Lin. Sp. Plant.* 30. Pepper with target-formed leaves, which are orbicular, heart-shaped, obtuse, recurved, and have spikes growing in umbels.

6. PIPER *foliis lanceolato-ovatis nervosis, spicis brevibus.* Pepper with spear-shaped, oval, veined leaves, and short spikes.

7. PIPER *foliis ovato-lanceolatis tomentosis, caule arboref-*

cente. Pepper with oval, spear-shaped, woolly leaves, and a tree-like stalk.

8. PIPER *foliis ovato-lanceolatis, nervis alternis, spicis uncinatis. Lin. Sp. Plant.* 29. Pepper with oval spear-shaped leaves, having alternate veins, and crooked spikes.

9. PIPER *foliis ovato-lanceolatis, acuminatis nervis alternis, spicis gracilis uncinatis.* Pepper with oval, spear-shaped, acute-pointed leaves, having alternate veins, and slender crooked spikes.

10. PIPER *foliis cordato-ovatis nervosis acuminatis, spicis reflexis.* Pepper with oval, heart-shaped, nerved, acute-pointed leaves, and reflexed spikes.

11. PIPER *foliis cordatis subseptinerviis venosis. Flor. Zeyl.* 29. Pepper with heart-shaped leaves, which are veined, and have almost seven nerves.

12. PIPER *foliis cordatis quinquenerviis reticulatis. Lin. Sp. Plant.* 29. Pepper with heart-shaped netted leaves, having five veins.

13. PIPER *foliis ovato-lanceolatis acuminatis glabris trinerviis.* Pepper with oval, spear-shaped, acute-pointed, smooth leaves, having three veins.

14. PIPER *foliis lanceolato-ovatis rugosis, nervis alternis.* Pepper with spear-shaped, oval, rough leaves, having alternate veins.

The first sort grows naturally in many of the islands in the *West-Indies*. This sends out from the root many succulent herbaceous stalks almost as large as a man's little finger; they are jointed, and divide into many branches, never rising above a foot high, but generally spread near the ground, putting out roots at each joint, so propagate very fast, and soon cover a large space of ground. The leaves are very thick, succulent, broad, smooth, and entire. The foot-stalk, which sustains the spike or tail, comes out at the end of the branches; this is also very succulent, the whole length including the spike is about seven inches. The spike is strait, erect, about the size of a goose quill, and closely covered with small flowers, which require a glass to be distinguished, so have no beauty; but the whole spike much resembles the tail of a lizard, for which *Plumier* gave it that title.

These spikes appear great part of the year, but they rarely have any seeds in *England*; the plants increase very fast by their stalks, which put out roots. It requires a warm stove to preserve it in *England*, and should have but little wet, especially in winter. If the plants are plunged into the tan-bed in the stove, the stalks will put out roots into the tan, so may be cut off to make new plants.

The second sort grows naturally in the *West-Indies*; this is annual. The stalks are herbaceous and succulent; they rise about seven or eight inches high; the leaves are heart-shaped; the spikes of flowers, which are slender, come out at the end of the stalks; the flowers are very small, and sit close to the foot-stalk. These appear in *July*, and are succeeded by very small berries, each containing a small seed like dust. If these seeds are permitted to scatter on the pots near it, the plants will come up without trouble; or if the seeds are saved, and sown upon a hot-bed in the spring, the plants will rise easily. These should be transplanted into separate pots, and plunged into a hot-bed of tanners bark, treating them in the same way as other tender plants, but they should not have much wet.

The third sort grows naturally in *Jamaica* and *Barbadoes*. This hath several crooked stems, which rise to the height of twelve or fourteen feet, jointed, hollow, and pithy; these divide into many small branches, which are garnished with spear-shaped, oval, rough leaves, with five longitudinal veins. The spikes come out at the end of the branches, having many small flowers sitting close to the foot-stalk, which are succeeded by small berries.

The fourth sort grows naturally in *Jamaica*. The stalks of this are slender, and frequently trail upon the ground, putting roots out from their joints like the first; they are garnished with stiff spear-shaped leaves, with one strong midrib, and on the backside have several veins running from that to the sides. The spike of flowers is very slender, and shaped like those of the former sorts.

The fifth sort grows naturally in *Jamaica*. This hath a pretty thick spongy stalk, which rises fifteen feet high, dividing into several branches, which are jointed, and pithy. The leaves are almost round; the foot-stalk is fastened to the under side, so that the upper surface has a mark like a navel, where the stalk joins, and from that center run out the veins to the side. The leaves are shaped like a heart, but the other part is round; the stalk being fixed toward the middle, the leaves have the appearance of a target. The spikes are small, and grow in form of an umbel.

The sixth sort grows naturally at *La Vera Cruz* in *America*. This hath shrubby jointed stalks, which rise nine or ten feet high, dividing into several branches, which are garnished with spear-shaped oval leaves; they are veined and rough, of the same consistence with Laurel leaves. The spikes of flowers come out from the side of the branch at the joints, opposite to the leaves; they are not more than one inch and a half long, about the thickness of a small quill, and are closely set with flowers like the other sorts.

The seventh sort grows naturally at *La Vera Cruz*. This hath hollow pithy stalks, which rise twelve or fourteen feet high, dividing into many crooked branches, having swelling joints, garnished with oval spear-shaped leaves, having many veins, and are covered with a woolly down. The spikes of flowers come out from the side of the branches, opposite to the leaves; they are slender, and turn downward.

The eighth sort grows naturally in *Jamaica*. This hath many hollow stalks, which rise about five feet high; the joints are close and protuberant; they divide into smaller branches, which are garnished with oval, spear-shaped, rough, veined leaves. The spikes of flowers come out from the side of the branches, opposite to the leaves; they are slender, and are closely set with small flowers their whole length. This is called *Spanish Elder* in the *West-Indies*.

The ninth sort was sent me by Mr. *Robert Millar* from *Panama*, near which place he found it growing naturally. This hath several pithy stalks, which rise about five feet high, divided into many small branches, garnished with oval spear-shaped leaves, ending in acute points. The spikes of flowers are very slender, and incurved.

The tenth sort was sent me from *Carthagena*. This rises with several shrubby stalks fifteen feet high, dividing into many slender branches, with protuberant joints, garnished with heart-shaped, oval, smooth leaves, ending in acute points, of a dark green on their upper side, but pale on their under. The spikes of flowers come out from the side of the branches; they are extremely slender, and are reflexed at the end like a scorpion's tail.

The eleventh sort grows at *Panama*. This hath hollow shrubby stalks, which rise about four feet high, divided into many small branches, garnished with heart-shaped leaves, ending in long acute points. The spikes come out from the side of the branches; they are slender, bending in the middle like a bow, and are closely set with small herbaceous flowers, which are succeeded by small berries, inclosing a small single seed.

The twelfth sort grows naturally in *Jamaica*. This rises with a shrubby pithy stalk about five feet high, sending out several side branches, which have protuberant joints, garnished with heart-shaped leaves, full of small veins, which form a sort of net work. The spikes come out from the side of the branches, opposite to the leaves; they are slender,

a little bending in the middle, and are closely set with very small herbaceous flowers.

The thirteenth sort grows naturally at *Campeachy*. This hath many shrubby stalks, which rise about ten feet high, divided into several crooked branches toward the top, which have swelling joints, garnished with oval, spear-shaped, acute-pointed leaves, of a lucid green. The spikes come out from the side of the stalks, opposite to the leaves; they are pretty long, slender, and a little incurved. The flowers and seeds are like the other species.

The fourteenth sort grows naturally at *Campeachy*. This hath a shrubby stalk, which rises ten or twelve feet high, dividing toward the top into a great number of small hollow branches, garnished with spear-shaped, oval, rough leaves; some of them have long, and others very short foot-stalks; they are of a deep green on their upper side, but pale on their under, ending in acute points. The spikes come out from the side of the stalks, opposite to the leaves; they are long, slender, and are closely set with very small flowers like the other species.

The twelve last mentioned sorts are abiding plants, which require a warm stove to preserve them in *England*. They may be propagated by seeds, if they can be procured fresh from the countries where the plants grow naturally; these should be sown upon a good hot-bed in the spring, and when the plants come up, and are fit to transplant, they should be each put into a separate small pot, filled with light fresh earth, and plunged into a hot-bed of tanners bark, shading them every day from the sun, till they have taken fresh root; then they must be treated in the same way as other tender exotick plants, admitting fresh air to them daily, in proportion to the warmth of the season, to prevent their drawing up weak; and when the nights are cold, the glasses of the hot-bed should be covered with mats to keep them warm. As the stalks of most of these plants are tender when young, so they should not have much wet, which would rot them, and when water is given to them, it must be with caution; not to beat down the plants, for when that is done, they seldom rise again.

In autumn the plants must be plunged into the tan-bed of the bark-stove, and during the winter they must be sparingly watered; they require the same warmth as the Coffee-tree. In summer they require a large share of fresh air in hot weather, but they must be constantly kept in the stove, for they are too tender to bear the inclemency of our weather in summer.

PISONIA. *Plum. Nov. Gen. 7. tab. 11. Lin. Gen. Plant. 984.* Fingrigo, *vulgò.*

The Characters are,

The male flowers grow upon different plants from the fruit. The male flowers are funnel-shaped; the tube is short; the brim is expanded, and cut into five acute parts; they have five awl-shaped stamina, which are longer than the petal, terminated by obtuse summits. The female flowers are of the same form; they sit upon the germen, which is situated under the receptacle, supporting a cylindrical style longer than the petal, crowned by five oblong spreading stigmas. The germen afterwards turns to an oval capsule, having five angles and one cell, containing one smooth, oblong, oval seed.

We have but one Species at present in *England*, viz.

PISONIA *aculeata*. *Lin. Sp. Plant. 1026.* Prickly Pisonia, called Fingrigo in the *West-Indies*.

The male plants differ so much in appearance from the female, that those who have not seen them rise from the same seeds, would suppose they were different species, I shall therefore give short descriptions of each.

The male plants have stalks as thick as a man's arm, which rise ten or twelve feet high; the bark is of a dark brown colour, and smooth; these send out many branches opposite,

opposite, which are much stronger than those of the female. to do not hang about so loose. They are garnished with obverse, oval, stiff leaves, standing opposite on short foot-stalks. From the side of the branches come out short curls or spurs like those of the Pear-tree, having each two pair of small leaves at bottom, and from the top comes out the foot-stalk of the flowers, which is slender, dividing at the top into three; each of these sustain a small corymbus of herbaceous yellow flowers, having five stamina standing out beyond the petal, terminated by obtuse summits.

The stalks of the female plants are not so strong as those of the male, so require support. These rise eighteen or twenty feet high, sending out slender weak branches opposite, armed with short strong hooked spines, and garnished with small oval leaves, standing opposite on the larger branches, but on the smaller they are alternate, and have short foot-stalks. The flowers are produced in small bunches at the end of the branches, sitting upon the germen; they are shaped like those of the male, but have no stamina; in the center is situated a cylindrical style, crowned by five spreading stigmas. The germen afterward turns to a channelled, five-cornered, glutinous capsule, armed with small crooked spines, each containing one oblong, oval, smooth seed.

These plants are very common in the *Savannas*, and other low places in the island of *Jamaica*, as also in several other islands in the *West-Indies*; where it is very troublesome to whoever passes through the places of their growth, fastening themselves by their strong crooked thorns, to the clothes of persons; and their seeds being glutinous and burry, also fasten themselves to whatever touches them; so that the wings of the ground-doves and other birds, are often so loaded with the seeds, as to prevent their flying, by which means they become an easy prey.

In *Europe* this plant is preserved in the gardens of some curious persons for variety; it is propagated by seeds, which should be sown in pots filled with light rich earth, and plunged into a hot-bed of tanners bark; and when the plants come up, they should be transplanted into separate pots, and plunged into the hot-bed again, where they may remain till *Michaelmas*, when they should be removed into the stove, and plunged into the bark-bed, and treated in the same manner as hath been directed for several tender plants of the same country.

PISTACIA. *Lin. Gen. Plant.* 982. Turpentine-tree, Pistachia Nut, and Mastick-tree.

The Characters are,

The male and female flowers grow upon separate trees; the male flowers are disposed in loose sparsed katkins, having small five pointed empalements, but no petals; they have five small stamina, terminated by oval, four-cornered, erect summits. The female flowers have small trifid empalements, but no petals; they have each a large oval germen, supporting three reflexed styles, crowned by thick prickly stigmas. The germen afterward turns to a dry berry or nut, inclosing an oval smooth seed.

The Species are,

1. *PISTACIA foliis impari pinnatis, foliolis subovatis recurvis.* *Lin. Mat. Med.* 454. *Sp. Plant.* 1025. Pistachia with unequal winged leaves, whose lobes are somewhat oval and recurved; or the Pistachia-tree.

2. *PISTACIA foliis subternatis.* *Hort. Cliff.* 456. Pistachia with trifoliate leaves; or three-leaved Turpentine-tree.

3. *PISTACIA foliis pinnatis ternatisque, suborbiculatis.* *Lin. Sp. Plant.* 1025. Pistachia with winged and trifoliate leaves, which are almost round.

4. *PISTACIA foliis impari pinnatis, foliolis ovato-lanceolatis.* *Hort. Cliff.* 456. Pistachia with unequal winged leaves, whose lobes are oval and spear-shaped; or common Turpentine-tree.

5. *PISTACIA foliis abruptè pinnatis, foliolis lanceolatis.* *Hort. Cliff.* 456. Pistachia with abrupt winged leaves, and spear shaped lobes; or common Mastick-tree.

6. *PISTACIA foliis abruptè pinnatis, foliolis lineari lanceolatis.* Pistachia with abrupt winged leaves, and narrow spear-shaped lobes; or narrow-leaved Mastick-tree of *Marseilles*.

7. *PISTACIA foliis impari pinnatis, foliolis lanceolato-ovatis acuminatis.* Pistachia with unequal winged leaves, whose lobes are spear shaped, oval, and acute-pointed.

8. *PISTACIA foliis pinnatis deciduis, foliolis oblongo ovatis.* Pistachia with winged deciduous leaves, having oblong oval lobes; commonly called Birch-tree in *Jamaica*.

9. *PISTACIA foliis impari pinnatis, foliolis lanceolatis, exterioribus majoribus.* Pistachia with unequal winged leaves, whose lobes are spear-shaped, and the outer ones the largest.

The first sort is the Pistachia Nut-tree, whose fruit is much better known in *England* than the tree. This grows naturally in *Arabia*, *Persia*, and *Syria*, from whence the nuts are annually brought to *Europe*. In those countries it grows to the height of twenty-five or thirty feet; the bark of the stem and old branches is of a dark russet colour, but that of the young branches is of a light brown; these are garnished with winged leaves, composed sometimes of two, and at others of three pair of lobes, terminated by an odd one; these lobes approach toward an oval shape, and their edges turn backward; if these are bruised, they emit an odour like the shell of the nut. Some of these trees produce male flowers, others have female, and some, when old, have both on the same tree. The male flowers come out from the side of the branches, in loose bunches or katkins; they are of an herbaceous colour, having no petals, but have each five small stamina, crowned by large four-cornered summits, filled with farina; when that is discharged, the flowers fall off. The female flowers come out in clusters from the side of the branches; these have no petals, but have each a large oval germen, supporting three reflexed styles, and are succeeded by oval nuts. This tree flowers in *April*, but the fruit seldom ripens in *England*. It is propagated by the nuts, which should be planted in pots filled with light kitchen-garden earth, and plunged into a moderate hot-bed to bring up the plants; when these appear, they should have a large share of air admitted to them, to prevent their drawing up weak; and by degrees they must be hardened to bear the open air, to which they should be exposed the beginning of *June*, and may remain abroad till autumn, when they should be placed under a hot-bed frame to screen them from the frost in winter, for while they are young, they are too tender to live through the winter in *England* without protection, but they should always be exposed to the air in mild weather; the plants shed their leaves in autumn, so should not have much wet in winter; and in the spring, before they begin to shoot, they must be transplanted each into a separate small pot; and if they are plunged into a very moderate hot-bed, it will forward their putting out new roots; but as soon as they begin to shoot, they must be gradually hardened, and placed abroad again: the plants may be kept in pots three or four years, till they have got strength, during which time they should be sheltered in winter; afterward they may be turned out of the pots, and planted in the full ground, some against high walls to a warm aspect, and others in a sheltered situation, where they will bear the cold of our ordinary winters very well, but in severe frosts they are often destroyed. The trees flower and produce fruit in *England*, but the summers are rarely warm enough to ripen the nuts.

The second sort grows naturally in *Sicily* and the *Levant*, where it is a tree of middling size, covered with a rough brown bark, dividing into many branches, garnished with leaves, which for the most part have three, but some have four

four oval lobes; they stand upon long foot-stalks, and are of a dark green colour. The male flowers grow upon different trees from the female, and are like those of the former sort, but of a yellowish green colour. The female flowers of this sort I have not seen, so can give no account of them; these are succeeded by fruit like that of the former, but much smaller. This is propagated by seeds in the same manner as the former, and the plants should be treated in the same way, but require more protection in winter. There were several plants of this kind in the *English* gardens before the year 1740, which had lived abroad some years against walls, but that severe winter killed most of them.

The third sort grows in *Italy* and the south of *France*, but is supposed to have been transplanted there from some other country. This is a tree of a middling size, covered with a light gray bark, sending out many side branches, garnished with leaves, which have sometimes five, and at others but three roundish lobes, standing upon pretty long foot-stalks, of a light green colour. The male flowers grow upon separate trees from the fruit, as in the other sorts; the fruit of this is small, but eatable. This is propagated by the nuts in the same way as the first, and the plants are equally hardy.

The fourth sort grows naturally in *Barbary*, and also in *Spain* and *Italy*. This is a tree of middling size, covered with a brown bark, dividing into many branches, whose bark is very smooth while young; they are garnished with winged leaves, composed of three or four pair of oval spear-shaped lobes, terminated by an odd one. The flowers are male and female on different trees, as the former: the male flowers of this have purplish stamina; they appear in *April*, but I have not seen any of the female trees in flower. This is propagated by seeds, but unless they are sown in autumn soon after they are ripe, they seldom grow the first year, but remain in the ground a whole year; and unless the seeds are taken from such trees as grow near a male, the seeds will not grow, as I have several times experienced.

The plants of this sort may be treated in the same manner as the first, and are as hardy. There is a tree of this sort now growing in the gardens of the bishop of *London* at *Fulham*, against a wall, which was planted there above fifty years ago, which has endured the winters without cover; and some trees of this kind, which were planted in the open air, in the garden of his grace the Duke of *Richmond*, at *Goodwood* in *Suffex*, had survived several winters without any protection. From these trees the common turpentine of the shops was formerly taken, but there is little of that now imported, but that from some of the Cone-bearing trees is generally substituted for it.

The fifth sort is the common Maltick-tree, which is better known in the gardens by its *Latin* title of *Lentiscus*. This grows naturally in *Spain*, *Portugal*, and *Italy*, and being ever-green, the plants have been preserved in the *English* gardens, to adorn the green-house in winter. This in its native countries rises to the height of eighteen or twenty feet, covered with a gray bark, sending out many branches, which have a reddish brown bark, garnished with winged leaves, composed of three or four pair of small spear shaped lobes, without an odd one at the end. The midrib which sustains the lobes, has two narrow borders or wings, running from lobe to lobe; these lobes are of a lucid green on their upper side, but pale on their under. The male flowers come out in loose clusters from the side of the branches; they are of an herbaceous colour, appearing in *May*, and soon fall off. These are generally upon different plants from the fruit, which also grows in clusters, and are small berries of a black colour when ripe.

The plants of this sort are generally propagated by laying down of their young branches, which, if properly managed,

will put out roots in one year, and may then be cut off from the old plants, and each transplanted into separate small pots. These must be protected in winter, and in summer placed abroad in a sheltered situation, and treated in the same way as other hardy kinds of green-house plants. It may also be propagated by seeds in the same way as the Turpentine-tree, but if the seeds are not taken from trees growing in the neighbourhood of the male, they will not grow; and if they are kept out of the ground till spring, the plants rarely appear till the spring following. When these plants have obtained strength, some of them may be turned out of the pots, and planted against warm walls, where, if their branches are trained against the walls, they will endure the cold of our ordinary winters very well, and with a little shelter in severe winters they may be preserved.

The sixth sort grows naturally about *Marseilles*, and in some other places in the south of *France*, where it rises to the same height as the former, from which it differs in having one or two pair of lobes more on each leaf; the lobes are much narrower, and of a paler colour. This difference holds in the plants which are propagated by seeds, so may be pronounced a distinct species. It is propagated in the same way as the former sort, and is equally hardy.

The seventh sort grows naturally in many of the islands in the *West-Indies*, where it rises to a middling stature, dividing into many branches, covered with a purplish bark, and garnished with winged leaves, composed of two or three pair of spear-shaped, oval, acute-pointed lobes, terminated by an odd one; they are very thin and tender, and have long foot-stalks. The male flowers come out at the end of the branches; they are disposed in a single racemus (or long bunch); they are of a purplish colour, and have yellow summits. The fruit grows upon separate trees from the male flowers; they are shaped like the nuts of *Pistachia*, but are smaller, and not eatable.

The eighth sort grows naturally in *Jamaica*, and also in most of the other islands in the *West-Indies*, where it rises to the height of thirty or forty feet, covered with a loose brown bark, which falls off in large pieces; the stems are large; and divide into many branches toward the top, which are crooked and unsightly; these are garnished with winged leaves, composed of five or six pair of oblong, oval, smooth lobes, terminated by an odd one. The flowers come out at the end of the branches, in long loose bunches of a yellowish colour; these grow on different trees, or on different parts of the same tree from the fruit, which also hangs in long bunches, and is about the size of a middling Pea, having a dark skin, covering a nut about the size of a common Cherry-stone, and of the same colour.

These two trees are tender, so will not thrive in this country, unless they are kept in a warm stove. They are propagated by seeds, which must be taken from such trees as grow in the neighbourhood of the males, otherwise they will not grow, as I have too often found true. These should be sown in pots filled with light earth, and plunged into a good hot-bed of tanners bark; and when the plants are come up fit to remove, they should be each planted in a separate small pot, and plunged into a fresh hot-bed, treating them in the same way as other tender plants from the same countries, and in autumn they should be removed into the stove, plunging the pots into the tan-bed; during the winter they must have but little water, especially if they cast their leaves, which is generally the case after the first winter; for the young plants frequently retain their leaves the whole year, but afterward they are destitute of leaves for two months, in the latter part of winter. The plants should constantly remain in the stove, but in warm weather they must have a large share of air admitted to them.

The ninth sort is the true Mastick-tree of the *Lewant*, from which the Mastick is gathered. This has been confounded with the common *Lentiscus*, by most botannick writers; and *Townesfort*, who was on the spot where the Mastick is collected, has not distinguished the species; though he says, the leaves of the trees in the *Lewant*, are larger than those of the common sort, but takes no notice of their being unequally winged. The seeds of this tree were sent me by *Monf. Richard*, gardener to the king of *France* at *Versailles*, who received them from the island of *Cbio* in the *Lewant*; the bark of the tree is brown; the leaves are composed of two or three pair of spear-shaped lobes, terminated by an odd one; the outer lobes are the largest, the others gradually diminish, the innermost being the least; these turn of a brownish colour toward autumn, when the plants are exposed to the open air; but if they are under glasses, they keep green. The leaves continue all the year, but are not so thick as those of the common sort, nor are the plants so hardy. It is propagated by seeds in the same way as the common *Lentiscus*, but the plants while young should be kept in a gentle temperature of warmth in winter, and require a warm sheltered situation in summer. When they have obtained strength, they may be kept in a warm green-house in winter, but should have little water during that season.

PISUM. *Tourn. Inst. R. H.* 394. tab. 215. Pea.

The Characters are,

The flower hath an empalement cut into five points, the two upper being broadest; it hath four petals, and is of the butterfly kind. The standard is broad, heart-shaped, reflexed, and indented, ending in a point. The two wings are shorter, roundish, and close together; the keel is compressed, half-moon-shaped, and shorter than the wings. It hath ten stamina in two bodies, the upper single one is plain and awl-shaped, the other nine are cylindrical below the middle, awl shaped above and cut; these are joined together. It has an oblong compressed germen, with a triangular rising style. The germen afterward becomes a large long taper pod, terminated by a sharp rising point, opening with two valves, having one row of roundish seeds.

The Species are,

1. PISUM stipulis infernè rotundatis crenatis, petiolis teretibus, pedunculis multifloris. *Hort. Upsal.* 215. Pea, whose lower stipulæ are roundish, indented, with taper foot-stalks, and many flowers on a foot-stalk; greater Garden Pea.

2. PISUM caule erecto ramoso, foliis bijugatis, foliolis rotundioribus. Pea with an erect branching stalk, and leaves having two pair of round lobes; Dwarf Pea.

3. PISUM stipulis quadrifidis acutis, pedunculis multifloris terminalibus. Pea with four-pointed acute stipulæ, and foot-stalks bearing many flowers, which terminate the stalks; the Rose or Crown Pea.

4. PISUM petiolis supra planiusculis, caule angulato, stipulis sagittatis, pedunculis multifloris. *Flor. Suec.* 608. Pea with foot-stalks, which are plain on their upper side, an angular stalk, arrow-pointed stipulæ, and foot-stalks bearing many flowers.

5. PISUM caule angulato procumbente, foliolis inferioribus lanceolatis acutè dentatis, summis sagittatis. Pea with an angular trailing stalk, whose lower leaves are spear-shaped, sharply indented, and those at the top arrow-pointed; commonly called *Cape Horn* Pea.

6. PISUM petiolis decurrentibus membranaceis diphyllis, pedunculis unifloris. *Hort. Cliff.* 370. Pea with membranaceous running foot-stalks, having two leaves, and one flower upon a foot-stalk.

There is a great variety of garden Peas now cultivated in *England*, which are distinguished by the gardeners and seedsmen, and have their different titles; but as great part of these have been seminal variations, so if they are not very

carefully managed, by taking away all those plants which have a tendency to alter, before the seeds are formed, they will degenerate into their original state, therefore all those persons who are curious in the choice of their seeds, look carefully over those which they design for seeds at the time when they begin to flower, and draw out all the plants which they dislike from the other. This is what they call Roguing their Peas, meaning hereby, the taking out all the bad plants from the good, that the farina of the former may not impregnate the latter; to prevent which, they always do it before the flowers open; by thus diligently drawing out the bad, reserving those which come earliest to flower, they have greatly improved their Peas of late years, and are constantly endeavouring to get forwarder varieties; so that it would be to little purpose in this place, to attempt giving a particular account of all the varieties now cultivated; therefore I shall only mention their titles by which they are commonly known, placing them according to their time of coming to the table, or gathering for use.

The Golden Hotspur.	Nonpareil.
The Charlton.	Sugar Dwarf.
The Reading Hotspur.	Sickle Pea.
Masters's Hotspur.	Marrowfat.
Essex Hotspur.	Rose, or Crown Pea.
The Dwarf Pea.	Rouncival Pea.
The Sugar Pea.	Gray Pea.
Spanish Morotto.	Pig Pea, with some others.

The *English* Sea Pea is found wild upon the shore in *Suffex*, and several other counties in *England*, and is undoubtedly a different species from the common Pea.

The fifth sort hath a biennial root, which continues two years. This was brought from *Cape Horn* by *Lord Anson's* cook, when he passed that *Cape*, where these Peas were a great relief to the sailors. It is kept here as a curiosity, but the Peas are not so good for eating as the worst sort now cultivated in *England*; it is a low trailing plant; the leaves have two lobes on each foot-stalk; those below are spear-shaped, and sharply indented on their edges, but the upper leaves are small and arrow-pointed. The flowers are blue, each foot-stalk sustaining four or five flowers; the pods are taper, near three inches long, and the seeds are round, about the size of *Tares*.

The sixth sort is annual. This grows naturally among the Corn in *Sicily* and some parts of *Italy*, but is here preserved in botannick gardens for the sake of variety. It hath an angular stalk rising near three feet high; the leaves stand upon winged foot-stalks, each sustaining two oblong lobes. The flowers are of a pale yellow colour, shaped like those of the other sorts of Pea, but are small, each foot-stalk sustaining one flower; these are succeeded by pods about two inches long, containing five or six roundish seeds, which are a little compressed on their sides. These are by some persons eaten green, but unless they are gathered very young they are coarse, and at best not so good as the common Pea. It may be sown and managed in the same way as the garden Pea.

I shall now proceed to set down the method of cultivating the several sorts of garden Peas, so as to continue them throughout the season.

It is a common practice with the gardeners near *London*, to raise Peas upon hot-beds, to have them very early in the spring; in order to which, they sow their Peas upon warm borders, under walls or hedges, about the middle of *October*; and when the plants come up, they draw the earth up gently to their stems with a hoe, the better to protect them from frost. In these places they let them remain until the latter end of *January*, or the beginning of *February*, observing to earth

earth them up from time to time, as the plants advance in height (for the reasons before given); as also to cover them in very hard frost with Peas haulm, Straw, or some other light covering, to preserve them from being destroyed; then, at the time before-mentioned, they make a hot-bed (in proportion to the quantity of Peas intended) which must be made of good hot dung well prepared and properly mixed together, that the heat may not be too great. The dung should be laid from two to three feet thick, according as the beds are made earlier or later in the season; when the dung is equally levelled, then the earth (which should be light and fresh, but not over-rich) must be laid thereon about six or eight inches thick, laying it equally all over the bed. This being done, the frames (which should be two feet high on the back side, and about fourteen inches in front) must be put on, and covered with glasses; after which it should remain three or four days, to let the steam of the bed pass off, before you put the plants therein; observing every day to raise the glasses, to give vent for the rising steam to pass off; then when you find the bed of a moderate temperature for heat, you should, with a trowel, or some other instrument, take up the plants as carefully as possible, to preserve the earth to their roots, and plant them into the hot-bed in rows, about two feet asunder, and the plants about an inch distant from each other in the rows, observing to water and shade them until they have taken root; after which you must be careful to give them air, at all times when the season is favourable, otherwise they will draw up very weak, and be subject to grow mouldy and decay. You should also draw the earth up to the shanks of the plants, as they advance in height, and keep them always clear from weeds. The water they should have, must be given them sparingly, for if they are too much watered, it will cause them to grow too rank, and sometimes rot off the plants at their shanks, just above ground. When the weather is very hot, you should cover the glasses with mats in the heat of the day, to screen them from the violence of the sun, which is then too great for them: but when the plants begin to fruit, they should be watered oftener, and in greater plenty than before; for by that time the plants will have nearly done growing, and the often refreshing them will occasion their producing a greater plenty of fruit.

The sort of Pea, which is generally used for this purpose, is the Dwarf, for all the other sorts ramble too much to be kept in frames; the reason for sowing them in the common ground, and afterwards transplanting them on a hot-bed, is to check their growth, and cause them to bear in less compass; for if the seeds were sown upon a hot-bed, and the plants continued thereon, they would produce such luxuriant plants as are not to be contained in the frames, and would bear but little fruit.

The next sort of Pea, which is sown to succeed those on the hot-bed, is the Hotspur, of which there are reckoned several sorts; as the Golden Hotspur, the *Charlton* Hotspur, the Master's Hotspur, the *Reading* Hotspur, and some others; which are very little differing from each other, except in their early bearing, for which the Golden and *Charlton* Hotspurs are chiefly preferred; though if either of these sorts are cultivated in the same place for three or four years, they are apt to degenerate, and be later in fruiting; for which reason, most curious persons procure their seeds annually from some distant place; and in the choice of these seeds, if they could be obtained from a colder situation and a poorer soil, than that in which they are to be sown, it will be much better than on the contrary, and they will come earlier in the spring.

These must also be sown on warm borders, toward the latter end of *October*; and when the plants are come up,

you should draw the earth up to their shanks in the manner before directed, which should be repeated as the plants advance in height (always observing to do it when the ground is dry) which will greatly protect the stems of the plants against frost; and if the winter should prove very severe, it will be of great service to the plants to cover them with Peas haulm, or some other light covering, which should be constantly taken off in mild weather, and only suffered to remain on during the continuance of the frost; for if they are kept too close, they will draw up very weak and tender, and thereby be liable to be destroyed with the least inclemency of the season.

In the spring you must carefully clear them from weeds, and draw some fresh earth up to their stems, but do not raise it too high to the plants, lest by burying their leaves you should rot their stems, as is sometimes the case, especially in wet seasons. You should also observe to keep them clear from vermin, which, if permitted to remain amongst the plants, will increase so plentifully, as to devour the greatest part of them. The chief of the vermin, which infect Peas, are the slugs, which lie all the day in the small hollows of the earth, near the stems of the plants, and in the night time come out, and make terrible destruction of the Peas; and these chiefly abound in wet soils, or where a garden is neglected, and over-run with weeds; therefore you should make the ground clear every way round the Peas to destroy their harbours, and afterwards in a fine mild morning very early; when these vermin are got abroad from their holes, you should slack a quantity of lime, which should be sown hot over the ground pretty thick, which will destroy the vermin, where-ever it happens to fall upon them, but will do very little injury to the Peas, provided it be not scattered too thick upon them. This is the best method I could ever find to destroy these troublesome vermin.

If this crop of Peas succeeds, it will immediately follow those on the hot-bed; but for fear this should miscarry, it will be proper to sow two more crops at about a fortnight or three weeks distance from each other, so that there may be the more chances to succeed. This will be sufficient until the spring of the year, when you may sow several more crops of these Peas at a fortnight distance from each other. The late sowings will be sufficient to continue the early sort of Peas through the season, but it will be proper to have some of the large sort of Peas to succeed them for the use of the family; in order to which you should sow some of the *Spanish* Morotto, which is a great bearer, and a hardy sort of Pea, about the middle of *February*, upon a clear open spot of ground. These must be sown in rows about four feet asunder, and the Peas should be dropped in the drills about an inch distance, covering them about two inches deep with earth, being very careful that none of them lie uncovered, which will draw the mice, pigeons, or rooks, to attack the whole spot; and it often happens, by this neglect, that a whole plantation is devoured by these creatures; whereas, when there are none of the Peas left in sight, they do not so easily find them out.

About a fortnight after this, you should sow another spot, either of this sort, or any other large sort of Pea, to succeed those, and then continue to repeat sowing once a fortnight, till the middle or latter end of *May*, only observing to allow the Marrowfats, and other very large sorts of Peas, at least four feet and a half between row and row; and the Rose Pea should be allowed at least eight or ten inches distance plant from plant in the rows, for these grow very large, and if they have not room allowed them, they will spoil each other by drawing up very tall, and will produce no fruit.

When these plants come up, the earth should be drawn up to their shanks (as was before directed), and the ground kept entirely clear from weeds; and when the plants are grown eight or ten inches high, you should stick some Brushwood, into the ground close to the Peas, for them to ramp upon, which will support them from trailing upon the ground, which is very apt to rot the large growing sorts of Peas, especially in wet seasons; besides, by thus supporting them, the air can freely pass between them, which will preserve the blossoms from falling off before their time, and occasion them to bear much better, than if permitted to lie upon the ground, and there will be room to pass between the rows to gather the Peas when they are ripe.

The dwarf sorts of Peas may be sown much closer together than those before-mentioned, for these seldom rise above a foot high, and rarely spread above half a foot in width, so that these need not have more room than two feet row from row, and not above an inch asunder in the row. These will produce a good quantity of Peas, provided the season be not over-dry, but they seldom continue long in bearing, so that they are not so proper to sow for the main crop, when a quantity of Peas is expected for the table, their chief excellency being for hot-beds, where they will produce a greater quantity of Peas (provided they are well managed) than if exposed to the open air, where the heat of the sun soon dries them up.

The Sickle Pea is much more common in *Holland* than in *England*, it being the sort mostly cultivated in that country; but in *England* they are only propagated by curious gentlemen for their own table, and are rarely brought into the markets. This sort the birds are very fond of, and if they are not prevented, many times destroy the whole crop. This should be planted in rows about two feet and a half asunder, and be managed as hath been directed for the other sorts.

Although I have directed the sowing of the large sorts of Peas for the great crop, yet these are not so sweet as the early Hotspur Peas; therefore it will also be proper to continue a succession of those sorts through the season, in small quantities, to supply the best table, which may be done by sowing every fortnight; but all those, which are sown late in the season, should have a strong moist soil, for in hot light land they will burn up, and come to nothing.

The large growing sorts may be cultivated for the common use of the family, because these will produce in greater quantities than the other, and will endure the drought better, but the early kinds are by far the sweeter tasted Peas.

The best of all the large kinds is the Marrowfat, which, if gathered young, is a well-tasted Pea, and this will continue good through the month of *August*, if planted on a strong soil.

The gray and other large winter Peas are seldom cultivated in gardens, because they require a great deal of room, but are usually sown in fields in most parts of *England*. The best time for sowing of these is about the beginning of *March*, when the weather is pretty dry, for if they are put into the ground in a very wet season, they are apt to rot, especially if the ground be cold; these should be allowed at least three feet distance row from row, and must be sown very thin in the rows; for if they are sown too thick, the haulm will spread so as to fill the ground, and ramble over each other, which will cause the plants to rot, and prevent their bearing.

The common white Pea will do best on light sandy land, or on a rich loose soil. The usual method of sowing these Peas is with a broad cast, and so harrow them in; but it is a much better way to sow them in drills about three feet asunder, for half the quantity of seed will do for an acre, and being set regularly, the ground may be stirred with a

hoe to destroy the weeds, and earth up the Peas, which will greatly improve them, and the Peas may be much easier cut in autumn, when they are ripe. The usual time for sowing of these Peas is about the middle or latter end of *March*, on warm land, but on cold ground they should be sown a fortnight or three weeks later. In the common way of sowing, they allow three bushels or more to an acre, but if they are drilled, one bushel will be full enough.

The Green and Maple Rouncivals require a stronger soil than the white, and should be sown early in the spring; also the drills should be made at a greater distance from each other, for as these are apt to grow rank, especially in a wet season, they should be set in rows three feet and a half, or four feet asunder; and the ground between the rows should be stirred two or three times with a hoe, which will not only destroy the weeds, but, by earthing up the Peas, greatly improve them, and also render the ground better to receive whatever crop is put on it the following season.

The gray Peas thrive best on a strong clayey land; these are commonly sown under furrow, but by this method they are always too thick, and do not come up regular; therefore all these rank-growing plants should be sown in drills, where the seeds will be more equally scattered, and lodged at the same depth in the ground; whereas in the common way, some of the seeds lie twice as deep as others, and are not scattered at equal distances. These may be sown toward the end of *February*, as they are much hardier than either of the former sorts, but the culture for these should be the same.

The best method to sow these Peas is to draw a drill with a hoe by a line about two inches deep, and then scatter the seeds therein; after which, with a rake you may draw the earth over them, whereby they will be equally covered: this is a very quick method for gardens, but where they are sown in fields, they commonly make a shallow furrow with the plough, and scatter the seeds therein, and then with a harrow they cover them over again. After this, the great trouble is to keep them clear from weeds, and draw the earth up to the plants; this, in such countries where labour is dear, is a great expence to do it by the hand with a hoe; but this may be easily effected with a small plough, which may be drawn through between the rows, which will entirely eradicate the weeds, and by stirring the soil, render it mellow, and greatly promote the growth of the plants.

When any of these sorts are intended for seed, there should be as many rows of them left ungathered, as may be thought necessary to furnish a sufficient quantity of seed; and when the Peas are in flower, they should be carefully looked over to draw out all those plants which are not of the right sort, for there will always be some roguish plants (as the gardeners term them) in every sort, which, if left to mix, will degenerate the kind. These must remain until their pods are changed brown, and begin to split, when you should immediately gather them up, together with the haulm; and if you have not room to stack them till winter, you may thresh them out as soon as they are dry, and put them up in sacks for use; but you must be very careful not to let them remain too long abroad after they are ripe, for if wet should happen, it would rot them, and heat, after a shower of rain, would cause their pods to burst, and cast forth their seeds, so that the greatest part of them would be lost; but, as I said before, it is not advisable to continue sowing of the same seed longer than two years, for the reasons there laid down, but rather to exchange their seeds every year, or every two years at least, whereby you may always expect to have them prove right.

PISUM CORDATUM. See *Cardiospermum*.

PITTONIA. See *Tournefortia*.

PLANTA, a plant, is defined by the ingenious Mr. *John Martyn* to be an organical body, destitute of sense, and spontaneous motion, adhering to another body in such a manner, as to draw from it its nourishment, and having power of propagating itself by seed. As to the parts, of which a plant consists, they are the root, stalk, leaf, flower, and fruit.

PLANTAGO. *Tourn. Inst. R. H.* 126. tab. 48. Plantain.

To this genus Dr. *Linnaeus* has joined the *Coronopus* and *Psyllium* of *Tournefort*. The first of these is called Hartshorn, the latter Fleawort. Of these there are several distinct species, and some varieties, but as they are rarely cultivated in gardens, I shall not enumerate them here, and shall only mention such of them as grow naturally in *England*. Of the Plantain there are the following sorts; the common broad-leaved Plantain, called Weybread; the great hoary Plantain, or Lamb-tongue; the narrow-leaved Plantain, or Ribwort, and the following varieties have also been found in *England*, which are accidental; the Besom Plantain, and Rose Plantain. The Plantains grow naturally in pastures in most parts of *England*, and are frequently very troublesome weeds. The common Plantain, and Ribwort Plantain, are both used in medicine, and are so well known as to need no description.

Of the *Coronopus*, or Buckshorn Plantain, there are two varieties growing in *England*, viz. the common Buckshorn, which grows plentifully on heaths every where, and the narrow-leaved *Welsh* sort, which is found upon many of the *Welsh* mountains. The first of these was formerly cultivated as a salad herb in gardens, but has been long banished from thence for its rank disagreeable flavour; it is sometimes used in medicine. There has been one species of *Psyllium*, or Flea-wort, found growing naturally in *England*, which is the sort used in medicine: this was found in the earth, thrown out of the bottom of the canals, which were dug for the *Chelsea* water-works, where it grew in great plenty. The seeds of this must have been buried there some ages, for no person remembers any of the plants growing in that neighbourhood before. The seeds of this are sometimes used, which are imported from the south of *France*.

PLANTAIN-TREE. See *Musa*.

PLANTING. Although the method of planting the various sorts of trees is fully set down under the several articles, where each kind is mentioned; yet it may not be amiss to say something in general upon that head in this place, which shall be set down as briefly as possible. And,

First, The first thing in the planting of trees is to prepare the ground (according to the different sorts of trees you intend to plant) before the trees are taken out of the earth; for you should suffer them to remain as little time out of the ground as possible.

In taking up the trees, you should carefully dig away the earth round their roots, so as to come at their several parts to cut them off; for if they are torn out of the ground without care, the roots will be broken and bruised very much to the great injury of the trees. When you have taken them up, the next thing is to prepare them for planting; in doing of which there are two things to be principally regarded; the one is to prepare the roots, and the other to prune their heads in such a manner as may be most serviceable in promoting the future growth of the trees.

And first as to the roots; all the small fibres are to be cut off as near to the place from whence they are produced as may be (excepting ever-greens, and such trees as are to be replanted immediately after they are taken up); otherwise the air will turn all the small roots and fibres black, which, if permitted to remain on when the tree is planted, will grow mouldy, and decay, and thereby greatly injure the new fibres which are produced, so that many times the trees

miscarry for want of duly observing this. After the fibres are cut off, you should prune off all the bruised or broken roots smooth, otherwise they are apt to rot, and disemper the trees; you should also cut out all irregular roots which cross each other, and all downright roots (especially in fruit trees) must be cut off; so that when the roots are regularly pruned, they may in some measure resemble the fingers of a hand when spread open; then you should shorten the larger roots in proportion to the age and strength of the tree, as also the particular sorts of trees are to be considered; for the Walnut, Mulberry, and some other tender-rooted kinds, should not be pruned so close, as the more hardy sorts of fruit or forest trees, which in young fruit trees, such as Pears, Apples, Plums, Peaches, &c. that are one year old from budding or grafting, may be left about eight or nine inches long, but in older trees they must be left of a much greater length; but this is to be understood of the larger roots only, for the small ones must be cut quite out, or pruned very short. Their extreme parts, which are generally very weak, commonly decay after moving, so that it is the better way entirely to displace them.

The next thing is the pruning of their heads, which must be differently performed in different trees, and the design of the trees must also be considered; for if they are fruit trees, and intended for walls or espaliers, it is the better way to plant them with the greatest part of their heads, which should remain on until the spring, just before the trees begin to shoot; when they must be cut down to five or six eyes (as is fully set down in the several articles of the various kinds of fruit), being very careful, in doing of this, not to disturb the new roots.

But if the trees are designed for standards, you should prune off all the small branches close to the places where they are produced, as also irregular branches which cross each other; and by their motion, when agitated by the wind, rub and bruise their bark, so as to occasion many times great wounds in those places; besides, it makes a disagreeable appearance to the sight, and adds to the closeness of its head, which should be always avoided in fruit trees, whose branches should be preserved as far distant from each other, as they are usually produced when in a regular way of growth (which is in all sorts of trees proportionable to the size of their leaves, and magnitude of their fruit). But to return: After having displaced these branches, you should also cut off all such parts of branches as have by any accident been broken or wounded; for these will remain a disagreeable sight, and often occasion a disease in the tree. But you should by no means cut off the main leading shoots, as is by too many practised, for those are necessary to attract the sap from the root, and thereby promote the growth of the tree.

Having thus prepared the trees for planting, we must now proceed to the placing them into the ground; but before this, I would advise, if the trees have been long out of the ground, so that the roots are dried, to place them in water eight or ten hours before they are planted, observing to put them in such manner, that their heads may remain erect, and their roots only immersed therein, which will swell the dried vessels of the roots, and prepare them to imbibe nourishment from the earth. In fixing of them, great regard should be had to the nature of the soil, which, if cold and moist, the trees should be planted very shallow; as also, if it be a hard rock or gravel, it will be much the better way to raise a hill of earth where each tree is to be planted, than to dig into the rock or gravel, and fill it up with earth (as is too often practised), whereby the trees are planted, as it were in a tub, there being but little room for their roots to extend; so that after two or three years growth, when their roots have extended to the sides of the

hole, they are stopped by the rock or gravel, can get no farther, and the trees will decline, and in a few years die. But when they are raised above the surface of the ground, their roots will extend, and find nourishment, though the earth upon the rock or gravel be not three inches thick, as may be frequently observed, where trees are growing upon such soils.

Having thus planted the trees, you should provide a parcel of stakes, which should be driven down by the sides of the trees, and fastened thereto to support them from being blown down, or displaced by the wind, and then lay some mulch upon the surface of the ground, about their roots, to prevent the earth from drying.

This is to be understood of standard trees, which cast their leaves, for such as are planted against walls, should have their branches fastened to the wall to prevent the trees being displaced by the wind, and place their roots about five inches from the wall, inclining their heads thereto; and the spring following, just before they shoot, their heads should be cut down to five or six buds, as is fully directed under the several articles of the different kinds of fruit.

As to the watering of all new-planted trees, I should advise it to be done with great moderation, nothing being more injurious to them than over-watering. Examples enough of this kind may have been seen in many parts of *England*; and by an experiment made by the late Rev. Dr. *Hales*, in placing the roots of a dwarf Pear-tree in water, the quantity of moisture imbibed decreased very much daily, because the sap-vessels of the roots, like those of the cut-off boughs in the same experiment, were so saturated and clogged with moisture, by standing in water, that more of it could not be drawn up. And this experiment was tried upon a tree, which was full of leaves, and thereby more capable to discharge a large quantity of moisture than such trees as are entirely destitute of leaves; so that it is impossible such trees can thrive, where the moisture is too great about their roots.

The distance which trees should be planted at, must be proportioned to their several kinds, and the several purposes for which they are intended, all which is explained under their several heads; but fruit-trees, planted either against walls, or for espaliers, should be allowed the following distances: for most sorts of vigorous-shooting Pear-trees, thirty-six or forty feet; for Apricots, sixteen or eighteen feet; Apples, twenty-five or thirty feet; Peaches and Nectarines, twelve feet; Cherries and Plums, twenty-five feet, according to the goodness of the soil, or the height of the wall. But as these things are mentioned in their several articles, it will be needless to repeat any more in this place.

It is common to hear persons remarking, that from the present spirit of planting, great advantages will accrue to the publick by the increase of timber; but whoever is the least skilled in the growth of timber must know, that little is to be expected from most of the plantations which have lately been made; for there are few persons who have had this in their view when they commenced planters, and of those few scarce any of them have set out right, for there never was any valuable timber produced from trees which were transplanted of any considerable size, nor is any of the timber of the trees which are transplanted young, equal in goodness to that which has grown from the seeds unremoved. Beside, if we consider the sorts of trees which are usually planted, it will be found, that they are not designed for timber; so that upon the whole, it is much to be doubted, whether the late method of planting has not rather been prejudicial to the growth and increase of timber, than otherwise.

Before I quit this subject of planting, I must beg leave to observe, that most people are so much in a hurry about planting, as not to take time to prepare their ground for the

reception of trees, but frequently make holes and stick in the trees, amongst all sorts of rubbish which is growing upon the land: and I have frequently observed, that there has not been any care afterward taken to dig the ground, or root out the noxious plants; but the trees have been left to struggle with these bad neighbours, which have had long possession of the ground, and have established themselves so strongly, as not to be easily overcome; therefore what can be expected from such plantations? This is to be understood of deciduous trees, for the Pines and Firs, if once well rooted in the ground, will soon get the better of the plants and destroy them.

Therefore I would advise every person who proposes to plant, to prepare the ground well before-hand, by trenching or deep ploughing it, and clearing of it from the roots of all bad weeds; for by so doing there will be a foundation laid for the future success of the plantation. Also I advise no person to undertake more of this work than he can afterward keep clean, for all plantations of deciduous trees will require this care, at least for seven years after they are made, if they hope to see the trees thrive well. Therefore all small plantations should have the ground annually dug between the trees; and as to those which are large, it should be ploughed between them. This will encourage the roots of the trees to extend themselves, whereby they will find a much greater share of nourishment, and by loosening of the ground, the moisture and air will more easily penetrate to the roots, to the no small advantage of the trees. But besides this operation, it will be absolutely necessary to hoe the ground three or four times in summer, either by hand or the hoe-plough. This I am aware will be objected to by many, on account of the expence; but if the first hoeing is performed early in the spring, before the weeds have gotten strength, a great quantity of ground may be gone over in a short time; and if the season is dry when it is performed, the weeds will presently die after they are cut; and if this is repeated before the weeds come up again to any size, it will be found the cheapest and very best husbandry, for if the weeds are suffered to grow till they are large, it will be a much greater expence to root them out, and make the ground clean; beside, the weeds will rob the trees of great part of their nourishment. I have sometimes been told, that it is necessary to let the weeds grow among trees in summer, in order to shade their roots, and keep the ground moist; but this has come from persons of no skill; but as others may have been deceived by such advice, I imagine it may not be improper to give some answer to this. And here I must observe, that if weeds are permitted to grow, they will draw away all moisture from the roots of the trees, for their own nourishment, so that the trees will be thereby deprived of the kindly dews and gentle showers of rain, which are of great service to young plantations; and these will be entirely drawn away by the weeds, which will prevent their penetrating of the ground, so that it is only the great rains which can descend to the roots of the trees. And whoever has the least doubt of this matter, if they will but try the experiment, by keeping one part of the plantation clean, and suffer the weeds to grow on another, they will soon be convinced of the truth by the growth of the trees. And though this cleaning is attended with an expence, yet the success will overpay this, beside the additional pleasure of seeing the ground always clean.

PLATANUS. *Tourn. Inst. R. H. 590. tab. 363.* The Plane-tree.

The Characters are,

It hath male and female flowers growing separate on the same tree. The male flowers are collected in a round ball; they have no petals, but have oblong coloured stamina, which are terminated

by four-cornered summits. The female flowers have small scaly empalements, and several small concave petals, with several awl-shaped germen sitting upon the styles, crowned by recurved stigmas; these are collected in large balls. The germen afterward turns to a roundish seed sitting upon the bristly style, and surrounded with downy hairs.

The Species are,

1. *PLATANUS foliis palmatis*. Hort. Cliff. 447. Plane-tree with hand-shaped leaves; or Eastern Plane-tree.

2. *PLATANUS foliis lobatis*. Hort. Cliff. 447. Plane-tree with lobated leaves; Occidental, or *Virginian* Plane-tree.

These two are undoubtedly distinct species, but there are two others in the *English* gardens, which I suppose to be varieties that have accidentally risen from seed; one is titled the *Maple-leaved* Plane-tree, and the other is called the *Spanish* Plane-tree.

The first sort grows naturally in *Asia*. This rises to a very great height; the stem is tall, erect, and covered with a smooth bark, which annually falls off; it sends out many side branches, which are generally a little crooked at their joints; the bark of the young branches is of a dark brown, inclining to a purple colour, which are garnished with leaves placed alternate; their foot-stalks are long; the leaves are broad, deeply cut into five segments, and the two outer are slightly cut again into two more; these segments have many acute indentures on their borders; the upper side of the leaves are of a deep green, and the under side pale. The flowers come out upon long foot-stalks or ropes hanging downward, each sustaining five or six round balls of flowers; the upper, which are the largest, are more than four inches in circumference; these sit very close to the foot-stalks. The flowers are so small, as scarce to be distinguished without glasses; they come out at the same time as the leaves, which is in *June*, and in warm summers the seeds will ripen late in autumn, and if left upon the trees, will remain till spring, when the balls fall to pieces, and the bristly down which surrounds the seeds, help to transport them to a great distance with the wind.

The second sort grows naturally in most parts of *North America*. This tree also grows to a large size; the stem very strait, and of equal girt most part of the length; the bark is smooth, and annually falls off like that of the other; the foot-stalks of the leaves are long; the leaves are broad, and are cut into angles, having several acute indentures on their borders, with three longitudinal midribs. They are of a light green on their upper side, and paler on their under. The flowers grow in round balls like the former, but are smaller. The leaves and flowers come out at the same time with the former, and the seeds ripen in autumn.

That which is called the *Maple-leaved* Plane, is certainly a femal variety of the Eastern Plane, for the seeds which scattered from a large tree of this kind in the *Chelsea* garden, have produced plants of that sort several times. This differs from the two sorts before mentioned, in having its leaves not so deeply cut as those of the Eastern Plane, but they are much deeper cut than those of the Occidental Plane. The foot-stalks of the leaves are much longer than those of either of the former, and the upper surface of the leaves is rougher, so that any person might take them for different species, who had not seen them rise from the same seeds.

The *Spanish* Plane-tree has larger leaves than either of the other sorts, which are more divided than those of the Occidental Plane tree, but not so much as the Eastern. Some of the leaves are cut into five, and others but three lobes; these are sharply indented on their edges, and are of a light green. This is by some called the middle Plane-tree, from its leaves being shaped between those of the two other sorts. It grows rather faster than either of the other sorts, but I have not seen any very large trees of this kind.

The first sort was brought out of the *Levant* to *Rome*, where it was cultivated with much cost and industry: the greatest orators and statesmen among the *Romans* took great pleasure in their villas, which were surrounded with *Platani*; and their fondness for this tree became so great, that we frequently read of their irrigating them with wine instead of water. *Pliny* affirms, that there is no tree whatsoever which so well defends us from the heat of the sun in summer, nor that admits it more kindly in winter, the branches being produced at a proportionable distance to the largeness of their leaves; so that when the leaves are fallen in winter, the branches growing at a great distance, easily admit the rays of the sun.

It is generally supposed, that the introduction of this tree into *England*, is owing to the great Lord Chancellor *Bacon*, who planted a noble parcel of them at *Verulam*, which were there very flourishing some years since, but have lately been destroyed.

However, notwithstanding the Plane-tree is backward in coming out in the spring, and the leaves decaying soon in autumn, yet for the goodly appearance and great magnitude to which it will grow, it deserves a place in large plantations, or shady recesses near habitations, especially if the plantation be designed on a moist soil, or near rivulets of water, in which places this tree will arrive to a prodigious magnitude.

The Eastern Plane-tree is propagated either from seeds, or by layers, the latter of which is generally practised in *England*; though the plants thus raised seldom make so large strait trees, as those which are produced from seeds; but it has been generally thought, that the seeds of this tree were not productive, because they have not been sown at a proper season, nor managed in a right manner; for I have had thousands of the young plants spring up from the seeds of a large tree, which scattered upon the ground in a moist place; and I since find, that if these seeds are sown soon after they are ripe, in a moist shady situation, they will rise extremely well; and the plants thus obtained, will make a considerable progress after the second year, being much hardier and less liable to lose their tops in winter, than those which are propagated by layers. And since the seeds of this tree ripen well in *England*, they may be propagated in as great plenty as any other forest tree.

The *Virginian* Plane-tree will grow extremely well from cuttings, if they are planted the beginning of *October* upon a moist soil, and if they are watered in dry weather, will make a prodigious progress; so that in a few years from the planting, they will afford noble trees for planting of avenues, and other shady walks; and their trunks are perfectly strait, growing nearly of the same size to a considerable height, there being the least difference in the girt of this tree, for several yards upwards, of any other sort of tree whatsoever.

They are all propagated very easily by layers, every twig of them will take root, if they are but covered with earth; these layers will be well rooted in one year, when they should be cut off from the old trees or stools, and planted in a nursery, where they may remain two or three years to get strength, and then transplanted where they are to remain, for the younger these trees are planted, the better they will thrive. An experiment of this I made in 1731, when I planted one of these trees, whose stem was eight inches in girt, and near it, in the same soil and situation, I planted another, whose girt was not three inches, and the latter is now much larger than the former, and gains more in one year than the other does in three.

PLOWING OF LAND.

There is not a greater improvement of arable land than that of well ploughing it, by which the soil is pulverized,

verized, and rendered fit to receive the fibres of plants; the oftener this is repeated, and the better it is performed, the greater improvement is made. But there are not many of the practitioners of the art of husbandry, who attend enough to this part of it, most of them contenting themselves with going on in the old beaten road of their predecessors; so that the only persons, who have made any considerable improvement in this part of agriculture, are the great gardeners, who cultivate most of their land with the plough, in which they have imitated, as near as possible, the use of the spade in labouring of their ground.

The difference between digging of land with the spade, and that of ploughing, consists in the parts of the earth being much more divided by the former than the latter method; therefore those gardeners, who are curious in the working of their land, oblige their labourers to spit the ground as thin as possible, that there may remain no large clods unbroken; so, when land is ploughed, the same regard should be had to break and pulverize the parts as much as possible; for when there are great clods left unbroken, the fibres of plants never penetrate farther than the surface of them; so that all the salts, included in these lumps of earth, are locked up, that the plants can receive no benefit from them. And these clods, in proportion to their size, make such interstices, that the air often penetrates through, and greatly injures the tender fibres of the roots. Therefore the oftener the land is ploughed, and the more the parts are separated and pulverized, by the plough and harrow, the better will the plants be nourished and fed; but, particularly in all strong land, this part of husbandry will be the most beneficial, but this cannot be effected under four or five ploughings, and by using such ploughs as have either two or four colters, which will cut and separate the clods much better than it can be performed by the common plough; and in the operation, great care should be had to the breadth of the furrow, for when these are made too broad, it will be impossible to break and separate the parts sufficiently. In some counties, where the husbandmen are not very expert in the use of the plough, I have seen gentlemen oblige them to plough by a line, and they have set out the exact width of each furrow. This not only adds a neatness to the ground, but likewise by keeping the furrows strait, and at equal distances, the land will be more equally worked; but many of the good ploughmen, in the counties near *London*, will direct the plough as strait by their eye, as if they were to use a line.

Another thing to be observed in ploughing of land is, that of going to a proper depth; for if the surface only be broken up and pulverized, the roots of whatever plants are sown or planted in it, will in a very short time reach the bottom, and meeting with the hard unbroken soil, they are stopped from getting farther, and of consequence the plants will stint in their growth; for there are few persons who have attended enough to the downright growth of the roots of plants; they only have had regard to the roots of those plants, which are of a strong fleshy substance, and are called Tap-roots, being in form of Carrots. These they suppose will require to have the land wrought to a greater depth, that the roots may run down, and be the longer; for in that particular their goodness consists. But they do not think that the small fibrous rooted plants ever require so much depth to run into the ground, and in this they are greatly mistaken; for I have traced the small fibres of Grass and Corn above three feet deep in the ground. And if any person is curious to observe the length of the fibres of plants, if they will but plant one of each sort into a small pot of earth, and keep them duly watered, till the plants are advanced to flower, and then turn them out of the pots carefully, so as not to break any of the fibres of the roots, and

after separating the earth from them, measure the length of their roots, they will be found much greater than most people imagine. I have myself frequently traced the roots of plants, which have surrounded the pots upward of twelve times, and the roots of some strong-growing plants, which have gotten through the holes in the bottom of flower-pots, have in three months time extended themselves ten or eleven feet from the plant; therefore the deeper the ground is laboured, the greater benefit the plants will receive from it; but it must be understood only of such land as the staple is deep enough to admit of this, for if the soil is shallow, and either gravel, chalk, or stone lie beneath, it will be very imprudent to turn up either of these; therefore the depth of the furrows in such lands must be determined by the staple of the land. By the word Staple must be understood all that depth of soil next the surface, which is proper for the growth of vegetables. Where clay is next the staple, provided it is not of the blue or ironmould sort, there will not be the same danger of going a little deeper than the staple, as in either of the before mentioned sorts of land; for if the clay be of a fat nature, when it hath been well exposed to air, and often laboured, it will be capable of affording a large share of nourishment to the crops.

If between each ploughing of the land a harrow with long teeth is made use of to tear and break the clods, it will be of great service to the land, especially if it is strong, for the more it is stirred by different instruments, the better will the parts be separated and pulverized; so that the common method, as practised by the farmers when they fallow their land, is far from answering their intention, for they plough up the ground, leaving it in great clods for some months, and frequently, during this time, Thistles and all bad weeds are suffered to grow upon the land, and exhaust the goodness of it, and perhaps, just before the seeds are sown, they give it two more ploughings. This is what the farmers call good husbandry, but if instead of this method they would labour the ground often with the plough, a harrow, and heavy roller, to break and separate the parts, and never suffer any weeds to grow upon the land, during its lying fallow, I am sure they would find their account in it; first, by the growth and increase of their crops, and afterward by a saving in the weeding; for if no weeds are suffered to grow to shed their seeds, during the time of fallowing the land, there will but few come up when the ground is sown, in comparison with what would otherwise, in the common husbandry.

PLUMBAGO. *Journ. Inst. R. H.* 140. *tab.* 58. *Lin. Gen. Plant.* 196. Leadwort.

The Characters are,

The flower has a tubulous permanent empalement, which is indented at the top in five parts; it hath one funnel-shaped petal, with a cylindrical tube, narrow at the top. The brim is cut into five oval parts; it has five awl-shaped stamina, situated in the tube, sitting upon the valves of the nectarium, which includes the germen. The small oval germen sustains a single style, the length of the tube, crowned by a slender five-pointed stigma. The germen afterward becomes a single oval seed, included in the empalement.

The Species are,

1. PLUMBAGO *foliis amplexicaulibus.* *Hort. Cliff.* 53. Leadwort with leaves embracing the stalks; common Leadwort or Toothwort.

2. PLUMBAGO *foliis petiolatis.* *Hort. Cliff.* 53. Leadwort with leaves having foot-stalks.

The first sort grows naturally in the south of *France*, in *Italy*, and *Spain*. This hath a perennial root, which strikes deep into the ground, from which arise many slender channelled stalks three feet high, garnished with oval spear-shaped leaves, whose base embraces the stalks; they are smooth,

smooth, entire, and of a grayish colour. The upper part of the stalks sends out many slender branches, garnished with small leaves. These, and also the principal stalks, are terminated by tufts of blue flowers, which are small, funnel-shaped, and have pretty long tubes; these are succeeded by oblong, rough, hairy seeds. This plant seldom flowers till *October* in *England*, so never produces ripe seeds here. There is a variety of this with white flowers and pale stalks, which is supposed to have risen from the seeds of the former.

The stalks of these decay in the winter, and new ones come up the following spring; they are propagated here by parting of their roots, which send out heads in plenty. These may be divided at any time, when the weather is mild, from the time the stalks decay, till the roots begin to shoot in the spring; it should have a light soil and a warm situation, otherwise it will not flower here. The roots should be allowed room to spread, and the stalks require support; and if the plants are kept clean from weeds, and the ground between them dug every winter, it is all the culture they require.

The second sort grows naturally in both *Indies*. This is a perennial plant, with a strong fibrous root, from which arise many slender stalks, which grow near four feet high, garnished with smooth, oval, spear-shaped leaves, ending in acute points, placed alternate, standing upon short foot-stalks. The upper part of the stalks divides into small branches, which are garnished with small oval leaves, and terminate in spikes of white flowers, which have long slender tubes, cut into five segments at the brim; these are succeeded by oblong seeds, covered with the prickly empalement. The upper part of the stalk, and the empalements of the flowers, are very glutinous, sticking to the fingers if touched, and the small flies which settle upon them, are fastened, so cannot get off again. This plant is too tender to thrive in the open air in *England*, so requires to be kept in a moderate stove, where they will continue flowering great part of the year, and those flowers, which appear early in the summer, will be succeeded by ripe seeds in autumn.

This is propagated by seeds, which should be sown on a good hot-bed in the spring, where the plants will come up in about five or six weeks. When these are fit to remove, they should be each planted into a separate small pot, and plunged into a hot bed of tan, observing to screen them from the sun, till they have taken new root; afterward they must be treated like other plants from the same country. In the summer they should have a large share of fresh air admitted to them in warm weather, and require water every other day. In winter they should be kept in a moderate temperature of warmth, and must be more sparingly watered. With this management the roots will abide several years, and produce plenty of flowers and seeds.

PLUM-TREE. See *Prunus*.

PLUMERIA. *Tourn. Inst. R. H. 659. tab. 439.* Red Jasmine.

The Characters are,

The flower has a small empalement, divided into five parts; it hath one funnel-shaped petal, with a long tube, cut into five oblong oval segments at the top, which spread open; it hath five awl-shaped stamina, situated in the center of the tube, terminated by summits which close together, and an oblong bifid germen, with scarce any style, crowned by a double acute stigma. The germen afterward becomes a long, swelling, acute-pointed capsule, with one cell, filled with winged seeds, placed over each other like scales of fish.

The Species are,

1. PLUMERIA *foliis ovato-oblongis. Hort. Cliff. 76.* Plumeria with oblong oval leaves; commonly called in the *West-Indies* Red Jasmine.

2. PLUMERIA *foliis ovato-oblongis, ramis patulis, floribus corymbosis.* Plumeria with oblong oval leaves, spreading branches, and flowers growing in a corymbus; called in the *West-Indies* the Japan-tree.

3. PLUMERIA *foliis lanceolatis revolutis, pedunculis supernè tuberosis. Lin. Sp. Plant. 210.* Plumeria with spear-shaped leaves, which turn backward, and the foot-stalks having swellings on the upper side.

4. PLUMERIA *foliis lanceolatis petiolatis obtusis. Lin. Sp. Plant. 210.* Plumeria with spear-shaped obtuse leaves, having foot-stalks.

5. PLUMERIA *foliis lineari-lanceolatis longissimis.* Plumeria with very long, narrow, spear-shaped leaves.

The first sort grows naturally in the *Spanish West-Indies*, from whence it was transplanted into most of the islands, where it is cultivated in the gardens for ornament. It rises to the height of eighteen or twenty feet; the stalk is covered with a dark green bark, having marks where the leaves have fallen off. The stalks are succulent, and abound with a milky juice, but within they are somewhat ligneous. Toward the top they put out a few thick succulent branches, which are garnished at their ends with oval oblong leaves, of a light green colour, having a large midrib, and many transverse veins; these are full of a milky juice. At the ends of the branches come out the flowers in pretty large clusters; they are shaped like those of the Oleander or Rose Bay, having one petal, which is tubulous, and cut into five oval obtuse segments, which spread open; they are of a pale red colour, and have an agreeable odour. When the flowers are past, the germen becomes a long swelling pod, filled with flat winged seeds, lying over each other like the scales of fish. It usually flowers here in *July* and *August*, but is never succeeded by pods in *England*.

The second sort I received from the island of *St. Christopher* by the name of Japan-tree. This sort is very rare in the *English* settlements at present, having been but lately introduced from the *Spanish West-Indies*. It is in leaf and stem very like the first, but the stalks do not rise so high; they divide into strong spreading branches, which are filled with a milky juice; the leaves are of a thicker consistence than those of the first, and their veins are larger; the flowers of this are of a deeper colour, and are produced in much larger clusters. It is very common to have upward of twenty of these flowers open in one bunch, and a number to succeed these as they decay, so as that the clusters have continued in beauty upward of two months, during which time they make a most beautiful appearance in the stove, and have a very agreeable scent.

The third sort grows plentifully at *Campeachy*. This is not near so beautiful as the two former sorts, the flowers being smaller, and produced in less bunches, and are moreover of short duration. But for the beauty of their stems and leaves, and for the sake of variety, they deserve room in every curious collection of plants.

The fourth sort was discovered by *Dr. Houstoun*, growing in great plenty near *Carthage*. This sort produces small white flowers, resembling those of the third, so is less valuable than the two first.

The seeds of the fifth sort were sent me by *Mr. Richard*, gardener to the king of *France* at *Versailles*, but I had no account of the country from whence it was sent. This hath a stalk very like the first sort, but the leaves are nine or ten inches long, and not more than one inch broad; they are thick, succulent, and full of a milky juice, a little roundish at their points. The flowers of this sort are said to be yellow, but as the plants have not yet flowered here, I can give no farther account of them.

All these plants may be propagated by seeds; these should be sown in pots filled with light earth, and plunged into

into a hot-bed of tanners bark; and when the plants are come up about two inches high, they should be transplanted into separate small pots filled with light sandy earth, and plunged into the hot-bed again. They must not have much water, for as all the sorts are very succulent, being full of a milky juice, somewhat like the Euphorbiums, moisture will cause them to rot. In hot weather the plants should have a pretty large share of fresh air admitted to them, by raising the glasses every day, in proportion to the warmth of the season, to prevent their drawing up weak. Toward *Michaelmas*, when the nights begin to be cold, the plants should be removed into the stove, and plunged into the bark-bed, where they must remain during the winter. As these plants all cast their leaves in the middle of winter, and continue destitute of them till about the beginning of *May*, so, during that time, they should be watered very sparingly, because they are in more danger of rotting, while they are in a less active state, by too much moisture, than when they are furnished with leaves, through which the moisture is more freely perspired.

All these sorts are too tender to thrive in the open air of this country in the summer season, therefore should be constantly preserved in the stove, where, in warm weather, they must have a large share of free air, but in cold weather they must be kept very warm. While they are young, it will be proper to continue them in the bark bed, but when they have obtained strength, they may be placed in a dry stove, where they will thrive well, provided they are kept in a moderate temperature of heat, and have not too much water.

These plants may also be propagated by cuttings, which should be taken from the old plants a month or six weeks before they are planted, during which time they should be laid on the flues in the stove, that the part which joined to the old plant may be healed over before they are planted, otherwise they will rot. These cuttings should be planted in small pots filled with light sandy earth, and plunged into a moderate hot-bed of tanners bark. If the cuttings succeed, they will have taken root in about two months, when they should have a larger share of air to harden them by degrees to bear the sun and air, and afterward may be treated as the old plants.

PODOPHYLLUM. *Lin. Gen. Plant.* 571. Ducksfoot, or May Apple.

The Characters are,

The bud of the flower is inclosed in a large three-leaved empalement, in form of a spatha or sheath. It has nine roundish concave petals, plaited on their borders, and smaller than the empalement; it has a roundish germen without a style, crowned by a plaited obtuse stigma. The germen afterward turns to an oval capsule of one cell, crowned by the stigma, filled with roundish seeds.

We have but one Species of this genus in the English gardens, viz.

PODOPHYLLUM foliis peltatis lobatis. *Lin. Sp. Plant.* 505. Ducks-foot with target-shaped leaves having lobes.

This plant grows naturally in many parts of *North America*. The root is composed of many thick tubers, which are fastened together by fleshy fibres, and propagate greatly under ground, sending out many smaller branches, which strike downward. In the spring arise several foot-stalks about six inches high, which divide into two smaller, each sustaining one leaf composed of five, six, or seven lobes, the five middle being deeply indented at the top; these join together at their base, where the foot-stalk meets, which is fastened to the under side of the leaf like the handle of a target; the leaves are smooth, and of a light green. At the division of the foot-stalk comes out the flower with a large empalement, covering it like a sheath; the flower hath

nine pretty large concave white petals, which are roundish at the top, and plaited on their borders. In the center is situated a large, roundish, oval germen, crowned by a plaited obtuse stigma, surrounded by a great number of short stamina, terminated by oblong, erect, yellow summits.

This plant propagates so fast by its creeping roots, as that few persons are at the trouble of sowing the seeds. Every part of the root will grow, so they may be annually parted, either in autumn when their leaves decay, or in the spring just before the roots begin to shoot; they require no other culture but to keep them clean from weeds. It loves a light loamy soil, and a shady situation, and is so hardy as seldom to be injured by frost.

POINCIANA. *Tourn. Inst. R. H.* 619. *tab.* 391. *Barbadoes* Flower fence, or Spanish Carnations.

The Characters are,

The empalement of the flower is composed of five oblong concave leaves, which fall off. The flower has five unequal petals; four of them are nearly equal and roundish, but the fifth is larger, deformed, and indented. It hath ten long, bristly, rising stigmas, terminated by oblong summits, and an arched declining germen, which sits upon the style, and is crowned by an acute stigma. The germen afterward becomes an oblong compressed pod, with several transverse partitions; in each of these is lodged a single flattish seed.

We have but one Species of this genus in the English gardens, viz.

POINCIANA aculeis geminis. *Hort. Upsal.* 101. Flower-fence with double spines.

There are two varieties of this, which were discovered by the late Dr. *Houftoun* in the *Spanish West-Indies*. One of these hath a red, and the other a yellow flower, but as there appears to be no other difference in the plants from the common sort, they must be supposed only accidental variations, which have risen from seeds.

This plant grows naturally in both *Indies*. It is planted in hedges, to divide the lands in *Barbadoes*, from whence it had the title of Flower-fence; it is also called *Spanish Carnations* by some of the inhabitants of the *British* islands. It rises with a stait stalk from ten to fifteen feet high, covered with a smooth gray bark, and is sometimes as thick as the small of a man's leg, dividing into several spreading branches at the top, which are armed at each joint with two short, strong, crooked spines, and are garnished with decompound winged leaves, each leaf being composed of six or eight pair of simple winged leaves, the lower pair being composed of four or five pair of lobes, the others gradually increasing in their number toward the top, where they decrease again, and are smaller. The lobes are of a light green colour, and, when bruised, emit a strong odour.

The branches are terminated by loose spikes of flowers, which are sometimes formed into a kind of pyramid, and at others they are disposed more in form of an umbel. The foot-stalk of each flower is near three inches long; the flower is composed of five petals, which are roundish at the top, but are contracted to narrow tails at their base; they spread open, and are beautifully variegated with a deep red or Orange colour, yellow, and some spots of green; they have a very agreeable odour. In the center of the flower is situated a slender style above three inches long, upon which the germen sits, and is accompanied by ten stamina, nearly of the same length with the style, terminated by oblong summits. After the flower is past, the germen becomes a broad flat pod, about three inches long, divided into three or four cells by transverse partitions, each including one flattish irregular seed. The leaves of this plant are used instead of *Sena* in the *West-Indies* to purge, and from thence the plant is by some persons titled *Sena*.

Ligon says the seeds of this plant were first carried to *Barbadoes* from *Cape Verd Islands*, and the beauty of the flowers was such, that the inhabitants soon spread it over that island, and afterward it was transported into most of the neighbouring islands. This may have been so, but it is very certain that the plant grows naturally in *Jamaica*, where the late *Dr. Houffoun* found it in the woods at a great distance from any settlements. He also found it growing naturally at *La Vera Cruz*, and at *Campeachy*, where he also found the two varieties with red and yellow flowers.

The seeds of this plant are annually brought over in plenty from the *West-Indies*, which, if sown upon a hot-bed, will rise easily. When the plants are come up, they should be transplanted each into a small pot, and plunged into a hot-bed of tanners bark, observing to shade them from the sun, till they have taken root; after which they must have air in proportion to the warmth of the season, and be frequently refreshed with water. When the plants have filled the pots with their roots, they should be shaken out, and placed into larger ones, that they may have room to grow. If care be taken to water and shift them as often as is necessary, they will grow to be three feet high the first season. At *Michaelmas* the pots should be plunged into a fresh hot-bed of tanners bark in the stove, which should be kept to the *Ananas* heat, marked on the botanical thermometers, and frequently refreshed with water, but they should not have too much water in winter. The earth, which these plants should be planted in, must be fresh, light, and sandy (but not over-rich), in which they will stand the winter better than if planted in a stronger soil.

These plants must constantly remain in the bark-stove, where in warm weather they should have a large share of air, but they must not be exposed to cold; if damp seizes their top, it very often kills the plants, or at least occasions the loss of their heads. With proper management they will grow much taller here than they usually do in *Barbadoes*, but their stems will not be larger than a man's finger, which is occasioned by their being drawn up by the glasses of the stove. I have had some of these plants more than eighteen feet high in the *Chelsea* garden, which have produced their beautiful flowers some years. These flowers have always appeared in *December*, but in the *West-Indies* I am informed they flower twice a year, at which times they make a most beautiful appearance.

POKE VIRGINIAN. See *Phytolacca*.

POLEMONIUM. *Tourn. Inst. R. H. 146. tab. 61.* Greek *Valerian*, or *Jacob's Ladder*.

The Characters are,

The flower has a permanent empalement, which is cut into five segments; it has one wheel-shaped petal. The tube is very short; the upper part is divided, and spreads open. It hath five slender stamina, inserted in the valves of the tube, which are shorter than the petal, and are terminated by roundish summits. In the bottom of the tube is situated an acute oval germen, supporting a slender style, equal with the petal, crowned by a revolving trifid stigma. The germen afterward turns to a three-cornered oval capsule, having three cells, filled with irregular acute-pointed seeds.

The Species are,

1. POLEMONIUM *calycibus corollæ tubo longioribus.* *Lin. Sp. Plant. 162.* Greek *Valerian* with an empalement longer than the tube of the flower.

2. POLEMONIUM *foliis pinnatis, radicibus reptatricibus.* *Flor. Virg. 22.* Greek *Valerian* with winged leaves, and a creeping root.

The first sort grows naturally in many parts of *Europe*. It has been discovered growing wild in *Carleton Beck*, and about *Malham Cove* near *Craven*, in *Yorkshire*. Of this there are three varieties, one with a white, another with a blue, and one with a variegated flower, also another with variegated leaves.

This plant has winged leaves, which are composed of several pair of lobes placed alternately. The stalks rise near a foot and a half high; they are hollow, channelled, and are garnished with winged leaves, of the same form with the lower, but decrease upward in their size; they are terminated by bunches of flowers, which sit very close; they have one petal, which has a short tube, cut into five roundish segments at the top; they are of a beautiful blue colour, and have each five stamina, which are terminated by yellow summits. These flowers appear the latter end of *May*, and are succeeded by oval acute-pointed capsules, with three cells, filled with irregular seeds, which ripen in *August*.

These plants are easily propagated by sowing their seeds in the spring upon a bed of light earth, and when they are come up pretty strong, they should be pricked out into another bed, about four or five inches asunder, observing to shade and water them, until they have taken root; after which they will require no farther care, but to keep them clear from weeds until *Michaelmas*, at which time they must be transplanted into the borders of the flower-garden, where, being intermixed with different sorts of flowers, they will make a beautiful appearance.

This plant is not naturally of long duration, but by taking them up in autumn, and parting of them, they may be continued several years, but as the seedling plants always flower much stronger than the offsets, few persons ever propagate them by slips.

The sort with white flowers will frequently arise from the seeds of the blue, as will also that with variegated flowers, but these may be continued by parting of their roots.

The sort with variegated leaves is preserved by parting of their roots, because the plants raised from seeds would be subject to degenerate, and become plain. The best time to part them is about *Michaelmas*, that they may take good root before the cold weather prevents them. These should have a fresh light soil, but if it be too rich, their roots will rot in winter, or the stripes will go off in the summer.

The second sort grows naturally in *Virginia* and other parts of *North America*. This hath creeping roots, by which it multiplies very fast. The leaves have seldom more than three or four pair of lobes, which stand at a much greater distance from each other than those of the common sort; they are of a darker green. The lobes are narrow, and are placed alternately; the stalks rise nine or ten inches high, sending out branches their whole length. The flowers are produced in loose bunches, standing upon pretty long foot-stalks; they are smaller than those of the common sort, and are of a lighter blue colour.

This sort may be propagated by seeds in the same manner as the common sort, or by parting of their roots in autumn, and is equally hardy with the common sort.

POLIANTHES. *Lin. Gen. Plant. 384.* The *Tuberose*.

The Characters are,

The flower has no empalement; it has one funnel-shaped petal. The tube is oblong and incurved; the brim is cut into six oval segments, which spread open. It hath six thick stamina, situated in the chaps of the petal, terminated by linear summits, which are longer than the stamina. In the bottom of the tube is situated a roundish germen, supporting a slender style, crowned by a thick trifid honey-bearing stigma. The germen afterward turns to an obtuse, roundish, three-cornered capsule, having three cells, which are filled with plain half-round seeds, disposed in a double range.

We have but one Species of this genus, viz.

POLIANTHES *floribus alternis.* *Hort. Cliff. 127.* *Polianthes* with flowers placed alternately; commonly called *Tuberose*.

The varieties of this are the *Tuberose*, with a double flower, the striped-leaved *Tuberose*, and the *Tuberose* with

a smaller flower; the last is mentioned by several authors as a distinct species, but is certainly a variety.

This sort is frequent in the south of *France*, from whence the roots have been often brought to *England* early in the spring, before those roots have arrived from *Italy*, which are annually imported; the stalks of this are weaker, and do not rise so high, and the flowers are smaller than those of the common *Tuberose*, but in other respects is the same.

The *Tuberose* grows naturally in *India*, from whence it was first brought to *Europe*, where it now thrives in the the warmer parts, as well as in its native soil. The *Genoese* are the people who cultivate this plant, to furnish all the other countries where the roots cannot be propagated without great trouble and care, and from thence the roots are annually sent to *England*, *Holland*, and *Germany*. In most parts of *Italy*, *Sicily*, and *Spain*, the roots thrive and propagate without care, where they are once planted.

This plant has been long cultivated in the *English* gardens, for the exceeding beauty and fragrancy of its flowers; the roots of this are annually brought from *Genoa*, by the persons who import *Orange trees*; for as these roots are too tender to thrive in the full ground in *England*, so there are few persons who care to take the trouble of nursing up their offsets, till they become blowing roots, because it will be two or three years before they arrive to a proper size for producing flowers; and as they must be protected from the frost in winter, the trouble and expence of covers is greater than the roots are worth, for they are generally sold pretty reasonable, by those who import them from *Italy*.

The double flowering is a variety of the first, which was obtained from seed by *Monf Le Cour*, of *Leyden* in *Holland*, who for many years was so tenacious of parting with any of the roots, even after he had propagated them in such plenty, as to have more than he could plant, caused them to be cut in pieces, that he might have the vanity to boast of being the only person in *Europe* who was possessed of this flower; but of late years the roots have been spread into many parts, and as there is no method to propagate this but by the offsets, most people who have had of this sort, are careful to multiply and increase it, which is done by planting the offsets upon a moderate hot-bed early in *March*, and covering the bed in cold weather with mats or straw; in summer they must have plenty of water in dry weather. In this bed the roots may remain till the leaves decay in autumn, but if there should happen any frost before that time, the bed should be covered to guard the roots from the frost, because if the frost enters so low as to reach the roots, it will kill them; and if the leaves are injured by the frost, it will weaken the roots. Where there is due care taken to screen them from frost, and too much wet, it will be the best way to let the roots remain in the bed till the end of *November*, or the beginning of *December*, provided hard frosts do not set in sooner, for the less time the roots are out of the ground, the stronger they will be, and the sooner they will flower; when the roots are taken up, they should be cleaned from the earth, and laid up in dry sand, where they may be secure from frost and wet; here they should remain until the season for planting them again; this same method should be practised by those who are desirous to cultivate the single sort in *England*, and also that with striped leaves must be propagated the same way.

I shall next give directions for the management of those roots, which are annually brought from *Italy*. And first, in the choice of the roots, those which are the largest and plumpest, if they are perfectly firm and round, are the best, and the fewer offsets they have, the stronger they will flower, but the under part of the roots should be particularly examined, because it is there that they first decay; after the roots are chosen, before they are planted, the offsets should

be taken off; for if these are left upon the roots, they will draw away part of the nourishment from the old root, whereby the flower-stems will be greatly weakened.

As these roots commonly arrive in *England* in the month of *February* or *March*, those who are desirous to have these early in flower, should make a moderate hot-bed soon after the roots arrive, which should have good rich earth laid upon the dung, about seven or eight inches deep; this bed should be covered with a frame, and when the bed is in a proper temperature for warmth, the roots should be planted at about six inches distance from each other every way. The upper part of the root should not be buried more than one inch in the ground; when the roots are planted, there should be but little water given them, until they shoot above ground, for too much wet will rot them, when they are in an inactive state, but afterward they will require plenty of water, especially when the season is warm. When the flower-stems begin to appear, the bed should have a large share of air given to it, otherwise the stalks will draw up weak, and produce but few flowers; for the more air these plants enjoy in good weather, the stronger they will grow, and produce a great number of flowers; therefore, toward the beginning of *May*, the frame may be quite taken off the bed, and hoops fastened over it, to support a covering of mats, which need not be laid over but in the night, or in very cold weather, so that by enjoying the free open air, their stems will be large; and if they are well watered in dry weather, their flowers will be large, and a great number on each stem.

This first planting will require more care than those which are designed to come after them; for in order to have a succession of these flowers, the roots should be planted at three different times, *viz.* the first the beginning of *March*, the second the beginning of *April*, and the third at the end of that month, or the beginning of *May*, but the latter beds will require a much less quantity of dung than the first, especially that bed which is the last made, for if there is but warmth enough to put the roots in motion, it is as much as will be required; and this last bed will need no covering, for many times those roots which are planted in the full ground at this season, will produce strong flowers in autumn; but in order to secure their flowering, it is always the best way to plant them on a gentle hot-bed. As to the second bed, that should be arched over with hoops, and covered with mats every night, and in bad weather, otherwise the late frosts which frequently happen in *May*, will pinch them.

These plants may remain in the beds until the flowers are near expanding, at which time they may be carefully taken up, preserving the earth to their roots, and planted in pots, and then placed in the shade for about a week to recover their removal; after which time the pots may be removed into halls, or other apartments, where they will continue in beauty a long time, and their fragrant odour will perfume the air of the rooms where they are placed, and by having a succession of them, they may be continued from *Midsummer* to the end of *October*, or middle of *November*; but as the stems of these plants advance, there should be some sticks put down by each root, to which the stems should be fastened, to prevent their being broken by the wind.

It is a common practice with many people, to plant these roots in pots, and plunge the pots into a hot-bed; but there is much more trouble in raising them in this method, than in that before directed; for if the roots are not planted in very small pots, there will be a necessity of making the beds much larger, in order to contain a quantity of the roots; and if they are first planted in small pots, they should be shaken out of these into pots of a larger size, when they begin

begin to shoot out their flower-stems, otherwise the stalks will be weak, and produce but few flowers; therefore I prefer the other method, as there is no danger in removing the roots, if it is done with care.

When the roots are strong and properly managed, the stems will rise three or four feet high, and each stem will produce twenty flowers or more; and in this the great beauty of these flowers consists, for when there are but a few flowers upon the stalks, they will soon fade away, and must be frequently renewed; for the flowers are produced in spikes coming out alternately upon the stalk, the lower flowers opening first, and as these decay, those above them open, so that in proportion to the number of flowers upon each stalk, they continue in beauty a longer or shorter time.

The sort with double flowers will require a little more care, in order to have the flowers fair; but this care is chiefly at the time of blowing, for the flowers of this sort will not open, if they are exposed to the open air; therefore when the flowers are fully formed and near opening, the pots should be placed in an airy glass-case, or a shelter of glasses should be prepared for them, that the dews and rains may not fall upon them, for that will cause the flowers to rot away before they open, and the heat of the sun drawn through the glasses, will cause their flowers to expand very fair. With this management, I have had this sort with very double flowers extremely fair, and upward of twenty upon one stem, so that they have made a beautiful appearance; but where this has not been practised, I have rarely seen one of them in any beauty.

POLIUM. *Tourn. Inst. R. H. 206. tab. 97.* Mountain Poley.

The Characters are,

The empalement of the flower is cut into five acute segments. The flower is of the lip kind; it hath one petal, with a short tube. The stamina occupy the place of the upper lip, and the lower lip is cut into five segments. It hath four awl-shaped stamina, which are terminated by small summits, and a germen divided into four parts, supporting a slender style, crowned by two narrow stigmas; the germen afterward become four naked seeds, inclosed in the empalement.

The Species are,

1. POLIUM *foliis lanceolatis integerrimis, caulibus procumbentibus, floribus corymbosis terminalibus.* Mountain Poley with entire spear-shaped leaves, trailing stalks, and flowers growing in a corymbus at the end of the branches.

2. POLIUM *spicis oblongis foliis obtusis crenatis tomentosis.* Mountain Poley with oblong spikes of flowers, and obtuse, crenated, woolly leaves; yellow Mountain Poley.

3. POLIUM *spicis subrotundis, caulibus suffruticosis incanis, foliis linearibus tomentosis.* Mountain Poley with roundish spikes of flowers, hoary shrubby stalks, and very narrow woolly leaves.

4. POLIUM *caule ramoso procumbente, foliis lineari-lanceolatis dentatis, floribus corymbosis terminalibus.* Poley with a branching trailing stalk, narrow, spear-shaped, woolly, indented leaves, and flowers growing in a corymbus, terminating the branches.

5. POLIUM *caule erecto diffuso, foliis lineari-lanceolatis crenatis, corymbis terminalibus lateralibusque.* Poley with an erect diffused stalk, narrow, spear-shaped, crenated leaves, and flowers growing in a corymbus, terminating and proceeding out of the sides of the branches.

6. POLIUM *caulibus procumbentibus hirsutissimis, foliis cuneiformi orbiculatis crenatis.* Poley with very hairy trailing stalks, and orbicular wedge-shaped leaves, which are crenated.

7. POLIUM *caule erecto ramoso, foliis lanceolatis dentatis subtus tomentosis, floribus confertis terminalibus.* Poley with an upright branching stalk, spear-shaped indented leaves, which

are woolly on their under side, and flowers growing in clusters, terminating the branches.

8. POLIUM *caule erecto corymboso, foliis linearibus reflexis, floribus terminalibus.* Poley with an upright stalk, branching out in form of a corymbus, narrow reflexed leaves, and flowers terminating the stalks.

9. POLIUM *caule ramoso, procumbente, foliis lineari-lanceolatis supernè dentatis, spicis oblongis terminalibus.* Poley with a trailing branching stalk, narrow spear-shaped leaves, which are indented toward the top, and oblong spikes of flowers terminating the stalks.

10. POLIUM *caule erecto suffruticoso, foliis linearibus confertis, spicis cylindricis fastigiatis terminalibus.* Poley with an upright under-shrub stalk, narrow leaves growing in clusters, and cylindrical spikes of flowers growing in bunches, which terminate the stalks.

11. POLIUM *caule erecto fruticoso, foliis lanceolatis tomentosis integerrimis, corymbis terminalibus.* Poley with an upright shrubby stalk, spear-shaped woolly leaves, which are entire, and flowers growing in a corymbus, terminating the stalks.

12. POLIUM *caule procumbente, foliis linearibus serratis, corymbis confertis terminalibus.* Poley with a trailing stalk, narrow sawed leaves, and clustered flowers growing in a corymbus, at the ends of the stalks.

13. POLIUM *caule diffuso procumbente, foliis linearibus dentatis tomentosis, spicis subrotundis.* Poley with a trailing diffused stalk, narrow indented woolly leaves, and roundish spikes of flowers.

14. POLIUM *caule erecto suffruticoso, foliis lanceolatis integerrimis, corymbis confertis terminalibus.* Poley with an erect shrubby stalk, spear-shaped entire leaves, and clustered flowers growing in a corymbus at the ends of the branches.

15. POLIUM *caule diffuso, foliis linearibus pinnato-dentatis, spicis subrotundis lateralibus.* Poley with a diffused stalk, linear, winged, indented leaves, and roundish spikes of flowers proceeding from the sides of the stalks.

The first sort grows naturally on the mountains about *Basil* and *Geneva*, as also in *France*. The root of this plant is composed of many ligneous fibres, from which arise several weak, trailing, ligneous stalks, eight or nine inches long, sending out many weak branches, garnished with small spear-shaped leaves, of a deep green, and entire, placed by pairs. The flowers are produced in a corymbus at the end of the branches; they are white, and shaped like those of the other species. These appear in *June* and *July*, but are seldom succeeded by seeds in *England*.

The second sort grows naturally in *Spain*. The stalks of this are rather herbaceous, and trail upon the ground; they are about six inches long, hoary, and garnished with woolly leaves; some of them are wedge-shaped, others are oblong, ending in obtuse points, and are crenated toward their ends. The flowers are collected in oblong thick spikes at the end of the branches; they are of a deep yellow colour, and appear the beginning of *June*, but are seldom succeeded by seeds in this country.

The third sort grows naturally in *Spain* and *Portugal*. The stalks of this are ligneous, erect, and branching, covered with a hoary down; they rise six or eight inches high, garnished with linear woolly leaves about half an inch long, having sometimes two or three slight indentures on their edges. The flowers are collected in roundish spikes at the end of the branches; they are of a bright yellow, and have woolly empalements. These appear in *June* and *July*.

The fourth sort grows naturally in the south of *France*, and in *Italy*. This hath a trailing branching stalk, which at the bottom is ligneous, but the branches are herbaceous and woolly; they are garnished with linear, spear-shaped, woolly leaves, indented on their edges. The flowers are produced in a corymbus at the end of the branches, which

are small, white, and shaped like those of the other species. This flowers in *June* and *July*.

The fifth sort grows naturally near the sea, in the south of *France* and in *Italy*. This hath an erect branching stalk, which rises a foot high; the lower part becomes ligneous, but the upper is herbaceous; the leaves are linear, spear-shaped, and crenated on their edges, of a pretty thick consistence, and a little woolly. The flowers are collected in a corymbus at the end of the branches; they are white, and like those of the other species. This flowers in *July* and *August*.

The sixth sort grows naturally on the *Pyrenean* mountains. This hath slender shrubby stalks, which trail close upon the ground, and put out roots; the leaves are round at the top, but at their base are contracted in form of a wedge, and are crenated on their edges, so as to resemble at first sight the leaves of *Ground-ivy*; but they are hairy, and of a thicker consistence. The flowers are collected in round bunches at the end of the branches; one half of their petals are purple, and the other half white; they are larger than those of the other species, but are of the same form. It flowers great part of summer, but seldom produces seeds here.

The seventh sort grows naturally in *Italy* and *Spain*. This hath a ligneous, erect, branching stalk, which rises near a foot high; it is very hoary, and branches out toward the top; the leaves are spear-shaped, indented on their edges, and woolly on their under side. The flowers are white, small, and grow in clusters at the end of the branches. It flowers in *June* and *July*.

The eighth sort grows naturally in *Spain* and *Italy*. This rises with a shrubby stalk nine or ten inches high, branching out toward the top in form of a corymbus; the leaves are linear, and their edges are reflexed. The flowers are collected in roundish woolly heads at the end of the branches; they are white, and smaller than most of the other species. This flowers in *June* and *July*.

The ninth sort grows naturally in *Spain*. It hath a trailing branching stalk about six or eight inches long, which is ligneous at bottom, but upward is herbaceous and hoary; the leaves are linear, spear-shaped, and indented toward the ends. The flowers are collected in oblong spikes at the end of the branches; they are of a pale yellow colour, and shaped like those of the other species. This flowers great part of summer.

The tenth sort grows naturally in *Sicily*. This hath slender shrubby stalks, which rise a foot and a half high; they are smooth and white, sending out a few short branches toward the top, garnished with small linear leaves growing in clusters. The flowers are collected in long cylindrical spikes, which stand in bunches at the top of the stalks, and sometimes come out on the sides; these are small and white. It flowers in *July* and *August*.

The eleventh sort grows naturally in *Valencia*. This hath slender, ligneous, hoary stalks near two feet high, garnished with small, spear-shaped, entire, woolly leaves at intervals, standing in clusters, and sit close to the stalk; the upper part of the stalk divides into several slender foot-stalks, each sustaining a small corymbus of white flowers. The whole plant has a strong aromack odour. It flowers late in summer.

The twelfth sort grows naturally in the south of *France* and in *Italy*. This hath trailing ligneous stalks about a foot long, garnished with linear, sawed, hoary leaves. The flowers are collected in a corymbus at the end of the branches; they are small and white. This flowers in *June* and *July*.

The thirteenth sort grows naturally in *Spain* and *Italy*. This hath diffused trailing stalks, which are very woolly,

garnished with narrow indented leaves, which are covered with a woolly down, and are terminated by roundish heads of flowers, which are yellow; the whole plant is very hoary. It flowers in *July*.

The fourteenth sort grows naturally in *Spain*. This hath erect branching stalks about six or eight inches high; the branches come out opposite the whole length of the stalk; they are garnished with small spear-shaped leaves, of a dark green colour on their upper side, but hoary on their under; the stalks and branches are terminated by clusters of blue flowers, which are collected in roundish heads. This sort flowers in *July* and *August*.

The fifteenth sort grows naturally about *Smyrna*. This hath diffused white stalks, which rise about a foot high, closely garnished with linear leaves, indented regularly on their edges like those of *Spleenwort*, but the indentures are not deep; they are of a dark green on their upper side, but hoary on their under. The flowers are collected in roundish spikes, which terminate the branches, and also come out from their side; they are white, and shaped like those of the other species. It flowers in *July* and *August*.

There are several other species of this genus, which grow naturally in the warmer parts of *Europe*; but those which are here mentioned, are all that I have yet seen growing in the *English* gardens, therefore I have omitted the other, as I have had no opportunity to examine them myself.

All the sorts, except the first, are abiding plants; they may be propagated by seeds. These should be sown upon a bed of fresh light earth in the spring, and when the plants come up, they must be carefully kept clean from weeds; about the middle of *July* the plants will be fit to remove, when they may be carefully taken up, and part of them planted on a warm border of dry rubbishy soil, observing to shade them from the sun, and water them till they have taken new root; after which they will require no other culture, but to keep them clean from weeds. My advising these, and many other aromack plants, which are natives of the warmer parts of *Europe*, to be planted in rubbish, is founded upon long experience of their abiding much longer, and resisting the cold of our winters much better than when they are growing in better ground, where they grow much freer, are fuller of moisture, and therefore more liable to be killed by frost.

The other part of the plants may be planted in small pots, filled with fresh, light, undunged earth, and placed in the shade till they have taken new root; then they may be removed into an open situation, where they may remain till the beginning of *November*, when they should be placed under a common frame, to secure them from the frost in winter, which sometimes destroys these plants in the open air; by this method the species may be preserved.

These plants may be disposed in a garden, so as to afford pleasure, by mixing them with *Marum*, *Mastich*, and several other aromack plants, upon the sloping sides of banks, which are exposed to the sun, or upon little hillocks raised in a sheltered situation, where, by the diversity of their hoary branches, being of various shapes, they will make a pretty appearance, and in such places they will resist the cold much better than when they are planted in a good soil.

They may also be propagated by cuttings or slips, which should be planted the beginning of *April*, just before they shoot, upon a border exposed to the east; and if the season proves dry, they must be watered and shaded until they have taken root; afterward they will require no other care but to keep them clean from weeds, and at *Michaelmas* the plants should be removed where they are designed to remain; but it will be proper to put a plant of each sort in pots, that they may be sheltered in winter, to preserve the kinds.

The fourth and fifth sorts are sometimes used in medicine.
POLYANTHOS. See Primula.

POLYGALA. Tourn. Inst. R. H. 174. tab. 79. Milk-wort.

The Characters are,

The flower has a small permanent-empalement. The flower is shaped like those of the butterfly kind; the number of petals is indeterminate. The wings are large, plain, and extend beyond the other petals; the standard is tubulous, short, and reflexed at the brim, where it is bifid. The keel is concave, compressed, and bellied toward the top. It hath eight stamina in two bodies, included in the keel, terminated by single summits, and an oblong germen, supporting an erect style, terminated by a thick bifid stigma. The germen after-ward becomes a heart-shaped capsule, having two cells, each containing one seed.

The Species are,

1. POLYGALA floribus cristatis racemosis, caulibus herbaceis simplicibus procumbentibus, foliis linearilanceolatis. Amœn. Acad. 2. p. 136. Milkwort with branching crested flowers, single, trailing, herbaceous stalks, and linear spear-shaped leaves; common Milkwort.

2. POLYGALA floribus cristatis racemosis, caule erecto, foliis lanceolato linearibus acutis. Sauv. Monsp. 53. Milkwort with branching crested flowers, an erect stalk, and acute, spear-shaped, linear leaves.

3. POLYGALA floribus cristatis, carinâ lunulatâ, caule fruticoso, foliis lævibus oblongis obtusis. Amœn. Acad. 2. p. 138. Milkwort with crested flowers, a moon-shaped keel, and a shrubby stalk bearing oblong leaves, which end in obtuse points.

4. POLYGALA floribus imberbibus sparsis, carinæ apice subrotundo, caule fruticoso, foliis lanceolatis. Amœn. Acad. 2. p. 140. Milkwort with flowers growing thinly and without beards, the point of the keel roundish, a shrubby stalk, and spear-shaped leaves.

5. POLYGALA floribus imberbibus spicatis, caule erecto herbaceo simplicissimo, foliis lato-lanceolatis. Amœn. Acad. 2. p. 139. Milkwort with spiked flowers, having no beards, an erect, single, herbaceous stalk, and broad spear-shaped leaves; commonly called Seneka Rattle Snakewort.

6. POLYGALA floribus imberbibus, oblongo-capitatis, caule erecto ramoso, foliis linearibus. Milkwort with beardless flowers growing in oblong heads, an erect branching stalk, and linear leaves.

7. POLYGALA floribus cristatis, racemo terminali, caule erecto ramoso, foliis lanceolatis tomentosis. Milkwort with crested flowers, an erect branching stalk, terminated by a loose spike of flowers, and woolly spear-shaped leaves.

There are several other species of this genus, some of which grow naturally in Europe, and others in America, but as they are seldom cultivated in gardens, so it would be to little purpose to enumerate them here.

The first sort grows naturally in pastures and upon heaths in many parts of England. Of this there are three varieties, one with a blue, another with a purple, and a third with white flowers, which are frequently found intermixed; and there is another which is larger, and supposed to be a distinct species; but I rather believe this difference is owing to the soil in which they grow, for the large one is generally found growing in moist pastures, and the small one upon dry heaths. This hath a perennial root, from which come out three or four slender, trailing, herbaceous stalks, garnished with linear spear-shaped leaves. The flowers are produced at the top of the stalks, branching out; they are small, and of a blue, purple, or white colour, having two wings, a keel and standard like the butterfly flowers. These appear in June, and are succeeded by flattish heart-shaped capsules, divided into two cells, each containing one seed.

The second sort grows naturally upon sterile ground about Montpelier. This sort is annual; it rises with an herbaceous stalk about six inches high, garnished with narrow leaves, placed opposite, ending in acute points. The flowers are small, of a worn-out purple colour; the keel is bearded like the common sort. This flowers in July, and has seed-vessels like the first sort, but smaller; the seeds ripen in autumn.

These sorts are very rarely admitted into gardens, nor do they thrive so well when sown or transplanted there, as in their natural situation. If these are cultivated, their seeds should be sown soon after they are ripe, otherwise they rarely grow.

The third sort grows naturally at the Cape of Good Hope. This hath a shrubby stalk, covered with a smooth brown bark, which rises five or six feet high, sending out several spreading branches toward the top, closely garnished with oblong, blunt-pointed, smooth leaves, of a lucid green, sitting close to the branches. The flowers are produced at the end of the branches; they are large, white on their outside, but of a bright purple within; the keel of the flower is hollowed like a half-moon, and is bearded; the wings are expanded wide, and the standard is incurved; this plant continueth flowering most part of summer. The flowers are succeeded by compressed heart-shaped seed-vessels, having two cells, each containing one hard, smooth, shining seed. This plant is propagated by seeds, which should be sown in small pots filled with light loamy earth soon after they are ripe. These pots may be placed where they may have the morning sun only till October, when they should be placed under a hot bed frame, and plunged into old tanners bark, which has lost its heat, where they may be defended from frost during the winter, and in the spring the pots should be plunged into a moderate hot-bed, which will bring up the plants. When these appear, they should not be too tenderly treated, but must have a large share of free air admitted to them; and when they are fit to transplant, they should be carefully shaken out of the pots, and separated, planting each into a small pot, filled with soft loamy earth, and plunged into a very moderate hot-bed, to forward their taking new root, observing to shade them from the sun, and gently refresh them with water, but they must not have too much wet. When they are rooted, they must be gradually inured to bear the open air; in June they may be placed abroad in a sheltered situation, where they may remain till the middle or latter end of October, according as the season proves favourable; then they must be removed into the green-house, and treated in the same way as Orange trees, being careful not to give them too much wet during the winter season. In the summer they must be placed abroad with other green-house plants, where, by their long continuance in flower, they will make a fine appearance. The management of this plant is nearly the same as for the Orange-tree.

The fourth sort grows naturally on the Alps, and also upon the mountains in Austria and Hungary. This rises with a slender, branching, ligneous stalk about a foot high, when it grows upon good ground, but on a rocky soil, seldom more than half that height. The branches are closely garnished with stiff, smooth, spear-shaped leaves, of a lucid green. From between the leaves, toward the top of the branches, the flowers come out upon very short foot-stalks; they are white on their outside, but within are of a purplish colour mixed with yellow, and have a grateful odour. These appear in May, and are succeeded by seed-vessels, shaped like those of the former sort.

This plant is very difficult to cultivate in gardens, for it commonly grows out of the fissures of rocks, so cannot be easily transplanted, and the seeds are with difficulty obtained from

from abroad; nor do these vegetate till they have been a whole year in the ground; and when the plants come up, they make very little progress here, and are as difficult to transplant as almost any plant at present known, which occasions its present scarcity in *England*.

The best method of cultivating this is by seeds, which should be procured as fresh as possible from the places of its natural growth, and sown in pots as soon as it arrives; these pots may be plunged into the ground, where they may have only the morning sun. If these are sown before *Christmas*, there will be a chance of the plants coming up the following spring, but those, which are not sown till toward spring, will remain in the ground a year; therefore the pots should be plunged into the ground, where they may have but little sun the following summer, and in autumn they may be removed, and plunged into an old tan-bed under a hot-bed frame, where they may be protected from severe frost; for although this plant is a native of the *Alps* and other cold mountains, yet as the seeds will not be covered with snow here, as they are in their native situation; they are frequently spoiled by the inconstancy of the weather in *England*. When the plants come up, they should be placed in shade during summer, and in autumn they may be turned out of the pots, and planted in a border, where they may have only the morning sun, for this plant will not thrive long in pots. If the winter proves very severe, it will be proper to cover the surface of the ground about their roots with mulch to keep out the frost. If the plants take root in the border, they should remain there undisturbed, and be only kept clean from weeds, for the ground about their roots should not be dug or dunged.

The fifth sort grows naturally in most parts of *North America*. This hath a perennial root, composed of several fleshy fibres, from which arise three or four branching stalks, which grow erect, garnished with spear-shaped leaves, placed alternately. The flowers are produced in loose spikes at the end of the branches; they are small, white, and shaped like those of the common sort, but their keels have no beards. It flowers here in *July*, but the plants do not produce seeds.

The root of this sort hath been long used by the *Seneca Indians*, to cure the bite of the Rattle-snake, which, if taken in time, is an infallible remedy. And of late years it hath been used by the inhabitants of *Virginia* in many disorders, which are occasioned by a thick fizy blood; so that the root of this plant, when its virtues are fully known, may become one of the most useful medicines yet discovered. The *Seneca Indians* use this root, which they powder, and generally carry about them when they travel in the woods, lest they should be bit by the Rattle-snake; and whenever this happens, they take a quantity of the powder inwardly, and apply some of it to the part bitten, which is a sure remedy.

The sixth sort grows naturally in *Maryland*. This hath a perennial root, from which arise two or three stalks about eight inches high, which divide into several erect branches, garnished with small linear leaves, of a dark green colour. The flowers are collected into oblong heads at the end of the stalks; they are small, and of a purplish blue colour.

Both these sorts are difficult to obtain, for the seeds rarely succeed, so the best way is to procure their roots from *America*; and when they arrive, plant them in a bed of light earth, in a sheltered situation. In summer they must be kept clean from weeds, and if the surface of the ground about their roots is covered with old tanners bark, or any other kind of mulch in winter, to keep out the frost, it will be a secure method to preserve them.

The seventh sort was discovered by the late Dr. *Houssoun* growing naturally at *La Vera Cruz*. This hath a taper pe-

rennial root, which runs deep in the ground, from which arise several slender branching stalks about six or seven inches high, garnished with downy spear-shaped leaves. The flowers are produced in loose spikes at the end of the branches; they are larger than those of the common sort, and are of a bluish purple colour. The keel of the flower is bearded, as in the common sort.

This is too tender to live in the open air in *England*, and it is one of those plants which will not thrive in pots, so it is difficult to preserve here. It is propagated by seeds. The seeds, which I received from Dr. *Houssoun*, remained a year in the ground before the plants appeared, and the plants lived one year; but when their roots reached the bottom of the pots, they decayed, and those, which were transplanted into larger pots, did not survive their removal, though it was performed with great care.

POLYGONATUM. See *Convallaria*.

POLYPODIUM. *Tourn. Inst. R. H. 540. tab. 316.* Polypody.

The Characters are,

This is one of the Fern tribe, which is distinguished from the others, by the fructification being in roundish spots, distributed on the under surface of the leaf.

The Species are,

1. POLYPODIUM *frondibus pinnatifidis, pinnis oblongis subserratis obtusis, radice squamata. Lin. Sp. Plant. 1085.* Polypody with wing-pointed leaves, having oblong obtuse lobes, which are somewhat sawed, and a scaly root; common Polypody.

2. POLYPODIUM *frondibus pinnatifidis, pinnis lanceolatis lacero-pinnatifidis serratis. Lin. Sp. Plant. 1086.* Polypody with wing pointed leaves, whose lobes are spear-shaped, and the jags wing-pointed and sawed; *Wells* Polypody with jagged leaves.

There are several other species of this plant, which are natives of *America*, some of which are preserved in curious botannick gardens for variety; but as they are rarely cultivated in other gardens, it is not worth while to enumerate them in this place.

The first sort is that which is used in medicine, and is found growing upon old walls and shady banks in divers parts of *England*. The second sort was brought from *Wales*, where it grows in great plenty, and is the most beautiful of all the sorts. These plants may be propagated by parting of their roots in the spring before they shoot, and should be planted in a very poor moist soil under the shade of a wall, for if they are exposed to the sun, they will not thrive. They chiefly delight to grow out of the joints of walls and old buildings, but are commonly found exposed to the north.

POMGRANATE. See *Psidium*.

POMUM ADAMI. See *Aurantium*.

PONTERERIA. *Lin. Gen. Plant. 361.*

The Characters are,

The flowers are included in an oblong sheath, which opens on one side; it hath six petals, which are divided; the three upper are erect, and form a kind of lip; the three under are reflexed. It hath six stamina, which are inserted to the petals; the three, which are longest, are fastened to the mouth of the tube; the other are inserted in the base; they are terminated by prostrate summits. Under the petals is situated an oblong germen, supporting a single style, which declines, and is crowned by a single stigma. The germen afterward turns to a soft fruit, divided into six cells, each containing several small roundish seeds.

The Species are,

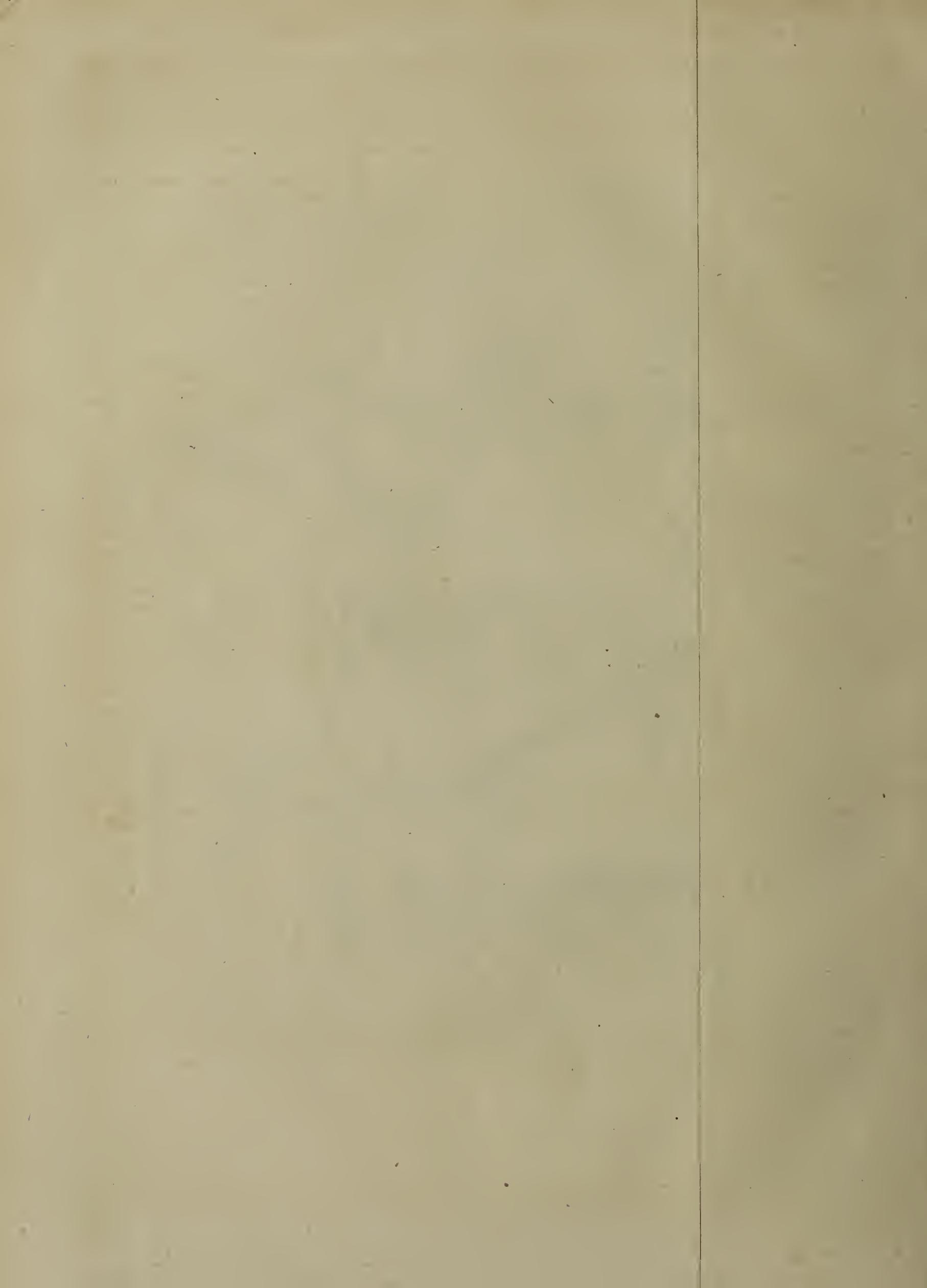
1. PONTERERIA *foliis hastato-cordatis, floribus spicatis.* Pontederia with spear-pointed heart-shaped leaves, and spiked flowers.

POIXGALIA, Virginiana foliis oblongis floribus in thyrsis candidis radice Alcyoniformi

Yuccagan, Rattle, Snake Root



W. Wood sculp.



2. *PONTEDERIA foliis hastatis, floribus umbellatis. Lin. Sp. Plant.* 288. Pontederia with spear-pointed leaves, and flowers growing in umbels.

The first sort grows naturally in marshy places in *Virginia*, and most parts of *North America*, and the late Dr. *Houssoun* found it growing plentifully at *La Vera Cruz*. This hath a perennial root, from which arise two or three herbaceous thick stalks a foot high, each having one arrow-pointed heart-shaped leaf, of a pretty thick consistence. The base is deeply indented, and the two ears are rounded; the foot-stalk of the leaf closely embraces the stalk like a spatha or sheath for near three inches in length; above this is another sheath, which incloses the spike of flowers; this opens on one side, and the stalk rises near two inches above it, where the spike of flowers begin. The spikes are about three inches long; the flowers are blue, sit very close together, and have the appearance of lip flowers. These appear in *June*, but are not succeeded by seeds in *England*.

As this plant grows naturally on moist boggy places, it is very difficult to be preserved in *England*; nor does the plant arise from seeds here, for I have sowed the seeds in various situations, and managed them different, but could never get up any of the plants; but I had three or four of the plants sent me, inclosed in large clods of earth from *New England*, which I planted in pots, covering them with moss, and constantly supplied them with water. With this management two of them flowered, but the following winter destroyed them, as they were not put under shelter; so that to preserve them, they should be placed under a hot-bed frame in winter, where they may be exposed to the open air at all times, when the weather is mild.

The second sort grows naturally about *Madras* in watery places. This rises with a single stalk eight or nine inches high, having one arrow-pointed leaf, whose base embraces the stalk like a sheath, and from the open side of the sheath comes out the flowers, which are at first inclosed in another smaller sheath; these grow in a small kind of umbel; they are composed of six acute-pointed petals, which spread open. Each flower stands upon a slender foot-stalk about an inch long; the foot-stalk of the leaf rises a considerable height above the flowers, so that they appear to come out from the middle of the stalk.

This sort is much more difficult to preserve in *England*, because it grows naturally in a hot country, and always in places flowed with water. There was formerly one of these plants brought over to *Charles Duboise, Esq;* at *Mitcham*, but it was not long lived here.

POPULAGO. See *Caltha*.

POPULUS. *Tourn. Inst. R. H.* 592. tab. 365. The Poplar tree.

The Characters are,

The male and female flowers grow upon separate trees. The male flowers or katkins have one oblong, loose, cylindrical empalement, which is imbricated. Under each scale is situated a single flower, without any petal, having a nectarium of one leaf, turbinated at the bottom, and tubulous at the top, and eight stamina terminated by large four-cornered junmits. The female flowers are in katkins like the male, but have no stamina; they have an oval acute-pointed germen, with scarce any style, crowned by a four pointed stigma. The germen afterward becomes an oval capsule, with two cells, including many oval seeds, having hairy down.

The Species are,

1. *POPULUS foliis lobatis dentatis subtus tomentosus.* Poplar-tree with lobated indented leaves, which are downy on their under side; commonly called the *Abele-tree*.

2. *POPULUS foliis subrotundis, dentato-angulatis subtus tomentosus. Hort. Cliff.* 460. Poplar-tree with roundish leaves, which are angularly indented, and downy on their under side; or white Poplar.

3. *POPULUS foliis ovato-cordatis acuminatis erenatis.* Poplar-tree with oval heart-shaped leaves, ending in acute points, which are crenated; the black Poplar.

4. *POPULUS foliis subrotundis dentato angulatis utrinque glabris. Hort. Cliff.* 460. Poplar-tree with roundish leaves, having angular indentures, and smooth on both sides; the *Aspen-tree*.

5. *POPULUS foliis cordatis obsoletè crenatis, utrinque glabris.* Poplar-tree with heart-shaped leaves, which are somewhat crenated, and smooth on both sides.

6. *POPULUS foliis subcordatis oblongis crenatis. Hort. Cliff.* 460. Poplar-tree with oblong leaves, which are crenated, and almost heart-shaped; the *Carolina Poplar-tree*.

7. *POPULUS foliis subcordatis, infernè incanis, supernè atroviridis.* Poplar with leaves which are almost heart-shaped, hoary on their under side, and of a dark green above, commonly called *Tacamahacca*.

The first sort grows naturally in the temperate parts of *Europe*. This and the second sort are frequently confounded together, but they are certainly different species; this is commonly called *Abele-tree* here, and the second white Poplar. The leaves of the first are large, and divided into three, four, or five lobes, which are indented on their edges, of a very dark colour on their upper side, but very white and downy on their under, standing upon foot-stalks, which are about an inch long. The young branches of this tree have a purple bark, and are covered with a white down, but the bark of the stem and older branches is gray. In the beginning of *April* the male flowers or katkins appear, which are cylindrical, scaly, and about three inches long; about a week after come out the female flowers on katkins, which have no stamina like those of the male. Soon after these come out, the male katkins fall off, and in five or six weeks after the female flowers will have ripe seeds inclosed in a hairy covering; then the katkins will drop, and the seeds will be wafted by the winds to a great distance.

The leaves of the second sort are rounder, and not much above half the size of those of the first; they are indented on their edges into angles, and are downy on their under side, but not so white as those of the former, nor are their upper surfaces of so deep green. The shoots of this are paler, the katkins are longer, and the down of the seeds is whiter and longer.

The leaves of the third sort are oval, heart-shaped, and slightly crenated on their edges; they are smooth on both sides, and of a light green colour. The katkins of this are shorter than those of the two former.

The leaves of the fourth sort are roundish, angularly indented; they are smooth on both sides, and stand upon long slender foot-stalks, so are shaken by the least wind, from whence it was titled the trembling Poplar or *Aspen-tree*. The katkins of this are much like those of the first sort, but the young shoots are of a dark brown colour.

The fifth sort I saw growing in the private garden of Dr. *Boerhaave* near *Leyden*; this the doctor told me he received from *Prussia*. The leaves of this are heart-shaped; they are six or seven inches long, and four broad, and are slightly indented on their edges, standing upon very short foot-stalks. The shoots of this tree were very strong, and the tree seemed as if it would grow to a great size, but it was young when I saw it.

The sixth sort grows naturally in *Carolina*, where it becomes a large tree. The shoots of this sort are very strong in *England*, and are generally angular; they have a light green bark, like some sorts of the *Willow*. The leaves upon young trees, and also those upon the lower shoots, are very large, almost heart-shaped and crenated, but those upon the older trees are smaller; as the trees advance, their bark becomes lighter, approaching to a grayish colour.

The

The katkins of this sort are like those of the black Poplar, and the summits of the stamina are purple.

The shoots of this tree, while young, are frequently killed down a considerable length by the frost in winter, but as the trees grow older, their shoots are not so vigorous, and become more ligneous, so are not liable to the same disaster; but the trees should be planted in a sheltered situation, for as their leaves are very large, the wind has great power over them, and the branches being tender, they are frequently broken or split down by the winds in the summer season, where they are much exposed.

The seventh sort grows naturally in *Canada*, and in other parts of *North America*. This seems to be a tree of middling growth, and does not spire upward, but sends out many short thick shoots on every side, which are covered with a light brown bark, garnished with leaves, differing from each other in shape and size, most of them almost heart-shaped, but some are oval, and others near to spear-shaped; they are whitish on their under side, but of a dark green on their upper. The katkins are like those of the black Poplar, but the number of stamina in the male flowers is uncertain from eighteen to twenty-two. The hermaphrodite flowers come out a month later than the male.

These trees may be propagated either by layers or cuttings, which will readily take root, as also from suckers, which the white Poplars send up from their roots in great plenty. The best time for transplanting these suckers is in *October*, when their leaves begin to decay. These may be placed in a nursery for two or three years to get strength, before they are planted out where they are designed to remain; but if they are propagated from cuttings, it is better to defer the doing of that until *February*, at which time truncheons of two or three feet long should be thrust about a foot and a half into the ground. These will readily take root, and if the soil be moist in which they are planted, will arrive to a considerable bulk in a few years.

The black Poplar is not so apt to take root from large truncheons, therefore it is the better method to plant cuttings about a foot and a half in length, thrusting them a foot deep into the ground; these will take root very freely, and may be afterward transplanted where they are to remain. This sort will grow upon almost any soil, but will thrive best in moist places.

The white sorts, as also the Aspen-tree, likewise cause a great litter in the spring, when their katkins and down fall off; and their roots being very apt to produce a large quantity of suckers, but especially those trees that came from suckers, which render them unfit to be planted near a house or garden; but when they are interspersed with other trees in large plantations, they afford an agreeable variety, their leaves being very white on their under sides, which, when blown with the wind, are turned to light.

A considerable advantage may be made by planting these trees upon moist boggy soils, where few other trees will thrive. Many such places there are in *England*, which do not at present bring in much money to their owners; whereas, if they were planted with these trees, they would, in a very few years, over-purchase the ground, clear of all expence; but there are many persons, who think nothing, except Corn, worth cultivating in *England*; or if they plant timber, it must be Oak, Ash, or Elm; and if their land be not proper for either of these, it is deemed little worth; whereas, if the nature of the soil was examined, and proper sorts of plants adapted to it, there might be very great advantage made of several large tracts of land, which at this time lie neglected.

The wood of these trees, especially of the Abele, is very good to lay for floors, where it will last many years, and for its exceeding whiteness, is by many persons preferred to

Oak; but being of a soft contexture, is very subject to take the impression of nails, &c. which renders it less proper for this purpose: it is also very proper for wainscoting of rooms, being less subject to swell or shrink, than most other sorts of wood; but for turnery-ware, there is no wood equal to this for its exceeding whiteness, so that trays, bowls, and many other utensils, are made of it; and the bellows-makers prefer it for their use, as do also the shoemakers, not only for heels, but also for the soles of shoes; it is also very good to make light carts, and the poles are very proper to support Vines, Hops, &c. and the lopping will afford good fuel, which in many countries is much wanted.

The *Carolina Poplar* may also be propagated by cuttings or layers; the latter is generally practised by the nursery-gardeners, being the surest method; and these plants are not so full of moisture as those raised by cuttings, so are less liable to be cut down by the frost when young. There has been no trials made here of the wood of this tree, so I cannot give any account of its worth.

The *Tacamahacca* sends up a great number of suckers from the roots, by which it multiplies in plenty, and every cutting which is planted will take root; so that when a plant is once obtained, there may soon be plenty of the plants raised. The buds of this tree are covered with a glutinous resin, which smells very strong, which is the *Tacamahacca* used in the shops.

PORRUM. *Tourn. Inst. R. H. 382. tab. 204. Leek.*

The Characters are,

The flower hath six bell-shaped petals, collected into a spherical head, covered by a common roundish spathe or sheath, which withers. They have six stamina; three of these are alternately broader than the other, and have forked summits in their middle. They have a short, round, three-cornered germen, supporting a single style, crowned by an acute stigma. The germen afterward becomes a short broad capsule with three lobes, having three cells, filled with angular seeds.

The Species are,

1. PORRUM radice oblongâ tunicatâ, caule planifolio, floribus capitatis, staminibus tricuspидatis. Leek with an oblong coated root, a plain leaf on the stalk, flowers collected in heads, and three-pointed stamina; commonly called *London Leek*.

2. PORRUM caule planifolio umbellifero, umbellâ globosâ, staminibus corollâ longioribus. Leek with a plain leaf on the stalk, which supports a globular umbel of flowers, whose stamina are longer than the petals.

The first sort is commonly cultivated in the *English* gardens. Of this there has been generally supposed two sorts, but I have made trial of them both, by sowing their seeds several times, and find they are the same; the difference which has risen between them, has been occasioned by some persons having saved the seeds from old roots, and not from the seedling Leeks, whereby they have degenerated them, and rendered them smaller and narrower leaved, but by care this may be recovered again, as I have experienced.

The other sort grows naturally in *Siberia*. This hath narrower leaves than the common sort; the stalks are smaller, and do not rise near so high; the heads of flowers are also smaller, and of a purplish colour; the stamina stand out beyond the flower.

Leeks are cultivated by sowing their seeds in the spring, in the same manner as was directed for Onions, with which these are commonly sown, the two sorts of seeds being mixed according to the proportion which is desired of either sort, though the most common method is, to mix an equal quantity of both, for the Onions will greatly out-grow the Leeks in the spring; but these being drawn off in *July*, the Leeks will have time to grow large afterwards, so that there may be a moderate crop of both sorts. The manage-

management of Leeks being exactly the same with Onions, I shall not repeat it in this place, but shall only add, that many persons do sow their Leeks in beds in the spring; and in June, after some of their early crops are taken off, they dig up the ground, and plant their Leeks out thereon, in rows a foot apart, and six inches asunder in the rows, observing to water them until they have taken root; after which they will require no further culture, but to clear the ground from weeds. The Leeks thus planted will grow to a great size, provided the ground be good, and this method is very proper for such persons who have little room.

If you would save the seeds of this plant, you should make choice of some of the largest and best you have, which must remain in the place where they grow until February, when they should be transplanted in a row against a warm hedge, pale, or wall, at about eight inches asunder; and when their stems advance, they should be supported by a string, to prevent their being broken down, to which they are very liable, especially when in head, and the closer they are drawn to the fence in autumn, the better the seeds will ripen; for it sometimes happens in cold summers or autumns, that those which grow in the open garden, do not perfect their seeds in this country, especially if there should be sharp frosts early in autumn, which will entirely spoil the seed.

When it is ripe (which may be known by the heads changing brown) you should cut off their heads with about a foot or more of the stalk to each, and tie them in bundles, three or four heads in each, and hang them up in a dry place, where they may remain till Christmas or after, when you may thresh out the seeds for use. The husk of these seeds is very tough, which renders it very difficult to get out the seeds; therefore some persons, who have but a small quantity, rub it hard against a rough tile, which will break the husks, and get the seeds out better than most other methods I have known used.

PORTULACA. *Tourn. Inst. R. H. 236. tab. 118.* Purslane.

The Characters are;

The empalement of the flower is small, bifid, and permanent, sitting upon the germen. The flower has five plain, erect, obtuse petals, and many hair-like stamina, about half the length of the petals, terminated by single summits, and a roundish germen. Supporting a short style, crowned by five oblong stigmas. The germen afterward becomes an oval capsule with one cell, containing many small seeds.

The Species are,

1. PORTULACA foliis cuneiformibus, floribus sessilibus. *Prod. Leyd. 473.* Purslane with wedge-shaped leaves, and flowers growing close to the stalks; broad-leaved, or garden Purslane.
2. PORTULACA foliis subulatis alternis, axillis pilosis, floribus sessilibus. *Lin. Sp. Plant. 445.* Purslane with awl-shaped leaves placed alternately, hairy joints, and flowers sitting close to the stalks.
3. PORTULACA foliis ovatis gibbis, pedunculo multifloro, caule fruticoso. *Lin. Sp. Plant. 445.* Purslane with oval gibbous leaves, foot-stalks having many flowers, and a shrubby stalk.

The first sort grows naturally in America, and most of the hot parts of the globe. This is the common Purslane which is cultivated in the gardens, and is so generally known as to need no description. There are two varieties of this, one with deep green leaves, and the other hath yellow leaves, which is called Golden Purslane; but as both these arise from the same seeds, so they are only seminal variations. There is also a third variety, with smaller and less succulent leaves, which is called Wild Purslane, because where-ever it is once sown in a garden, and the plants permitted to scatter their seeds, the plants will come up as

weeds the following year; but this I am sure is a degeneracy from the Garden Purslane, for I have sown it several times, and let the plants shed their seeds, and it has come up from those seeds in two years, degenerated to the wild sort.

Purslane is propagated from seeds, which may be sown upon beds of light rich earth during any of the summer months, but if you intend to have it early in the season, it should be sown upon a hot-bed, for it is too tender to be sown in the open air before April, and then it must be in a warm situation. This seed is very small, so that a little of it will be sufficient to supply a family. There is no other culture which this plant requires, but to keep it clear from weeds, and in dry weather to water it two or three times a week. In warm weather this plant will be fit for use in six weeks after sowing; so that in order to continue a succession of it, you should sow it at three or four different seasons, allowing a fortnight or three weeks between each sowing, which will be sufficient to last the whole summer, while it is proper to be eaten, for being of a very cold nature, it is unsafe to be eaten, except in the heat of summer in England; for which reason it is not to any purpose to sow it upon a hot bed, since it will come early enough for use in the open air.

If the seeds are intended to be saved, a sufficient number of the earliest plants should be left for this purpose, drawing out all those which are weak, or have small leaves, from among them; and when the seeds are ripe, the plants should be cut up, and spread upon cloths in the sun to dry, and then the seeds may be easily beaten out and sifted, to clear it from the leaves and seed-vessels.

The second sort grows naturally in most of the islands of the West-Indies. This is annual; the stalks are very succulent, of a purple colour, and branches out greatly; the lower branches lie near the ground, but those above them are more erect; the leaves are narrow, awl-shaped, and of a lucid green; they are placed alternately on the branches. At the joints there come out tufts of white hairs, and between these come out the flowers sitting close to the branches; they are of a fine pink colour, but of short duration, seldom continuing open longer than five or six hours; these are succeeded by short roundish capsules, filled with small black seeds. It flowers from the middle of June till autumn.

The third sort grows naturally at the Cape of Good Hope. This is a perennial plant, with a shrubby stalk, which rises four or five inches high, garnished with thick, globular, succulent leaves; at the top of the stalk comes forth a slender foot stalk about two inches long, sustaining four or five Rose shaped flowers, of a reddish colour. These appear in July, but are not succeeded by seeds in England. This plant is too tender to live in the open air in winter, so it must be kept in pots, and treated in the same way as the most tender succulent kinds of Fig Marygolds. It is propagated by cuttings in the same manner as they are.

POTENTILLA. *Lin. Gen. Plant. 558.* Cinquefoil.

The Characters are,

The empalement of the flower is of one leaf, which is slightly cut into ten parts; the segments are alternately less and reflexed. The flower is composed of five petals, which are inserted into the empalement, and spread open. It hath twenty awl-shaped stamina inserted in the empalement, terminated by moon-shaped summits. In the center of the flower there are several germen collected into one head, with very slender styles inserted in the side of the germen, crowned by obtuse stigmas. After the flower is past, the germen becomes a head of roundish seeds, included in the empalement.

The Species are,

1. POTENTILLA foliis pinnatis serratis, caule repente. *Flor. Lapp. 210.* Potentilla with winged sawed leaves, and a creeping stalk.

2. *POTENTILLA foliis pinnatis alternis, foliolis quinis ovatis crenatis, caule erecto.* Hort. Cliff. 193. *Potentilla* with alternate winged leaves, having five oval crenated lobes, and an erect stalk.

3. *POTENTILLA foliis pinnatis, caule fruticoso.* Hort. Cliff. 193. *Potentilla* with winged leaves and a shrubby stalk; commonly called shrubby Cinquefoil.

4. *POTENTILLA foliis digitatis lanceolatis serratis utrinque subpilosis, caule erecto.* Lin. Sp. Plant. 497. *Potentilla* with finger-shaped leaves, which are spear-shaped, sawed, hairy on both sides, with an erect stalk.

5. *POTENTILLA foliis quinatis cuneiformibus incisissubtus tomentosis, caule erecto.* Lin. Sp. Plant. 497. *Potentilla* with five wedge-shaped lobes to the leaves, which are woolly on their under side, and an erect stalk.

6. *POTENTILLA foliis digitatis apice conniventis-serratis, caulibus filiformibus procumbentibus, receptaculis hirsutis.* Hort. Cliff. 194. *Potentilla* with finger-shaped leaves, whose points are sawed, very slender trailing stalks, and hairy receptacles.

7. *POTENTILLA foliis ternatis, caule ramoso erecto, pedunculis supra genicula enatis.* Hort. Upsal. 134. *Potentilla* with leaves growing by threes, an upright branching stalk, and foot-stalks rising above the joints; or Alpine barren Strawberry.

8. *POTENTILLA foliis ternatis, foliolis ovatis obtuse crenatis, caule ramoso, pedunculis longioribus.* *Potentilla* with leaves growing by threes, the lobes whereof are oval and obtusely crenated, a branching stalk, and longer foot-stalks.

9. *POTENTILLA foliis septenis quinatisque, foliolis pinnato-incisiss pilosis, caule erecto ramoso.* *Potentilla* with seven and five leaves, whose lobes are cut, winged, hairy, and an upright branching stalk.

10. *POTENTILLA foliis septenis quinatisque, foliolis lanceolatis pinnato-dentatis utrinque pilosis, caule erecto corymbofo, petalis cordatis.* *Potentilla* with five and seven leaves, whose lobes are spear-shaped, wing-indented, and hairy on both sides, and have an erect branching stalk, with heart-shaped petals to the flower.

There are many more species of this genus, which are preserved in botannick gardens for the sake of variety, but as they are not cultivated in other places either for use or beauty, I shall not enumerate them here.

The first sort here mentioned grows naturally upon cold stiff land in most parts of *England*, and is a sure mark of the sterility of the soil. It spreads its stalks upon the ground, which send out roots from their joints, fastening into the ground, and thereby propagates so fast, as in a little time to spread over and fill the ground to a great distance. It flowers great part of summer. The leaves of this plant are used in medicine, and are accounted restrigent and vulnerary. It is never cultivated in gardens, being a very common weed in *England*.

The second sort grows naturally on the *Alps*, and mountains in *Germany*. This hath a perennial root, which sends out several heads joined together; from these arise the foot-stalks of the leaves, which are long, and sustain three pair of roundish lobes, terminated by an odd one; these are crenated on their edges, and sit close to the midrib. Out of each head arises a hairy stalk about nine inches high, divided into small foot-stalks, each sustaining two or three white flowers, very like those of the Strawberry. It is easily propagated by seeds. The best time for sowing them is in the autumn; it loves a moist soil, and a shady situation.

The third sort grows naturally in the northern counties of *England*, and in many of the northern parts of *Europe*. This hath a shrubby stalk, which rises about four feet high, dividing into many branches, garnished by winged leaves, composed of two or three pair of narrow, acute-pointed,

entire, hairy lobes, pale on their under side. The flowers are produced at the end of the branches in clusters; they have five yellow petals, spreading open in form of a Rose, with many germen and stamina within. These appear in *July*, and are sometimes succeeded by seeds inclosed in the empalement. This plant is commonly cultivated in the nursery-gardens as a flowering shrub; it is commonly propagated by suckers, or laying down the tender branches, which will take root in one year, and may then be taken off from the old plants, and planted in a nursery for a year or two to get strength, before they are planted where they are designed to remain. It may also be propagated by cuttings, which may be planted in autumn in a moist shady border, where they will take root the next spring, and the *Michaelmas* following may be transplanted into the nursery.

The best season for transplanting of these plants is in *October*, that they may get new roots before the hard frost sets in, for as this plant grows naturally upon moist boggy land, so when it is removed in the spring, if due care is not taken to water it in dry weather, it is apt to miscarry; nor will this plant live in a hot dry soil, but in a shady situation and on a cool moist soil, it will thrive exceedingly.

The fourth sort grows naturally in the south of *France* and *Italy*. This hath hand-shaped leaves, composed of five or seven lobes, which join at their base, where they meet the foot-stalk; they are deeply crenated on their sides, and are hairy on both. The stalks rise nine or ten inches high, branching toward the top. The flowers are white, shaped like those of the former sort, terminating the stalks, and are succeeded by seeds like the other. This is a biennial plant, which dies soon after the seeds are ripe. It may be propagated as the second sort.

The fifth sort grows naturally on the *Alps*, and in other rough hilly parts of *Europe*. This hath a thick fleshy root, from which arise several purple branching stalks about a foot high, garnished with leaves, composed of five wedge-shaped lobes, deeply cut on their edges, which are very hoary on their under side. The flowers grow at the top of the stalk, which branches out into many foot-stalks; they are yellow, and shaped like those of the fourth sort, but smaller. The root is perennial, and the plant may be propagated as the second sort.

The sixth sort grows on the mountains in *Austria*. This hath a perennial root; the leaves stand upon long foot-stalks, which arise immediately from the root; they are composed of five oblong lobes, which are a little sawed at their ends, very hoary and silky on their under sides, but green on their upper. The flowers are produced upon long slender foot-stalks, which arise immediately from the root; they are white, and shaped like those of the other species, but are seldom succeeded by seeds in *England*. It may be easily propagated by runners in the same manner as the Strawberry; the best time to transplant them is in autumn. It loves a cool soil and a shady situation.

The seventh sort grows naturally on the *Alps*. This is a biennial plant; the stalks grow erect, about a foot high; they are very hairy, garnished with trifoliate oblong leaves, sawed on their edges. The flowers are produced upon foot-stalks, which come out above the joints of the stalk; they are white, and very like those of the Strawberry. This plant flowers in *June*, and the seeds ripen in autumn, which, if permitted to scatter, will produce plants in plenty the following spring, which will require no other culture, but to keep them clean from weeds.

The eighth sort is also a biennial plant, but differs from the other, in having taller and stronger stalks, which branch out more; the lobes of the leaves are oval, obtuse, and bluntly indented on their edges; the flowers are larger, and the whole plant is of a deeper green. It flowers in *July*, and

and the seeds ripen in autumn. It propagates itself like the former sort.

The ninth sort grows naturally in *Italy* and *Sicily*. This is a biennial plant; the stalks rise near two feet high; they are purple and very hairy, garnished with leaves, composed of five or seven narrow lobes, which are deeply cut on their sides, so as to resemble those of winged leaves; the stalks branch out greatly toward their top. The flowers are yellow, and shaped like those of the fourth sort. It flowers in *June*, and the seeds ripen in autumn. It may be propagated as the fourth sort.

The tenth sort grows naturally in the south of *France* and *Italy*. This is a biennial plant; the stalks are large, and rise near two feet high; they branch very much toward their top; the leaves stand upon very short foot-stalks; they are sometimes composed of five, and at other times of seven lobes, which are regularly indented like winged leaves, and are very hairy on both sides. The flowers are produced at the top of the stalk, each having a foot-stalk an inch and a half long; their empalements are deeply cut into nine segments, which end in acute points. The flowers have sometimes but five, but generally six heart-shaped petals, which are of a pale yellow, and expand like those of the former sorts. It flowers in *July*, and the seeds ripen in autumn, which, if permitted to scatter, will produce plenty of plants the following spring. This requires no other culture, than to keep it clean from weeds.

POTERIUM. *Lin. Gen. Plant.* 948. Burnet.

The Characters are,

It hath male and female flowers in the same spike. The male flowers have a three-leaved empalement; they have one petal, which is cut into four parts; these are oval, concave, and permanent; they have a great number of long hair-like stamina, terminated by roundish twin summits. The female flowers have one wheel shaped petal, with a short tube, cut at the brim into four parts; these have no stamina, but two oblong oval germen, with two hairy styles the length of the petal, crowned by coloured pencil-shaped stigmas. The germen afterward becomes two hard seeds, inclosed in the petal of the flower.

The Species are,

1. POTERIUM *inermis, caulibus subangulosis.* *Hort. Cliff.* 446. Smooth Poterium with angular stalks. Burnet.

2. POTERIUM *inermis, caulibus teretibus strictis.* *Lin. Sp. Plant.* 994. Smooth Poterium with a narrow taper stalk.

3. POTERIUM *spinis ramosis.* *Hort. Cliff.* 445. Poterium with branching spines; or Prickly ever-green Burnet.

The first sort is the common Burnet, which grows naturally upon chalky lands in many parts of *England*. Of this there are two or three varieties, one of them is much smoother than the other, and the third hath larger seeds than either of the former; but these differences are not constant, so they are only seminal variations. This is a perennial plant, from whose root arise a great number of leaves, standing on pretty long foot-stalks, composed of five or six pair of lobes, terminated by an odd one. The lobes are generally ranged a little alternate on the midrib, but sometimes stand by pairs; these are sawed on their edges, and are sometimes smooth, and at others hairy. The stalks rise a foot and a half high, branching out pretty much, and are terminated by long slender foot-stalks, each sustaining an oblong spike of flowers, in which there are some male and others female; they are of a purplish red colour, and appear in *June*. The female flowers are each succeeded by two hard seeds, which ripen in autumn.

This plant is propagated in gardens; the young tender leaves are put into sallads, and the leaves are used for cool tankards in hot weather. It is used in medicine, and is reckoned to be cordial and alexipharmick. The powder of the root is commended against spitting of blood.

This plant is easily propagated by seeds, which should be sown in autumn, for if it is sown in spring, the seeds frequently lie in the ground till the spring following. If the seeds are permitted to scatter, the plants will come up in plenty; if these are transplanted out in a bed of undunged earth, at about a foot distance every way, and kept clean from weeds, they will continue several years, especially if the soil is dry, and will require no other care. It may also be propagated by parting of the roots in the autumn, but as the plants arise so freely from scattered seeds, the latter method is seldom practised.

The second sort grows naturally in the south of *France* and *Italy*. This is a biennial plant, which decays soon after the seeds are ripe. The leaves of this are like those of Agrimony, and are composed of three or four pair of oblong lobes, placed a little alternate on the midrib, and terminated by an odd one; they are deeply sawed on their edges, and have an agreeable scent; the stalks rise two feet high, garnished at each joint with one of those winged leaves, which gradually diminish in their size to the top, and just above the leaf arises a long foot-stalk, which supports two or three small ones, each sustaining a small roundish spike of flowers. These appear in *July*, and are succeeded by seeds, which ripen in autumn. It is propagated by seeds, which, if sown in autumn, the plants will come up the following spring. These require no other culture than to thin them where they are too close, and keep them clean from weeds; the second year they will flower and ripen their seeds, and soon after decay.

The third sort grows naturally in *Crete*, and in many of the islands of the *Archipelago*. This hath a shrubby perennial stalk, which rises about three feet high, dividing into several slender branches, which are armed with branching sharp thorns; the leaves are very small; they are winged, and have six or seven pair of very small lobes, ranged opposite along the midrib, terminated by an odd one; they are of a lucid green, and continue all the year. The flowers are produced in small heads at the end of the branches, and are of an herbaceous colour.

This plant is too tender to live through the winter in the open air, but if it is sheltered under a common hot-bed frame in winter, where it may have the free air at all times when the weather is mild, and sheltered from hard frost, it will thrive better than when it is more tenderly treated. It may be propagated by slips or cuttings during any of the summer months, which, if planted in a bed of light earth, and covered down close with a hand or bell-glass, and shaded from the sun, will take root freely, and may then be taken up and planted each into a separate small pot, filled with fresh undunged earth, and placed in the shade till they have taken new root, and then removed to a sheltered situation, where they may stand till the frost comes on, when they should be placed under the hot-bed frame. It requires but little water, especially in cool weather, and wants no particular culture.

PRASIUM. *Lin. Gen. Plant.* 655. Shrubby Hedge-nettle.

The Characters are,

The flower hath a bell-shaped empalement of one leaf, divided into two lips; the upper lip ends in three acute points; the lower lip is cut into two parts. The flower is of the lip kind; it hath one petal; the upper lip is oval, erect, and indented at the end. The lower lip is reflexed, and ends in three points, the middle one being broadest. It has four awl-shaped stamina under the upper lip, two of which are shorter than the other, having oblong summits on their side, and a four-pointed germen, sustaining a slender style the length of the stamina, crowned by a bifid stigma. The germen afterward becomes four berries, each containing a single roundish seed.

The Species are,

1. PRASIUM *foliis ovato-oblongis serratis*. Lin. Hort. Cliff. 309. Shrubby stinking Hedge-nettle, with oblong, oval, sawed leaves.

2. PRASIUM *foliis ovatis, duplici utrinque crenâ notatis*. Lin. Hort. Cliff. 309. Shrubby stinking Hedge-nettle, with oval leaves, which are indented on every side.

The first sort grows naturally in *Spain* and *Italy*. This rises with a shrubby stalk near three feet high, covered with a whitish bark, divided into many branches, garnished with oblong oval leaves, which are sawed on their edges. The flowers come out from the bosom of the leaves in whorls round the stalks; they are white, and have large permanent empalements, cut into five points. The flowers are of the lip kind; they appear in *June* and *July*, and are succeeded by four small berries sitting in the empalement, which turn black when they are ripe, and have a single roundish seed in each.

The second sort grows naturally in *Sicily*. This hath a shrubby stalk like the former, but rises a little higher; the bark is whiter, the leaves are shorter and oval, and are doubly crenated on each side; they are of a lucid green. The flowers come out in small whorls from the bosom of the leaves, like the former; they are somewhat larger, and are frequently marked with a few purple spots; these are succeeded by small berries like the other sort, which ripens at the same time.

These plants may be propagated either by cuttings, or from the seeds: if they are propagated by cuttings, they should be planted on a shady border toward the end of *April*; but the cuttings should not be taken from such plants as have been drawn weak, but rather from those which have been exposed to the open air, whose shoots are short and strong; and if a joint of the former year's wood is cut to each of them, they will more certainly succeed. These cuttings may remain in the same border till they are well rooted, when they may be transplanted into the places where they are to remain, or into pots, that they may be sheltered in winter under a common frame, where they may have as much free air as possible in dry weather, but only require to be screened from hard frost.

If they are propagated by seeds (which the plants produce in plenty every year) they should be sown on a bed of light earth in *April*; and in *May* the plants will come up, when they require no other care but that of keeping them clean from weeds; and in the autumn following they may be transplanted in the same manner as before directed for those raised from cuttings, and may be afterward treated more hardily, as they acquire strength.

A plant or two of each of these species may be allowed to have a place where there are collections of the different sorts of ever-green shrubs, for the sake of variety, especially where the different sorts of *Cistus*, *Phlomis*, *Tree-wormwood*, and *Medicago*, are admitted, because these are equally hardy; and when a severe winter happens, which destroys the one, the others are sure of the same fate; but in mild winters they will live abroad, especially if they are planted in a dry rubbishy soil, and have a sheltered situation, but on wet ground the plants will grow very vigorous in summer, so are liable to injury from the early frosts in autumn.

PRENANTHES. Lin. Gen. Plant. 816. Vaill. Mem. Ann. 1721. Wild Lettuce.

The Characters are,

It hath a smooth cylindrical empalement, having many scales, which are equal, but have three at the base unequal. This common empalement includes from five to eight hermaphrodite florets, disposed in a single round order; they have one petal, which is stretched out like a tongue, and indented in four parts at the end; they have five short hair-like stamina, terminated by cylindrical

summits. The germen is situated under the petal, supporting a slender style longer than the stamina, crowned by a bifid reflexed stigma. The germen afterward becomes a single heart-shaped seed, crowned with hairy down.

The Species are,

1. PRENANTHES *flosculis quinis, foliis lyrato-hastatis*. Hort. Cliff. 383. Prenanthes with five florets, and lyre-spear-shaped leaves.

2. PRENANTHES *flosculis quinis, foliis lanceolatis denticulatis*. Hort. Cliff. 383. Prenanthes with five florets, and spear-shaped indented leaves.

3. PRENANTHES *erecta, flosculis quinis foliis trilobis*. Lin. Sp. Plant. 797. Upright Prenanthes with five florets, and leaves having three lobes.

4. PRENANTHES *flosculis quinis, caule ramoso, foliis ovato-lanceolatis semiamplexicaulibus*. Prenanthes with five florets, a branching stalk, and oval spear-shaped leaves half embracing the stalk.

The first sort grows naturally upon walls and dry shady banks in many parts of *England*, so is never cultivated in gardens.

The second sort grows naturally upon the *Helvetian* mountains. This hath a creeping root, which spreads far in the ground, so becomes a troublesome weed, if admitted into gardens. The stalks of this rise four feet high; the leaves are spear-shaped, and a little indented toward their ends; the flowers are of a purple blue colour, and are produced in panicles from the sides, and at the top of the stalks. These appear in *July*, and are succeeded by seeds which ripen in autumn.

The third sort grows naturally in most parts of *North America*, where it is called Dr. Witt's Rattlesnake root. This seldom lives longer than two years. The lower leaves are four or five inches long, and three broad; they are sometimes divided into five lobes, but generally into three; they are indented a little on their edges, smooth, of a dark green on their upper side, but pale on their under. The stalks rise three feet high, and are garnished with a few small leaves, which are entire; the flowers come out from the side of the stalk in small bunches; these are of a pale yellow colour, and appear in *July*. They are succeeded by seeds, crowned with hairy down, which ripen in autumn. There is a variety of this with pale purple flowers, which arises from the same seeds. The roots of these plants are said to be an antidote to expel the venom of the Rattlesnake, which induced me to mention these plants.

The fourth sort grows naturally on the mountains in *Germany*. This hath a perennial root. The stalks rise a foot high, and branch out on each side; the leaves are spear-shaped and oval; their base is broad, and half surrounds the stalk; the flowers grow loosely upon slender foot stalks, which come out from the side, and at the end of the branches. These appear in *June*, and the seeds ripen in autumn.

These plants are seldom admitted into gardens, but if any person is desirous to cultivate them, if they sow the seeds soon after they are ripe in a shady situation, the plants will come up, and require no other care but to keep them clear from weeds.

PRIMULA. Lin. Gen. Plant. 180. The Primrose.

The Characters are,

The flower hath a tubulous empalement of one leaf, ending in five acute points; it hath one petal, with a cylindrical tube, but spreads open above, where it is cut into five heart-shaped segments. It has five short stamina, situated in the neck of the petal, terminated by erect acute-pointed summits, and a globular germen, supporting a slender style, crowned by a globular stigma. The germen afterward turns to an oblong capsule, with one cell opening at the top, filled with small angular seeds.

The

The Species are,

1. PRIMULA *foliis dentatis rugosis, pedunculis unifloris.* Primrose with rough indented leaves, and foot-stalks bearing one flower; or common Primrose.

2. PRIMULA *foliis dentatis rugosis, floribus fastigiatis.* Primrose with rough indented leaves, and flowers growing in bunches; called Cowslip.

3. PRIMULA *foliis cuneiformibus glabris, segmentis corollarum bifidis.* Primrose with smooth wedge-shaped leaves, and bifid segments to the empalement; called Birds-eyen.

4. PRIMULA *foliis petiolatis subcordatis crenatis, floribus fastigiatis pedunculis longissimis.* Primrose or Cowslip with heart-shaped crenated leaves, having foot-stalks, and flowers growing in bunches on very long foot-stalks.

The first sort of Primrose grows wild in woods, and other shady places in most parts of *England*, from whence their roots may be easily transplanted into the garden, where, if they are placed under hedges, and in shady walks, they make a beautiful appearance early in the spring, when few other plants are in flower.

This plant is so well known as to need no description; the flowers and roots of this are used in medicine.

There are several varieties of this, which have been accidentally obtained, as the common Primrose with double flowers; the red Primrose with single and double flowers; these have but one flower upon a foot-stalk, but the Paper-white Primrose is certainly a distinct species.

The second sort is the Cowslip, or Paigle, or Paralysis of the shops. This grows naturally in meadows and moist pastures in many parts of *England*. The flowers of this sort grow in bunches on the top of the foot-stalk, so are easily distinguished from the former; the flowers are much used in medicine, and sometimes the leaves. As these grow wild, their roots may be taken up, and transplanted into gardens.

The best time to transplant them is at *Michaelmas*, that their roots may have strength to produce their flowers early in the spring. These delight in a strong rich soil, but will grow in almost any sort of earth, provided they have a shady situation.

There are a great variety of this at present in the gardens, as the Hose in Hose, the double Cowslip, and all the sorts of Polyanthus, which have been so much improved within the last fifty years, as to almost equal the variety of the Auriculas; and in some parts of *England* they are so much esteemed as to sell for a guinea a root, so that there may be still a much greater variety raised, as there are so many persons engaged in the culture of this flower.

The several varieties of Polyanthus are produced by sowing of seeds, which should be saved from such flowers as have large upright stems, producing many flowers upon a stalk, which are large, beautifully striped, open flat, and not Pin-eyed. From the seeds of such flowers there is room to hope for a great variety of good sorts, but there should be no ordinary flowers stand near them, lest, by the mixture of their farina, the seeds should be degenerated.

These seeds should be sown in boxes filled with light rich earth in *December*, being very careful not to bury the seed too deep, for if it be only slightly covered with light earth, it will be sufficient. These boxes should be placed where they may have the benefit of the morning sun until ten of the clock, but must by no means be exposed to the heat of the day, especially when the plants begin to appear, for at that time one whole day's sun will entirely destroy them. In the spring, if the season should prove dry, you must often refresh them with water, and, as the heat increases, you should remove the boxes more in the shade, for the heat is very injurious to them.

By the end of *May* these plants will be strong enough to

plant out, at which time you should prepare some shady borders, which should be made rich with neats dung, upon which you must set the plants about four inches asunder every way, observing to water them until they have taken root; after which they will require no farther care but to keep them clear from weeds, until the latter end of *August* following, when you should prepare some borders, which are exposed to the east, with good light rich earth, into which you must transplant your Polyanthus, placing them six inches asunder equally in rows, observing, if the season proves dry, to water them until they have taken root. In these borders your plants will flower the succeeding spring, at which time you must observe to mark such of them as are fine to preserve, and the rest may be transplanted into wilderesses, and other shady places in the garden, where, although they are not very valuable flowers, they will afford an agreeable variety.

Those which you intend to preserve, may be removed soon after they have done flowering (provided you do not intend to save seeds from them), and may be then transplanted into a fresh border of the like rich earth, allowing them the same distance as before, observing also to water them until they have taken root; after which they will require no farther care, but only to keep them clean from weeds, and the following spring they will produce strong flowers, as their roots will be then in full vigour; so that, if the kinds are good, they will be little inferior to a shew of Auriculas.

These roots should be constantly removed and parted every year, and the earth of the border changed, otherwise they will degenerate, and lose the greatest part of their beauty.

If you intend to save seeds, which is the method to obtain a great variety, you must mark such of them, which, as I said before, have good properties. These should be, if possible, separated from all ordinary flowers, for if they stand surrounded with plain-coloured flowers, they will impregnate each other, whereby the seeds of the valuable flowers will not be near so good, as if the plants had been in a separate border, where no ordinary flowers grew; therefore the best way is to take out the roots of such as you do not esteem as soon as the flowers open, and plant them in another place, that there may be none left in the border, but such as you would chuse for seeds.

The flowers of these should not be gathered, except such as are produced singly upon pedicles, leaving all such as grow in large bunches; and if the season should prove dry, you must now and then refresh them with water, which will cause their seeds to be larger, and in greater quantity, than if they were entirely neglected. In *June* the seed will be ripe, which may be easily known by the pods changing brown, and opening; so that you should at that time look over the plants three times a week, gathering each time such of the seed-vessels as are ripe, which should be laid upon a paper to dry, and may then be put up until the season of sowing.

As the plants, which arise from seeds, generally flower much better than offsets, those who would have these flowers in perfection, should annually sow their seeds.

PRIMROSE-TREE. See Onagra.

PRINOS. *Lin. Gen. Plant.* 398. Winterberry.

The Characters are,

The flower hath a permanent empalement of one leaf, which is cut into six small plain segments. It hath one wheel-shaped petal, with no tube, cut into six plain segments; it hath six awl shaped stamina, shorter than the petal, terminated by obtuse summits, and an oval germen, sitting upon the style, crowned by an obtuse stigma. The germen afterward turns to a round berry, opening in three parts, including one hard seed.

The Species are,

1. PRINOS foliis longitudinaliter serratis. Lin. Sp. Plant. 330. Prinos, or Winterberry, with leaves sawed length-ways.

2. PRINOS foliis apice serratis. Lin. Sp. Plant. 330. Prinos with leaves sawed at the points.

The first sort grows naturally in *Virginia*, and other parts of *North America*. This rises with a shrubby stalk to the height of eight or ten feet, sending out many branches, garnished with spear-shaped leaves, terminating in acute points, veined on their under side, and sawed on their edges, having slender foot stalks standing alternately on the branches. The flowers come out from the side of the branches, sometimes single, at others two or three at each joint; they have no tube, but are wheel-shaped, and cut into six parts; they have six awl-shaped erect stamina, terminated by obtuse summits, and an oval germen, sitting upon the style, crowned by an obtuse stigma; these are succeeded by berries about the size of those of *Holly*, which turn purple when ripe. It flowers in *July*, and the seeds ripen in the winter.

The second sort grows naturally in *Canada*. This is of lower growth than the former. The leaves are shorter, and sawed at their points, but the flowers of this I have not seen.

It is propagated by seeds, which should be sown soon after they are ripe upon a bed of light earth, covering them about one inch deep. The seeds, which are so soon put into the ground, will many of them come up the following spring, whereas those, which are kept longer out of the ground, will remain a whole year before the plants will appear, in the same manner as the *Holly*, *Hawthorn*, and some others; therefore the ground should not be disturbed, if the plants do not come up the first year. The young plants may be treated in the same manner as hath been directed for the *American Hawthorns*, and are full as hardy, but they delight in a moist soil and a shady situation, for in hot land they make but little progress, and rarely produce any fruit.

PRIVET. See *Ligustrum*.

PROTEA. Lin. Gen. Plant. 104. Silver-tree.

The Characters are,

The flowers are collected in an oval head; they have one common imbricated scaly perianthium. The flower is of one petal, having a tube the length of the empalement; the brim is cut into four parts, which spread open, and are equal. It has four bristly stamina the length of the petal, terminated by incumbent summits, and a roundish germen with an erect bristly style, crowned by an obtuse stigma. The germen afterward turns to a roundish naked seed, sitting in a distinct cell of the cone.

The Species are,

1. PROTEA foliis lineari-lanceolatis integerrimis, superioribus hirsutis nitidis. Prod. Leyd. 184. Protea with linear, spear-shaped, entire leaves; the upper of which shine, and are hairy.

2. PROTEA foliis lanceolatis integerrimis acutis hirsutis nitidis. Hort. Cliff. 29. Protea with entire, spear-shaped, acute, hairy, shining leaves; commonly called Silver-tree.

3. PROTEA foliis oblongo-ovatis hirsutis nitidis integerrimis. Protea with oblong, oval, hairy, shining leaves, which are entire; called Wageboom.

These plants are natives of the country near the *Cape of Good Hope* in *Africa*, where there is a great number of species. In the catalogue of the *Leyden* garden there are upward of twenty sorts enumerated; not that they have them growing there, but they have good drawings of them, which were made in the country, where they are natives. The three sorts here mentioned are what I have now growing in the *Chelsea* garden.

As these plants are natives of the *Cape of Good Hope*, they are too tender to live abroad through the winter in *England*, but the first sort is hardy enough to live in a good green-house. This sort will grow to the height of ten or twelve feet, and may be trained up with a regular strait stem; the branches naturally form a regular large head. The leaves are long and narrow, of a shining silver colour; and, as they remain the whole year, the plants make a fine appearance, when they are intermixed with others in the green-house. In the summer these may be placed in the open air in a sheltered situation, for, if they are exposed to winds, the plants will be torn, and rendered unsightly, nor will they make any progress in their growth. In warm weather they must be frequently but sparingly watered, and in cold weather this must not be too often repeated, lest it should rot their fibres.

The second sort hath a strong upright stalk, covered with a purplish bark, dividing into several branches, which grow erect, garnished with broad, shining, silvery, spear-shaped leaves, which make a fine appearance, when intermixed with other exoticks. This should be placed in an airy dry glass-case, where it may be protected from cold, and have as much light as possible, and in winter should have little water; it rises easily from seeds. The seeds will sometimes remain in the ground six or eight months, and at other times the plants will appear in six weeks; therefore the best way is to sow the seeds in small pots filled with soft sandy loam, and plunge them into a moderate hot-bed; and, if the plants should not come up so soon as expected, the pots should remain in shelter till the following spring, when, if the seeds remain sound, the plants will come up. The pots, in which the seeds are sown, should have but little wet, for moisture frequently causes them to rot. When the plants appear, they should not be too tenderly treated, for they must not be kept too warm, nor should they have much wet; but in warm weather they must be exposed to the open air in a sheltered situation, and in winter protected from frost.

The third sort I raised from seeds, which came from the *Cape of Good Hope*; these seeds were long and slender, very different in shape from those of the second sort, but the plants have great resemblance to them. The leaves are very silky and white; the stalks are purple, and grow erect, but have not as yet put out any branches.

The first sort may be propagated by cuttings, which should be cut off in *April*, just before the plants begin to shoot; they should be planted in small pots, filled with light earth, and plunged into a moderate hot-bed, shading them from the sun, and now and then gently refreshing them with water, but it must be sparingly given, for much wet will rot them. These cuttings will put out roots by *Midsummer*, when they may be gently shaken out of the pots, and parted, planting each in a separate small pot filled with light earth, and place them in a frame, where they may be shaded till they have taken new root; then they should be gradually inured to the open air, into which they should be removed, and treated in the same way as the old plants.

PRUNELLA. Lin. Sp. Plant. 600. Self-heal.

The Characters are,

The flower has a permanent empalement, divided into two lips; it is of the ringent kind, having one petal with a short tube, and oblong chaps; the upper lip is entire and concave; the under lip is trifid; the middle segment is broad, and indented at the point; it has four awl-shaped stamina, two long and two shorter, and four germen, supporting a slender style, crowned by an indented stigma. The germen becomes four seeds inclosed in the empalement.

The Species are,

1. PRUNELLA foliis oblongo-ovatis petiolatis. Lin. Sp. Plant. 600. Greater Self-heal with oblong oval leaves.

2. PRUNELLA

2. PRUNELLA *foliis oblongo-ovatis laciniatis*. Self-heal with oblong, oval, jagged leaves.

3. PRUNELLA *foliis lanceolato-linearibus ciliatis subsessilibus*. Sauv. Monsp. 141. Self-heal with Hyssop leaves.

4. PRUNELLA *foliis lanceolato-linearibus, internodiis longissimis spicis interruptis*. Canada Self-heal with narrow leaves, and the joints of the stalk very distant.

5. PRUNELLA *foliis oblongis pinnato-sinuatis villosis infimis petiolatis summis sessilibus*. Self-heal with oblong, wing-pointed, hairy leaves.

6. PRUNELLA *foliis lineari-lanceolatis pinnato-incisis subsessilibus spicis interruptis*. Self-heal with vervain leaves, sitting close to the stalks, and interrupted spikes of flowers.

7. PRUNELLA *foliis lanceolatis integerrimis, infimis petiolatis, summis sessilibus, internodiis prælongis, spicis crassioribus*. Carolina Self-heal with entire leaves, and thick spikes of flowers.

8. PRUNELLA *bracteis pinnato-dentatis ciliatis*. Læfl. desc. 31. Portugal Self-heal with sweet flowers.

The first sort, which is used in medicine, grows naturally in pastures every where. The leaves are in shape a long oval; the stalks are square, rise about eight inches high, and are terminated by a close spike of flowers, which are for the most part blue, but sometimes are white. It flowers in June and July, and the seeds ripen in August and September. The second sort differs from the first, in having jagged leaves.

The third sort has very narrow leaves, which are covered with small hairs, and sit close to the stalks.

The fourth sort, which came originally from Canada, has very narrow leaves; the joints of the flower-stalk are far asunder, and the spikes of flowers are separated.

The fifth sort has hairy cut leaves, and sulphur-coloured flowers.

The seventh sort was brought from Carolina. The leaves of this are spear-shaped and entire; the flower-stalk is tall, the joints very distant, and is terminated by a thick spike of pale blue flowers.

The eighth sort grows naturally in Portugal and Spain. The leaves of this are finely cut, and are set with fine soft hairs; the stalk rises higher than most of the other sorts, and is terminated by spikes of blue flowers, which have an agreeable scent.

All these plants are hardy, so will thrive in the open air. They are easily propagated by seeds, which, if sown in the autumn, will more certainly succeed than those sown in the spring; or if their seeds are permitted to scatter, the plants will rise without any trouble, but if the sorts stand near each other, there will be some difficulty to keep them distinct, when their seeds fall to the ground. The plants want no other care but to be thinned to proper distances, and kept clean from weeds. They are not of long duration, so that whoever would keep the sorts, should sow their seeds annually, but as they are not very ornamental, so they are seldom preserved in gardens, unless by such as are curious in botany.

PRUNING OF TREES. There is not any part of gardening which is of more general use than that of pruning, and yet it is very rare to see fruit-trees skilfully managed. Almost every gardener will pretend to be a master of this business, though there are but few who rightly understand it, nor is it to be learned by rote, but requires a strict observation of the different manners of growth of the several sorts of fruit-trees, some requiring to be managed one way, and others must be treated in a quite different method, which is only to be known from carefully observing how each kind is naturally disposed to produce its fruit, for some sorts produce their fruit on the same year's wood, as Vines; others produce their fruit, for the most part, upon

the former year's wood, as Peaches, Nectarines, &c. and others upon cursons or spurs, which are produced upon wood of three, four, or five, to fifteen or twenty years old, as Pears, Plums, Cherries, &c. therefore, in order to the right management of fruit-trees, there should always be provision made to have a sufficient quantity of bearing wood in every part of the trees, and at the same time there should not be a superfluity of useless branches, which would exhaust the strength of the trees, and cause them to decay in a few years.

The reasons which have been laid down for pruning of fruit-trees are as follow: first, To preserve trees longer in a vigorous bearing state; the second is, To render the trees more beautiful to the eye; and thirdly, To cause the fruit to be larger and better tasted.

1. It preserves a tree longer in a healthy bearing state; for by pruning off all superfluous branches, so that there are no more left upon the tree than are necessary, or than can be properly nourished, the root is not exhausted in supplying useless branches, which must afterwards be cut out, whereby much of the sap will be uselessly expended.

2. By skilful pruning of a tree it is rendered much more pleasing to the eye; but here I would not be understood to be an advocate for a sort of pruning, which I have seen too much practised of late, viz. the drawing a regular line against the wall, according to the shape or figure they would reduce the tree to, and cutting all the branches, strong or weak, exactly to the chalked line; the absurdity of which practice will soon appear to every one who will be at the pains of observing the difference of those branches shooting the succeeding spring. All therefore that I mean by rendering a tree beautiful is, that the branches are all pruned according to their several strengths, and are nailed at equal distances, in proportion to the different sizes of their leaves and fruit, and that no part of the wall (so far as the trees are advanced) be left unfurnished with bearing wood. A tree well managed, though it does not represent any regular figure, yet will appear very beautiful to the sight, when it is thus dressed, and nailed to the wall.

3. It is of great advantage to the fruit; for the cutting away all useless branches, and shortening all the bearing shoots according to the strength of the tree, will render the tree more capable to nourish those which are left remaining, so that the fruit will be much larger, and better tasted. And this is the advantage which those trees against walls or espaliers have to such as are standards, which are permitted to grow as they are naturally inclined; for it is not their being trained either to a wall or espalier, which renders their fruit so much better than standards, but because the roots have a less quantity of branches and fruit to nourish, and consequently their fruit will be larger and better tasted.

The reasons for pruning being thus exhibited, the next thing is the method of performing it; but this being fully handled under the several articles of the different kinds of fruit, I shall not repeat it again in this place, and therefore shall only add some few general instructions, which are necessary to be understood, in order to the right management of fruit-trees.

There are many persons who suppose that, if their fruit-trees are but kept up to the wall or espalier, during the summer season, so as not to hang in very great disorder, and in winter to get a gardener to prune them, it is sufficient, but this is a mistake; for the greatest care ought to be employed about them in the spring, when the trees are in vigorous growth, which is the only proper season to procure a quantity of good wood in the different parts of the tree, and to displace all useless branches as soon as they are produced, whereby the vigour of the tree will be entirely

tirely distributed to such branches only as are designed to remain, which will render them strong, and more capable to produce good fruit; whereas, if all the branches are permitted to remain which are produced, some of the more vigorous will attract the greatest share of the sap from the tree, whereby they will be too luxuriant for producing fruit, and the greatest part of the other shoots will be starved, and rendered so weak, as not to be able to produce any thing else but blossoms and leaves (as hath been before mentioned); so that it is impossible for a person, let him be ever so well skilled in fruit trees, to reduce them into any tolerable order by winter-pruning only, if they are wholly neglected in the spring.

There are others who do not entirely neglect their trees during the summer season, as those before mentioned, but yet do little more good to them by what they call summer-pruning; for these persons neglect their trees at the proper season, which is in *April* and *May*, when their shoots are produced, and only about *Midsummer* go over them, nailing in all their branches, except such as are produced fore-right from the wall, which they cut out, and at the same time often shorten most of the other branches, which is almost as bad as the other; for those branches, which are intended for bearing the succeeding year, should not be shortened during the time of their growth, which will cause them to produce one or two lateral shoots from the eyes below the place where they were stopped, which shoots will draw much of the strength from the buds of the first shoot, whereby they are often flat, and do not produce their blossoms; and, if those two lateral shoots are not entirely cut away at the winter-pruning, they will prove as injurious to the tree; for the shoots, which these produce, will be what the *French* call water-shoots; and in suffering those luxuriant shoots to remain upon the tree until *Midsummer* before they are displaced, they will exhaust a great share of the nourishment from the other branches (as was before observed); and, by shading the fruit all the spring, when these are cut away, and the other branches fastened to the wall, the fruit, by being so suddenly exposed, will receive a very great check, which will cause their skins to grow tough, and thereby render them less delicate. This is to be chiefly understood of stone-fruit and Grapes, but Pears and Apples, being much hardier, suffer not so much, though it is a great disadvantage to those also to be thus managed.

It must also be remarked, that Peaches, Nectarines, Apricots, Cherries, and Plums, are always in the greatest vigour, when they are the least maimed by the knife, for where these trees have large amputations, they are very subject to gum and decay; so that it is certainly the most prudent method carefully to rub off all useless buds when they are first produced, and pinch others, where new shoots are wanted to supply the vacancies of the wall; by which management trees may be so ordered, as to want but little of the knife in winter-pruning, which is the surest way to preserve these trees healthful, and is performed with less trouble than the common method.

The management of Pears and Apples is much the same with these trees in summer, but in winter they must be very differently pruned; for as Peaches and Nectarines for the most part produce their fruit upon the former year's wood, therefore they must have their branches shortened, according to their strength, in order to produce new shoots for the succeeding year; so Pears, Apples, Plums, and Cherries, on the contrary, producing their fruit upon cursons or spurs, which come out of the wood of five, six, or seven years old, should not be shortened, because thereby those buds, which were naturally disposed to form these cursons or spurs, would produce wood branches, whereby the trees would be filled with wood, but never produce much

fruit; and, as it often happens that the blossom-buds are first produced at the extremity of the last year's shoot, by shortening the branches, the blossoms are cut away, which should always be carefully avoided.

There are several authors who have written on the subject of pruning in such a prolix manner, that it is impossible for a learner to understand their meaning. These have described the several sorts of branches, which are produced on fruit-trees, as wood branches, fruit branches, irregular branches, false branches, and luxuriant branches, all which they assert every person, who pretends to pruning, should distinguish well; whereas, there is nothing more in all this but a parcel of words to amuse the reader, without any real meaning, for all these are comprehended under the description already given of luxuriant or useless branches, and such as are termed useful or fruit bearing branches; and, where due care is taken in the spring of the year to displace these useless branches (as was before directed), there will be no such thing as irregular, false, or luxuriant branches at the winter-pruning, therefore it is to no purpose to amuse people with a cant of words, which, when fully understood, signify just nothing at all.

In pruning of standard-trees you should never shorten their branches, unless it be where they are very luxuriant, and grow irregular on one side of the tree, attracting the greatest part of the sap of the tree, whereby the other parts are unfurnished with branches, or rendered very weak, in which case the branch should be shortened down as low as is necessary, to obtain more branches, to fill up the hollow of the trees; but this is only to be understood of Pears and Apples, which will produce shoots from wood of three, four, or more years old, whereas most sorts of stone-fruit will gum and decay after such amputations.

But from hence I would not have it understood, that I would direct the reducing of these trees into an exact spherical figure, since there is nothing more detestable than to see a tree (which should be permitted to grow as it is naturally disposed, with its branches produced at proportionable distances, according to the size of the fruit), by endeavouring to make the head exactly regular, so crowded with small weak branches as to prevent the air from passing between them, which will render it incapable to produce fruit. All that I intend by this stopping of luxuriant branches, is only when one or two such happen on a young tree, where they entirely draw all the sap from the weaker branches, and starve them; then it is proper to use this method, which should be done in time, before they have exhausted the roots too much.

Whenever this happens to stone-fruit, which suffer much more by cutting than the former sorts, it should be remedied by stopping or pinching those shoots in the spring, before they have obtained too much vigour, which will cause them to push out side branches, whereby the sap will be diverted from ascending too fast to the leading branch (as hath been directed for wall trees), but this must be done with caution.

You must also cut out all dead or decaying branches, which cause their heads to look very ragged, especially at the time when the leaves are upon the tree, these, being destitute of them, have but a despicable appearance. In doing of this, you should observe to cut them close down to the place where they were produced, otherwise that part of the branch left will decay, and prove equally hurtful to the tree; for it seldom happens, when a branch begins to decay, that it does not die quite down to the place where it was produced, and, if permitted to remain long uncut, does often infect some of the other parts of the tree. If the branches are large which you cut off, it will be very proper, after having smoothed the cut part exactly even with

with a knife, chissel, or hatchet, to put on a plaster of grafting clay, which will prevent the wet from soaking into the tree at the wounded part.

All such branches as run cross each other, should also be cut out, for these not only occasion a confusion in the head of the tree, but, by lying over each other, rub off their bark by their motion, and very often occasion them to canker to the great injury of the tree, and on old trees (especially Apples) there are often young vigorous shoots from the old branches near the trunk, which grow upright into the head of the trees. These therefore should carefully be cut out every year, lest, by being permitted to grow, they fill the tree too full of wood, which should always be guarded against, since it is impossible for such trees to produce so much, or so good fruit as those, whose branches grow at a farther distance, whereby the sun and air freely pass between them in every part of the tree.

These are all the general directions which are proper to be given in this place, since not only the particular methods, but also the proper seasons for pruning all the different kinds of fruit, are fully exhibited under their several articles.

PRUNUS. *Tourn. Inst. R. H. 622. tab. 398.* The Plum-tree.

The Characters are,

The flower hath a bell-shaped empalement, cut into five points; it hath five large roundish petals, which are inserted in the empalement, and from twenty to thirty stamina, which are near as long as the petals, and are also inserted in the empalement, terminated by twin summits. It has a roundish germen, supporting a slender style, crowned by an orbicular stigma. The germen afterward turns to a roundish fruit, inclosing a nut of the same form.

The Species are,

1. PRUNUS *fructu parvo præcoci. Tourn.* The Jehanâtive, or white Primordian. This is a small longish Plum, of a clear yellowish colour, covered over with a white flew, which easily wipes off; it is a pretty good bearer, and, for its coming very early, may have a place in a large garden of fruit, but it is meally, and has little flavour. This ripens the middle of July.

2. PRUNUS *fructu magno crasso subacido. Tourn.* Damas noir hâtive, *i. e.* the early black Damask, commonly called the Morocco Plum. This is a middle sized Plum, of a round shape, divided with a furrow (like Peaches). The outside is of a dark black colour, covered with a light Violet bloom; the flesh is yellow, and parts from the stone. It ripens the beginning of August, and is esteemed for its goodness.

3. PRUNUS *fructu parvo dulci atro-cæruleo. Tourn.* The little black Damask Plum. This is a small black Plum, covered with a light Violet bloom. The juice is sugared; the flesh parts from the stone; it is a good bearer, and ripens the middle of August.

4. PRUNUS *fructu magno dulci atro-cæruleo. Tourn.* Gros Damas Violet de Tours, *i. e.* great Damask Violet of Tours. This is a pretty large Plum, inclining to an oval shape. The outside is of a dark blue, covered with a Violet bloom; the juice is richly sugared; the flesh is yellow, and parts from the stone. It ripens the middle of August.

5. PRUNUS *fructu rotundo atro-rubente.* The Orleans Plum. The fruit is so well known, that it is needless to describe it; it is a very plentiful bearer, which has occasioned its being so generally planted by those persons who supply the markets with fruit, but it is an indifferent Plum. It ripens the middle of August.

6. PRUNUS *fructu oblongo atro-rubente.* The Fotheringham Plum. This fruit is somewhat long, deeply furrowed in the middle. The flesh is firm, and parts from the stone; the juice is very rich. This ripens in the middle of August.

7. PRUNUS *fructu nigro, carne durâ. Tourn.* The Perdigron Plum. This is a middle-sized Plum, of an oval shape. The outside is of a very dark colour, covered over with a Violet bloom; the flesh is firm, and full of an excellent rich juice. This is greatly esteemed by the curious. It ripens the end of August.

8. PRUNUS *fructu magno è violaceo rubente suavissimo saccharato. Tourn.* The Violet Perdigron Plum. This is a large fruit, rather round than long, of a bluish red colour on the outside. The flesh is of a yellowish colour, pretty firm, and closely adheres to the stone; the juice is of an exquisite rich flavour. This ripens the end of August.

9. PRUNUS *fructu ovato ex albo flavescente.* The white Perdigron Plum. This is a middling Plum, of an oblong figure. The outside is yellow, covered with a white bloom; the flesh is firm, and tolerably well tasted. It is much esteemed for sweat-meats, having an agreeable sweetness, mixed with an acidity. It ripens the end of August.

10. PRUNUS *fructu ovato magno rubente. Tourn.* The red imperial Plum, sometimes called the red Bonum Magnum. This is a large oval-shaped fruit, of a deep red colour, covered with a fine bloom. The flesh is very dry, and very indifferent to be eaten raw, but is excellent for making sweatmeats: this is a great bearer. It ripens the beginning of September.

11. PRUNUS *fructu ovato magno flavescente. Tourn.* White imperial, Bonum Magnum, white Holland, or Mogul Plum. This is a large oval-shaped fruit, of a yellowish colour, powdered over with a white bloom. The flesh is firm, and adheres closely to the stone; the juice is of an acid taste, which renders it unpleasant to be eaten raw, but it is very good for baking or sweatmeats. It is a great bearer, and is ripe the middle of September.

12. PRUNUS *fructu ovato cæruleo.* The Cheston Plum. This is a middle-sized fruit, of an oval figure. The outside is of a dark blue, powdered over with a Violet bloom; the juice is rich, and it is a great bearer. Ripe the middle of September.

13. PRUNUS *fructu maximo rotundo flavo & dulci. Tourn.* Prune d'Abricot, *i. e.* the Apricot Plum. This is a large round fruit, of a yellow colour on the outside, powdered over with a white bloom. The flesh is firm and dry, of a sweet taste, and comes clean from the stone. This ripens the end of September.

14. PRUNUS *fructu subrotundo, ex rubro & flavo mixto.* The Maître Claude. Although this name is applied to this fruit, yet it is not what the French so call. This is a middle-sized fruit, rather round than long, of a fine mixed colour, between red and yellow. The flesh is firm, parts from the stone, and has a delicate flavour. Ripe the middle of September.

15. PRUNUS *fructu rubente dulcissimo.* La Rochecourbon, or Diaprée rouge, *i. e.* the red Diaper Plum. This is a large round fruit, of a reddish colour, powdered over with a Violet bloom; the flesh adheres closely to the stone, and is of a very high flavour. Ripe the middle of September.

16. PRUNUS *fructu rotundo flavescente.* La petite Reine Claude, *i. e.* the little Queen Claudia. This is a small round fruit, of a whitish yellowish colour, powdered over with a pearl-coloured bloom; the flesh is firm and thick, quits the stone, and its juice is richly sugared. Ripe the middle of September.

17. PRUNUS *fructu rotundo nigro-purpureo majori dulci. Tourn.* Myrobalan Plum. This is a middle-sized fruit, of a round shape; the outside is a dark purple, powdered over with a Violet bloom; the juice is very sweet. It is ripe the beginning of September.

18. PRUNUS *fructu rotundo è viridi flavescente, carne durâ suavissima.* La grosse Reine Claude, *i. e.* the large Queen Claudia

Claudia, by some the Dauphiny. At *Tours* it is called the Abricot verd, *i. e.* green Apricot; at *Rouen*, Le verte bonne, *i. e.* the good Green; and in other places, Damas verd, *i. e.* green Damask, or Trompvalet, the Servants Cheat. This is one of the best Plums in *England*; it is of a middle size, round, and of a yellowish green colour on the outside; the flesh is firm, of a deep green colour, and parts from the stone; the juice has an exceeding rich flavour, and it is a great bearer. Ripe the middle of *September*. This Plum is confounded by most people in *England*, by the name of Green Gage; but this is the sort which should be chosen, although there are three or four different sorts of Plums generally sold for it, one of which is small, round, and dry; this quits the stone, and is sooner ripe, so not worth planting.

19. PRUNUS fructu amygdalino. *Tourn.* Rognon de Coq, *i. e.* Cock's Testicles. This is an oblong fruit, deeply furrowed in the middle, so as to resemble the testicles; it is of a whitish colour on the outside, streaked with red; the flesh of it adheres firmly to the stone, and it is late ripe.

20. PRUNUS fructu rotundo flavo dulcissimo. *Drap d'Or*, *i. e.* the Cloth of Gold Plum. This is a middle-sized fruit, of a bright yellow colour, spotted or streaked with red on the outside; the flesh is yellow, and full of an excellent juice. It is a plentiful bearer, and ripens about the middle of *September*.

21. PRUNUS fructu cerei coloris. *Tourn.* Prune de Sainte Catharine, *i. e.* St. Catharine Plum. This is an oval-shaped fruit, somewhat flat; the outside is of an Amber colour, powdered over with a whitish bloom, but the flesh is of a bright yellow colour, is dry and firm, adheres closely to the stone, and has a very agreeable sweet taste. This ripens at the end of *September*, and is very subject to dry upon the tree, when the autumn proves warm and dry. This makes fine sweatmeats, and is a plentiful bearer.

22. PRUNUS fructu ovato rubente dulci. The Royal Plum. This is a large fruit, of an oval shape, drawing to a point next the stalk; the outside is of a light red colour, powdered over with a whitish bloom; the flesh adheres to the stone, and has a fine sugary juice. This ripens the middle of *September*.

23. PRUNUS fructu parvo ex viridi flavescente. *Tourn.* La Mirabelle. This is a small round fruit, yellow on the outside; the flesh parts from the stone, is of a bright yellow colour, and has a fine sugary juice. This is a great bearer, ripens the end of *August*, and is excellent for sweatmeats.

24. PRUNUS Brignoniensis, fructu suavissimo. *Tourn.* Prune de Brignole, *i. e.* the Brignole Plum. This is a large oval-shaped fruit, of a yellowish colour, mixed with red on the outside; the flesh is of a bright yellow colour, is dry, and of an excellent rich flavour. This ripens the middle of *September*, and is esteemed the best Plum for sweatmeats yet known.

25. PRUNUS fructu magno è violaceo rubente serotino. *Tourn.* Imperatrice, *i. e.* the Empress. This is a middle-sized oval fruit, of a Violet colour, very much powdered with a whitish bloom; the flesh is yellow, cleaves to the stone, and is of an agreeable flavour. This ripens about the beginning of *October*.

26. PRUNUS fructu ovato maximo flavo. *Tourn.* Prune de Monsieur, *i. e.* Monsieur's Plum. This is sometimes called the *Wentworth* Plum. It is a large oval-shaped fruit, of a yellow colour, both within and without, very much resembling the *Bonum Magnum*, but the flesh of this parts from the stone, which the other doth not. This ripens towards the latter end of *September*, and is very good to preserve, but the juice is too sharp to be eaten raw. It is a great bearer.

27. PRUNUS fructu majori rotundo rubro. *Tourn.* Prune

Cerizette, *i. e.* the Cherry Plum. This fruit is commonly about the size of the Ox-heart Cherry, is round, and of a red colour; the stalk is long, like that of a Cherry, which this fruit so much resembles, as not to be distinguished therefrom at some distance. The blossoms of this tree come out very early in the spring, and being tender, are very often destroyed by cold, but it affords a very agreeable prospect in the spring; for as these trees are generally covered with flowers, which open about the same time as the Almonds, so when they are intermixed therewith, they make a beautiful appearance before many other sorts put out, but by blossoming so early, there are few years that they have much fruit.

28. PRUNUS fructu albo oblongiusculo acido. *Tourn.* The white Pear Plum. This is a good fruit for preserving, but is very unpleasant if eaten raw; it is very late ripe, and seldom planted in gardens, unless for stocks to bud some tender sorts of Peaches upon, for which purpose it is esteemed the best amongst all the sorts of Plums.

29. PRUNUS Mytellinum. *Park.* The Muscle Plum. This is an oblong flat Plum, of a blue colour; the stone is large, and the flesh but very thin, and not well tasted, so that its chief use is for stocks, as the former.

30. PRUNUS fructu parvo violaceo. The St. Julian Plum. This is a small fruit, of a dark Violet colour, powdered over with a mealy bloom; the flesh adheres closely to the stone, and in a fine autumn will dry upon the tree. The chief use of this Plum is for stocks, to bud the more generous kinds of Plums and Peaches upon, as also for the *Bruxelles* Apricot, which will not thrive so well upon any other stock.

31. PRUNUS sylvestris major. *J. B.* The black Bullace-tree. This grows wild in the hedges in divers parts of *England*, and is rarely cultivated in gardens.

32. PRUNUS sylvestris, fructu majore albo. *Raii Syn.* The white Bullace-tree. This grows wild as the former, and is seldom cultivated in gardens.

33. PRUNUS sylvestris. *Ger. Emac.* The Black-thorn, or Sloe-tree. This is very common in the hedges almost every where. The chief use of this tree is to plant for hedges, as White-thorn, &c. and being of quick growth, is very proper for that purpose.

All the varieties of Plums are propagated by budding or grafting them upon stocks of the Muscle, white Pear, St. Julian, Bonum Magnum, or any other sorts of free-shooting Plums. The manner of raising these stocks hath been already exhibited under the article of NURSERIES, therefore need not be repeated again in this place; but I would observe, that budding is much preferable to grafting for these sorts of fruit-trees, because they are very apt to gum, wherever there are large wounds made on them.

The trees should not be more than one year's growth from the bud when they are transplanted, for if they are older, they seldom succeed so well, being very subject to canker; or if they take well to the ground, commonly produce only two or three luxuriant branches, therefore it is much more advisable to choose young plants.

The manner of preparing the ground (if for walls) is the same as for Peaches; as is also the pruning the roots and planting, therefore I shall forbear repeating it again. The distance which these trees should be planted at, must not be less than twenty-four feet against high walls, and if the wall is low, they should be placed thirty feet asunder.

Plums should have a middling soil, neither too wet and heavy, nor over-light and dry, in either of which extremes they seldom do so well; those sorts which are planted against walls, should be placed to an east or south-east aspect, which is more kindly to these fruits than a full south aspect, on which they are subject to shrivel, and be very dry;

dry; and many sorts will be extreme mealy, if exposed too much to the heat of the sun, and most of the sorts will ripen extremely well on espaliers, if rightly managed.

There are some persons who plant Plums for standards, in which method several of the ordinary sorts will bear very well; but the fruit will not be near so fair as those produced on espaliers, and will be more in danger of being bruised or blown down by strong winds. The distance of placing them for espaliers, must be the same as against walls, as must also their pruning and management; so that whatever may be hereafter mentioned for one, should be likewise understood for both.

Plants do not only produce their fruit upon the last year's wood; but also upon cursons or spurs, which come out of wood that is many years old; so that there is not a necessity of shortening the branches, in order to obtain new shoots annually, in every part of the tree (as in Peaches, Nectarines, &c. hath been directed), since the more these trees are pruned, the more luxuriant they grow, until the strength of them is exhausted, and then they gum and spoil; therefore the safest method to manage these trees is, to lay in their shoots horizontally, annually, as they are produced, at equal distances, in proportion to the length of their leaves; and where there is not a sufficient quantity of branches to fill up the vacancies of the tree, there the shoots may be pinched the beginning of *May* (in the manner as hath been directed for Peaches, &c.) which will cause them to produce some lateral branches to supply those places; and during the growing season, all fore-right shoots should be displaced, and such as are to remain must be regularly trained to the wall or espalier, which will not only render them beautiful, but also give to each an equal advantage of sun and air; and hereby the fruit will be always kept in a growing state, which they seldom are, when overshaded with shoots some part of the season, and then suddenly exposed to the air, by the taking off or training those branches in their proper position.

With thus carefully going over these trees in the growing season, there will be but little occasion for cutting them in winter, which (as I before have said) is of ill consequence to all sorts of stone-fruit; for when the branches are shortened, the fruit is cut away, and the number of shoots increased, because whenever a branch is shortened, there are commonly two or more shoots produced from the eyes immediately below the cut; so that by thus unskillfully pruning, many persons crowd their trees with branches, and thereby render the trees unfruitful, and what little fruit the trees produce, are small and ill tasted.

The few rules here laid down will be sufficient, if due observation be joined therewith, to instruct any person in the right management of these sorts of fruit-trees; therefore I shall not say more on that subject, lest by multiplying instructions, it may render it more obscure to a learner.

PSEUDOACACIA. See Robinia.

PSEUDODICTAMNUS. See Marrubium.

PSIDIUM. *Lin. Gen. Plant.* 541. The Guava.

The Characters are,

The flower has a bell-shaped empalement, divided into five oval points at the top. It hath five oval, concave, spreading petals, indented in the empalement, with a great number of stamina, which are shorter than the petals, and are inserted in the empalement, terminated by small summits. It has a roundish germen, situated under the flower, supporting a long awl-shaped style, crowned by a simple stigma. The germen afterward becomes a large oval fruit, crowned by the empalement, inclosing a great number of small seeds.

The Species are,

1. PSIDIUM ramis angulosis, foliis ovatis venosis, fructu

majori. Psidium with angular branches, oval veined leaves, and a larger fruit; the red Guava.

2. PSIDIUM foliis oblongo-ovatis venosis, fructu parvo odorato. Psidium with oblong oval leaves, which are veined, and a small sweet-scented fruit.

Both these sorts grow naturally in the *East* and *West-Indies*, and there is also a third with a large white fruit, but I do not know whether this is a variety of the common Guava, or of that with the small white fruit; though I am inclined to believe it is the former, because I have raised many plants from the seeds of the small white Guava, which have produced fruit in the *Chelsea* garden, and have not varied from their parent plant.

The common red Guava hath a pretty thick trunk, which rises twenty feet high, covered with a smooth bark; the branches are angular, garnished with oval leaves, having a strong midrib, and many veins running toward the sides, of a light green colour, standing opposite upon very short foot-stalks. From the wings of the leaves the flowers come out upon foot-stalks, about an inch and a half long; they are composed of five large, roundish, concave petals, which are inserted in the empalement, and within these are a great number of stamina, which are shorter than the petals, terminated by small summits; these stamina are also inserted in the empalement. Under the flower is situated a roundish germen, supporting a very long awl-shaped style, crowned by a simple stigma. After the flower is past, the germen becomes a large oval fruit, shaped like a Pomgranate, having one cell, crowned by the empalement of the flower, and filled with small seeds; the fruit, when ripe, has an agreeable odour. They are much eaten in the *West-Indies*, both by men and beasts; and the seeds, which pass whole through the body, and are voided with the excrement in hot countries, grow, whereby the trees are spread over the ground, where they are permitted to grow. This fruit is very astringent, and nearly of the same quality with Pomgranate, so should be avoided by those persons who are subject to be costive.

The large white sort grows naturally in the islands of the *West-Indies*, and is often found intermixed with the former, so is supposed to be only an accidental variety arising from the same seeds. This differs from the former, in the colour of the midrib of the leaves, which in this are pale, but those of the former are red. The flowers and fruit of of this are larger, and the inside of the fruit is white.

The leaves of the small white Guava, are like those of the larger, but the branches of the tree are not so angular; the flowers are much smaller, and the fruit is no larger than a middling Gooseberry, but when ripe has a very strong aromack flavour. This flowers in *June*, and the fruit ripens in autumn.

These plants are propagated by seeds, which when brought over in the entire fruit, gathered full ripe, they will more certainly succeed; these should be sown in pots filled with kitchen-garden earth, and plunged into a hot-bed of tan-bark; in about six weeks the plants will appear (if the seeds are good) when they must have free air admitted to them, in proportion to the warmth of the season; when the plants have obtained strength enough to remove, they should be each planted in a small pot, filled with the like earth, and plunged into a fresh hot-bed, shading them from the sun, until they have taken new root; then they should have a large share of free air admitted to them every day in warm weather, to prevent their drawing up weak; they must also be frequently refreshed with water in summer. In the autumn they must be plunged into the tan-bed in the stove; during the winter they should be kept in a moderate warmth, and not have too much water; in summer they will require plenty of wet, and in hot weather a great

share of air. With this management the plants will produce flowers and fruit the third year, and may be continued a long time.

PSORALEA. *Lin. Gen. Plant.* 801. Barba Jovis.

The Characters are,

The empalement of the flower is cut into five parts, the lower segments being twice the length of the other. The flower is of the butterfly kind; it hath five petals; the standard is roundish, and indented at the top. The wings are small, obtuse, and moon-shaped; the keel is moon-shaped, and composed of two petals. It hath nine stamina joined together, and one bristly stamina standing separate, terminated by roundish summits, with a linear germen, supporting an awl-shaped rising style, crowned by an obtuse stigma. The germen afterward turns to a slender compressed pod, inclosing one kidney-shaped seed.

The Species are,

1. PSORALEA *foliis pinnatis, floribus axillaribus.* *Hort. Upsal.* 225. Pforalea with winged leaves, and flowers proceeding from the sides of the stalks.

2. PSORALEA *foliis simplicibus ovatis.* *Hort. Upsal.* 225. Pforalea with single oval leaves.

3. PSORALEA *foliis ternatis, foliis ovatis, caule fruticoso hirsuto, floribus spicatis terminalibus.* Pforalea with trifoliate oval leaves, a hairy shrubby stalk, and flowers growing in spikes terminating the branches.

4. PSORALEA *foliis pinnatis argenteis, caulibus procumbentibus, floribus axillaribus.* Pforalea with silvery winged leaves, trailing stalks, and flowers proceeding from the sides of the stalks.

5. PSORALEA *foliis pinnatis, caule ramofo scandente, floribus alaribus sessilibus.* Pforalea with winged leaves, a climbing branching stalk, and flowers sitting close at the wings of the stalk.

6. PSORALEA *foliis ternatis, caule fruticoso ramofissimo, floribus capitatis pedunculatis alaribus.* Pforalea with trifoliate leaves, a very branching shrubby stalk, and flowers growing in heads, which have foot-stalks, proceeding from the wings of the leaves.

7. PSORALEA *foliis pinnatis, spicis terminalibus.* *Lin. Sp. Plant.* 764. Pforalea with winged leaves, and flowers growing in spikes terminating the branches.

8. PSORALEA *foliis pinnatis, foliolis rotundioribus villosis, floribus capitatis alaribus terminalibusque, caule fruticoso.* Pforalea with winged leaves, having hairy round lobes, flowers growing in heads from the wings of the leaves, and at the end of the branches, and a shrubby stalk.

9. PSORALEA *foliis ternatis, foliolis ovatis, floribus capitatis, pedunculis longissimis.* Pforalea with trifoliate leaves, having oval lobes, and flowers growing in heads on very long foot-stalks.

10. PSORALEA *foliis ternatis, foliolis ovato-lanceolatis, floribus capitatis pedunculis longioribus.* Pforalea with trifoliate leaves, having oval spear-shaped lobes, and flowers growing in heads upon long foot-stalks.

The first sort grows naturally at the *Cape of Good-Hope*; it rises with a soft shrubby stalk four or five feet high, garnished with deep green winged leaves, composed of three or four pair of very narrow linear lobes, terminated by an odd one, standing upon short foot-stalks. The flowers sit very close to the branches, coming out from the wings of the leaves; they are often in clusters. The standard, which is erect and reflexed at the top, is of a fine blue; the wings are pale, and the keel white; these flowers are succeeded by short pods the length of the empalement, each containing one kidney-shaped seed. It flowers great part of summer, and the seeds ripen in autumn. This is easily propagated by seeds, which should be sown upon a moderate hot-bed; and when the plants come up, they must

not be drawn weak, so they should have air and but little heat. When they are fit to remove, they should be planted in separate small pots, filled with light earth, and plunged again into the bed, shading them from the sun till they have taken new root; then they should be gradually inured to the open air, into which they should be removed about the end of *May*, and kept abroad till *October*; then they must be placed in the green-house, and treated in the same way as other plants from the same country.

The second sort grows naturally in *India*. This is an annual plant; the stalks rise a foot and a half high, and are garnished at each joint by one oval leaf. The flowers stand upon long slender foot-stalks, which come out at the wings of the leaves, collected into small round heads, and are of a pale flesh colour. It flowers in *July*, and the seeds ripen in autumn. This is propagated by seeds, which must be sown upon a hot-bed in the spring; and when the plants are fit to remove, they should be planted into separate small pots filled with light earth, and plunged into a moderate hot-bed, shading them from the sun till they have taken new root; after which they must have free air admitted to them in warm weather. When the plants have filled the pots with their roots, they should be removed into larger, and the beginning of *July* they may be removed into an airy glass-case, where they may be defended from cold, but should have free air in warm weather; with this care the plants will flower and ripen their seeds.

The third sort was discovered by the late *Dr. Houstoun* at *La Vera Cruz*. This rises with a shrubby stalk three or four feet high, sending out a few side branches, garnished with oval, trifoliate, hairy leaves, standing upon slender foot-stalks. The flowers are collected in spikes at the end of the branches; they are of a purple colour, and are succeeded by short pods, each containing one kidney-shaped seed. It is propagated by seeds, which must be sown upon a hot-bed, and the plants afterward treated in the same way as the second sort; but as this is an abiding plant, so they must be removed into the stove in autumn, and kept in a moderate warmth in winter; and in summer they must have a large share of air, but should constantly remain in the stove; the second year they will produce flowers, and sometimes their seeds will ripen in *England*.

The seeds of the fourth sort came from *Malabar*. This is an annual plant, with trailing stalks, garnished with silvery leaves, composed of three or four pair of narrow lobes, terminated by an odd one. The flowers grow in small clusters at the wings of the leaves; they are small; and of a purple colour; the seed-pods are short, and have one small kidney-shaped seed in each. This is propagated by seeds, in the same manner as the second sort.

The fifth sort was discovered by the late *Dr. Houstoun* at *Campeachy*, where it grows naturally. This hath slender, shrubby, climbing stalks, which twine about any neighbouring support; and rise to the height of six or seven feet, garnished with winged leaves, composed of three pair of small, oval, obtuse lobes, terminated by an odd one. The flowers come out in small clusters from the wings of the leaves; they are small, of a bright blue colour, and are succeeded by short pods, including one kidney-shaped seed.

The sixth sort was discovered by the same gentleman, growing naturally at *Campeachy*. This rises with a shrubby stalk seven or eight feet high, sending out many long slender branches on every side, garnished with trifoliate leaves, whose lobes are small and wedge-shaped. The flowers are produced from the wings of the leaves in close small heads, standing upon pretty long foot-stalks; they are blue, and are succeeded by short pods, each containing a single kidney-shaped seed.

These two sorts are propagated by seeds, which must be sown upon a hot-bed, and when the plants come up, they must be treated in the same way as the third sort.

The seventh sort was discovered by the late Dr. *Houfoun* at *La Vera Cruz*. This is an annual plant, with a very branching herbaceous stalk, rising a foot and a half high, garnished with winged leaves, composed of five or six pair of narrow wedge-shaped lobes, terminated by an odd one. The flowers are collected in close oblong spikes, terminating the branches; they are small, of a bright blue colour, and are succeeded by short pods, each containing a single kidney-shaped seed. This is propagated by seeds, and requires the same treatment as the second sort.

The eighth sort grows naturally at *La Vera Cruz*, from whence the late Dr. *Houfoun* sent the seeds. This hath an upright shrubby stalk, which rises five or six feet high, having a few side branches, closely garnished with winged leaves, composed of three or four pair of small roundish hairy lobes, terminated by an odd one. The flowers are collected in small heads, coming out from the wings of the leaves, and at the end of the branches; they are yellow and red intermixed, and are succeeded by short pods, containing one kidney-shaped seed. This sort requires the same treatment as the third.

The ninth sort grows naturally in the south of *France* and *Italy*. The root of this is perennial, but the stalk is not of long duration, seldom lasting more than two years; it rises about two feet high, sending out two or three slender branches, garnished with trifoliate leaves, whose lobes are oval, standing upon long foot-stalks; these, if handled, emit a strong scent of bitumen. The flowers are collected in heads, and have foot-stalks seven or eight inches long; they are blue, and are succeeded by short pods, containing one seed.

The tenth sort grows naturally in *Sicily*, and also in *Jamaica*, from both which countries I have received the seeds. This hath been supposed to be the same with the former, but I have many years propagated both by seeds, and have never found either of them vary. The leaves of this are much longer and narrower than those of the former sort, and are rounded at their base; the stalks are shrubby, and of long duration; the heads of flowers are smaller, and the leaves have not so strong an odour. These are propagated by seeds, which should be sown on a bed of light earth in *April*, and in *May* the plants will come up, when they should be kept clean from weeds, and as soon as they are fit to remove, they should be transplanted. Those of the ninth sort will live through the winter in the open air, if they are planted in a warm dry border; but the tenth sort requires some shelter in winter, so these should be planted in pots, and put into a common frame in winter, where they may be screened from hard frost. These plants flower from *June* to autumn, and perfect their seeds annually.

PSYLLIUM. See *Plantago*.

PTARMICA. See *Achillea*.

PTELEA. *Lin. Gen. Plant.* 141. Shrub Trefoil.

The Characters are,

The empalement of the flower is cut in four acute parts. The flower has four oval spear-shaped petals; it hath four awl-shaped stamina, terminated by roundish summits, and an orbicular compressed germen, supporting a short style, crowned by two obtuse stigmas. The germen afterward becomes a roundish membranaceous capsule with two cells, each containing one obtuse seed.

The Species are,

1. PTELEA *foliis ternatis*. *Lin. Sp. Plant.* 118. Ptelea with trifoliate leaves; commonly called *Carolina Shrub Trefoil*.

2. PTELEA *foliis simplicibus*. *Lin. Sp. Plant.* 118. Ptelea with single leaves.

The first sort grows naturally in *North America*. It was first discovered in *Virginia* by Mr. *Banister*, who sent the seeds to *England*, from which some plants were raised at *Fulham*, and other curious gardens, but being planted in the open air, they were destroyed by a severe winter, so that there were scarce any of the plants left in *England*; but in 1724, Mr. *Catesby* sent over a good quantity of the seeds from *Carolina*, which succeeded so well, as to furnish many gardens with the plants. This rises with an upright woody stem twelve or fourteen feet high, dividing into many branches, covered with a smooth grayish bark, garnished with trifoliate leaves, standing upon long foot-stalks. The lobes are oval, spear-shaped, smooth, and of a bright green on their upper side, but pale on their under; these come out late in the spring, and at the same time the bunches of flower-buds appear, which is generally in the beginning of *June*, the leaves being then but small, and afterward increase in their size, but are not fully grown till the flowers decay. The flowers are produced in large bunches at the end of the branches; they are of an herbaceous white colour, composed of four or five short petals, ending in acute points, fastened at their base to a short empalement, cut into four segments almost to the bottom. In the center is situated an orbicular compressed germen, supporting a short style, which is attended by four awl-shaped stamina; the germen afterward turns to a capsule, surrounded by a leafy border, having two cells, each containing one seed.

These shrubs may be propagated by cuttings, which should be planted in pots, and plunged into a moderate hot-bed. The best time for planting them is in the beginning of *March*; but they must be carefully managed, so as not to have too much heat, and shaded from the sun in the middle of the day, otherwise they will not succeed. They may also be propagated by layers, but these are often two years before they take root; but if good seeds can be procured either here or from abroad, the plants raised from those will be much stronger, than those which are propagated by either of the former methods.

The seeds may be sown in the beginning of *April*, on a bed of light earth, in a warm sheltered situation, where, if the ground is moistened in dry weather, the plants will come up in two months; but if the seeds are sown in pots, and placed on a very moderate hot-bed, the plants will come up sooner, and make greater progress the first year, but they must not be forced or drawn, for that will make them very tender; therefore in *June* the plants should be exposed to the open air, in a sheltered situation, where they may remain till the frost comes on; when those in the pots should be either placed under a common frame, to shelter them from severe frost, or the pots plunged into the ground, near a hedge, that the frost may be prevented from penetrating through the sides of the pots to the roots of the plants. The following spring the plants may be planted into a nursery-bed, at about one foot distance, where they may grow two years, by which time they will be fit to transplant where they are designed to remain.

These plants are a little tender while they are young, therefore will require some protection the first and second years, but particularly from the early frosts in autumn, which frequently kill the tops of the tender shoots before they are hardened; and the more vigorous the plants have grown the preceding summer, the greater danger there is of their being killed, therefore they should be screened either with mats, or some other covering; but as they advance in strength, they become more hardy, and are rarely injured by frost.

The second sort grows naturally in both *Indies*. It is very common in most of the islands in the *West-Indies*. This sends up several stalks from the root, about the size of a man's

man's arm, sending out several upright branches, covered with a light brown bark, which frequently separates from the wood, and hangs loose; they are garnished with stiff leaves, which vary greatly in their shape and size; they are spear-shaped, entire, and of a light green, growing with their points upward, and have very short foot-stalks. The flowers are produced at the end of the branches in a sort of racemus, each standing upon a slender foot-stalk; they have four solid channelled petals, of an herbaceous colour, having four stamina, which spread open, and in the center is situated a roundish compressed germen, which afterward turns to a compressed capsule with three cells, surrounded by a broad leafy border, each cell containing one or two roundish seeds.

This plant is propagated by seeds, which, if obtained fresh from abroad, will rise easily upon a hot-bed; when the plants are fit to remove, they should be each planted in a separate small pot, filled with light loamy earth, and plunged into a hot-bed of tanners bark, shading them from the sun till they have taken new root; then they should have free air admitted to them every day, in proportion to the warmth of the season, for they must not be drawn up weak, nor should they have too much water. In the autumn, the plants must be removed into the stove, where they should have a temperate warmth in winter, but during that season little water should be given them; nor should they have too much heat, for either of these will soon destroy them: as the plants obtain strength, so they will become more hardy, and may be set abroad in the open air for two or three months in the heat of summer, but it should be in a sheltered situation; in the winter they must be placed in a stove, kept to a moderate temperature of warmth, for the plants will not live in a green-house here.

This was formerly shewn for the Tea-tree in many of the European gardens, where it many years passed for it among those who knew no better.

PULEGIUM. *Raii Meth. Plant.* 61. Pennyroyal, or Pudden-grafs.

The Characters are,

The empalement of the flower is permanent, cut into five parts. The flower is of the lip kind; it hath one petal, with a short tube, divided at the brim into four parts; the helmet or upper lip of the flower, is entire; the lower is cut into three equal segments. It hath four stamina, two being longer than the other, terminated by roundish summits, and a four-pointed germen, supporting an erect style, crowned by a bifid stigma. The germen afterward becomes four small seeds, sitting in the empalement of the flower.

The Species are,

1. **PULEGIUM** *foliis ovatis obtusis, staminibus corollam æquantibus, caule repente.* Pennyroyal with oval obtuse leaves, stamina equalling the petal, and a creeping stalk; common or broad-leaved Pennyroyal.

2. **PULEGIUM** *foliis lanceolatis, staminibus corollâ longioribus, caule erecto.* Pennyroyal with spear-shaped leaves, stamina longer than the petal, and an upright stalk.

3. **PULEGIUM** *foliis linearibus, floribus verticillatis terminalibusque.* Pennyroyal with linear leaves, and flowers growing in whorls at the ends of the stalks; narrow-leaved Pennyroyal.

The first sort grows naturally upon moist commons, where the water stands in winter, in many parts of England. The root is fibrous and perennial; the stalks are smooth, and trail upon the ground, putting out roots at every joint, whereby it spreads and propagates very fast; the stalks are garnished at each joint by two oval leaves, which are for the most part entire. The flowers grow toward the upper part of the branches, coming out just above the leaves at each joint in whorls; they are of a pale pur-

ple colour, small and galeated, the helmet being entire; whereas in the Mint, this is indented at the point. The stamina of the flowers are of the same length with the petal, but the style is somewhat longer; the whole plant has a very strong smell, and a hot aromack taste. There is a distilled water of this plant, and also an oil, which is kept in the shops for medicinal use. There is a variety of this with a white flower, which is sometimes found growing naturally in England.

The seeds of the second sort were sent me from *Gibraltar*, which succeeded in the *Chelsea* garden, but had been before introduced into several gardens, where it had been cultivated to supply the markets. The stalks of this grow erect, and near a foot high; the leaves are longer and narrower than those of the common sort; the whorls of flowers are much larger, and their stamina are longer than the petals. This sort hath almost superseded the first in the markets, for as the stalks grow erect, so it is much easier to cut and tie in bunches than the common sort; it also comes earlier to flower, and has a brighter appearance, but whether it is as good for use, I shall leave to be determined by those whose province it belongs to.

The third sort grows naturally in the south of *France* and *Italy*; it is called *Hart's Pennyroyal*. This is by some preferred to the common sort for medicinal use; the stalks of this grow erect, near two feet high, sending out side branches all their length; the leaves are very narrow, and of a thicker substance than those of the common sort; the whorls of flowers are rather larger; the scent is not quite so strong as that of the first sort, and the stalks are frequently terminated by whorls of flowers. This is cultivated in gardens here, and flowers about the same time as the common sort. There is a variety of this with white flowers, which grows taller than that with purple flowers, but I do not believe it is a different sort.

All these plants propagate themselves very fast by their branches trailing upon the ground, which emit roots at every joint, and fasten themselves into the earth, and send forth new branches; so that no more is required in their culture, than to cut off any of these rooted branches, and plant them out in fresh beds, allowing them at least a foot from plant to plant every way, that they may have room to grow; or the young shoots of these planted in the spring, will take root like Mint.

The best time for this work is in *September*, that the plants may be rooted before winter; for if the old roots are permitted to remain so close together, as they generally grow in the compass of a year, they are subject to rot in winter; besides, the young plants will be much stronger, and produce a larger crop the succeeding summer, than if they were removed in the spring. These plants all love a moist strong soil, in which they will flourish exceedingly.

PULMONARIA. *Tourn. Inst. R. H.* 136. tab. 55. Lungwort.

The Characters are,

The flower hath a cylindrical permanent empalement, cut into five parts at the top. The flower is of one petal, having a cylindrical tube, cut at the top into five parts, which spread open, but the chaps are pervious. It hath five short stamina, terminated by erect summits, which close together, and four germen, supporting a short style, crowned by an obtuse indented stigma. The germen afterward turns to four roundish seeds, sitting in the bottom of the empalement.

The Species are,

1. **PULMONARIA** *foliis radicalibus ovato-cordatis scabris.* *Hort. Cliff.* 44. Lungwort, whose lower leaves are oval, heart-shaped, and rough; common spotted Lungwort, or *Jerusalem Cowslip*.

2. *PULMONARIA foliis caulinis ovatis glabris, floribus patulis, segmentis obtusifusculis.* Lungwort with oval smooth leaves to the stalks, spreading flowers, and obtuse segments.

3. *PULMONARIA foliis lanceolatis basi semiamplexicaulibus, calycibus abbreviatis.* Lungwort with spear-shaped leaves, whose base half embraces the stalk, and the empalement shorter than the tube of the flower.

4. *PULMONARIA foliis radicalibus lanceolatis.* Hort. Cliff. Lungwort with the lower leaves spear-shaped.

5. *PULMONARIA caulibus procumbentibus, floribus singularibus alaribus, calycibus inflatis corollâ longioribus.* Lungwort with trailing stalks, flowers growing singly from the sides, and swollen empalements, which are longer than the petal.

6. *PULMONARIA calycibus abbreviatis, foliis lanceolatis obtusifusculis.* Lin. Sp. Plant. 135. Lungwort with short empalements to the flowers, and spear-shaped obtuse leaves.

The first sort grows naturally in woods and shady places, in *Italy* and *Germany*, and is cultivated in the *English* gardens chiefly for medicinal use. It hath a perennial fibrous root; the lower leaves are rough, of an oval heart-shape, of a dark green on their upper side, marked with many broad whitish spots, but pale and unspotted on their under; the stalks rise almost a foot high, having several smaller leaves on them, standing alternately. The flowers are produced in small bunches on the top of the stalks, each having a tubulous hairy empalement, as long as the tube of the flower; the brims of the petal are spread open above them, which are shaped like a cup; these are red, purple, and blue, in the same bunch, and are succeeded by four naked seeds, which ripen in the empalement. It is accounted a pectoral balsamick plant, and good for coughs and consumptions, spitting of blood, and the like disorders of the lungs; it is likewise put into wound-drinks.

The second sort grows naturally on the *Alps*. This hath a perennial fibrous root; the leaves are large, smooth, and spotted on their upper side; the stalks rise nine inches high, garnished with oval leaves, whose base join the stalks. The flowers grow in small bunches on the top of the stalk; they are purple, and spread open wider than those of the common sort.

The third sort grows naturally upon the *Helvetian* mountains. It is a perennial plant, whose leaves are large, spear-shaped, and rough. The foot-stalks of the lower leaves are broad; the stalks rise a foot high, garnished with spear-shaped leaves, whose base half embrace the stalks; they are greatly spotted with white, appearing as if they were incrustated with sugar-candy; the flowers grow in large bunches on the top of the stalk; their tubes are longer than the empalement, and their brims are spread more than those of the common sort. They are of a bright blue.

The fourth sort grows naturally in *Austria* and *Hungary*. This hath leaves much narrower than those of the common sort, covered with soft hairs. The stalks rise a foot high, garnished with narrow leaves, of the same shape with those below, but smaller; these almost embrace the stalk with their base. The flowers are produced in bunches on the top of the stalks like the others; they are of a red colour before they expand, but, when they are fully blown, of a most beautiful blue colour.

The fifth sort was discovered in the *Archipelago* by Dr. *Tournefort*. This is an annual plant. The lower leaves are oblong and hairy; the stalks trail upon the ground, and are garnished with oblong hairy leaves, sitting close to the stalks; just above each leaf comes a single flower of a sullen purple colour, funnel shaped, the brims not spreading; the empalement is swollen like an inflated bladder, and covers the petal of the flower, so as not to be seen without a near inspection; after the flowers are past, the four seeds ripen in the empalement.

The sixth sort grows naturally upon mountains in most parts of *North America*. The seeds of this plant were sent many years since by Mr. *Banister* from *Virginia*, and some of the plants were raised in the gardens of the bishop of *London* at *Fulham*, where for several years it was growing. This hath a thick, fleshy, perennial root, sending out many small fibres. The stalks rise a foot and a half high; the leaves, which are near the root, are long, smooth, obtuse, and of a light green, having short foot-stalks; those upon the stalk diminish in their size upward, but are of the same shape, and sit close to the stalk. Each of the small branches is terminated by a cluster of flowers, whose empalements are very short, and are cut into five segments almost to the bottom; the tube of the flower is long, and at the top spreads open in shape of a funnel, the brim being entire, but appears five-cornered from the folding of the petal. The most common colour of these flowers is blue, but there are some purple, others red, and some white. The leaves and stalks entirely decay in *August*, and the roots remain naked till the following spring.

There are some other species of this genus, which are preserved in botannick gardens for the sake of variety, but, having little beauty, they are seldom cultivated in other places.

The first, second, third, fifth, and sixth sorts have perennial roots, so may be cultivated by parting of their roots, which is best done in the autumn, that the plants may be well rooted before the dry weather comes on in the spring, which will cause them to flower much stronger.

The soil in which they are planted should not be rich, but rather a fresh light sandy ground, in which they will thrive much better. They should have a shady situation, and the first and third sorts thrive best in a moist soil, for in a hot dry soil they burn and decay in summer, unless they are duly watered in dry weather. The sixth sort should not have a soil too moist, for as the roots run deep in the ground, they will be in danger of rotting by much wet.

The other sort is annual, so is propagated by seeds. The best time to sow these is in autumn, soon after they are ripe, for the plants will resist the cold of our winters very well, and will flower early the following summer, so good seeds may be obtained; whereas, those which are sown in the spring sometimes miscarry, or lie a year in the ground. These seeds should be sown where they are designed to remain, for the plants do not succeed very well, when they are transplanted. When the plants come up, they require no other culture, but to keep them clear from weeds, and, where they are too close, to thin them. If these plants are permitted to scatter their seeds, they will come up better than when they are sown.

PULSATILLA. Tourn. Inst. R. H. 234. tab. 148. Pasque-flower.

The Characters are,

The flower hath a leafy involucre, ending in many points; it hath two orders of petals, three in each, and a great number of slender stamina, about half the length of the petals, terminated by erect twin summits, and a great number of germen collected in a head. The germen afterward becomes so many seeds, having long hairy tales sitting upon the oblong receptacle.

The Species are,

1. *PULSATILLA foliis decompositis pinnatis, flore nutante, limbo erecto.* Hort. Cliff. 223. Pasque flower with decomposed winged leaves, and a nodding flower, having an erect rim.

2. *PULSATILLA foliis decompositis pinnatis, flore pendulo, limbo reflexo.* Hort. Cliff. 223. Pasque flower with decomposed winged leaves, and a pendulous flower, whose border is reflexed.

3. *PULSATILLA foliis simpliciter pinnatis, foliolis lobatis, flore erecto. Flor. Suec. 448.* Pasque-flower with simple winged leaves, whose wings have lobes, and an erect flower.

4. *PULSATILLA foliis digitatis multifidis, flore erecto patente.* Pasque-flower with hand-shaped leaves, having many points, and an erect spreading flower.

The first of these plants is common in divers parts of *England*; it grows in great plenty on *Gogmagog* hills on the left-hand of the highway leading from *Cambridge* to *Haveril*, just on the top of the hill; also about *Hildersham*, six miles from *Cambridge*, and on *Bernack Heath* not far from *Stamford*, and an *Southrop Common* adjoining thereto; also on mountains and dry pastures just by *Leadstone Hall* near *Pentefract* in *Yorkshire*.

This hath a fleshy taper root, which runs deep in the ground; the leaves are hairy, and finely cut, like those of the wild Carrot; the stalk rises a foot high, is pretty thick, hairy, and naked to the top, where there is a leafy involucre to the flower, which is hairy, ending in many points; it is terminated by one flower, composed of six petals, ranged in two orders, three without, and three within; they are oblong, thick, and of a purple colour, bell-shaped, nodding on one side, and their points turn upward. Within the petals are a great number of slender yellowish stamina, terminated by erect summits, and in the center a great number of germen are collected in a head, which afterward become seeds, each having a long tail, by which they are distinguished from *Anemone*.

There is a variety of this with double flowers, and another with white, but these have been obtained from seeds of the other.

The second sort hath shorter leaves than the first; the stalks do not rise so high; the flowers do not expand so wide, and hang downward, but their brims are reflexed; they are of a very dark purple colour. This grows naturally in the meadows in *Germany*.

The third sort grows naturally on the *Alps* and *Helvetian* mountains; this hath a perennial root. The leaves are like those of *Smallage*, and are simply winged; the stalk rises near a foot high, is naked almost to the top, where comes out a neat hairy involucre, and above that one yellow flower, shaped like the perennial yellow *Adonis* standing erect.

The fourth sort grows in *Siberia*; it hath a thick fleshy root, which sends out many strong fibres. The leaves are hand-shaped, composed of several roundish lobes, like some of the sorts of *Ranunculi*; they are downy, and cut into several segments. The stalk rises nine or ten inches high, having a hairy involucre a considerable distance below the flower; it is terminated by one flower, which is large, spreading, and of a whitish yellow colour, with deep yellow stamina.

There are some other species of this plant, but those here mentioned are all the sorts which I have seen growing in *England*, and therefore I have not enumerated more, as it would be to little purpose, since it is difficult to procure them from the countries where they naturally grow.

These plants may be propagated by seeds, which should be sown in boxes or pots filled with very light sandy earth, observing not to cover the seeds too deep with mould, which will prevent their rising, for they require no more than just to be covered. These boxes should be placed where they may have the morning sun until ten of the clock, but must be screened from it in the heat of the day, and, if the season proves dry, the earth should be often refreshed with water. The best time for sowing of these seeds is in *July*, soon after they are ripe, for if they are kept till spring, they seldom grow.

The boxes or pots, in which the seeds are sown, should remain in this shady situation until the beginning of *October*, when they should be moved where they may enjoy the full sun during the winter season. About the beginning of *March* the plants will begin to appear, at which time the boxes should be again removed, where they may have only the forenoon sun; for if they are too much exposed to the heat, the young plants will die away. They should also be refreshed with water in dry weather, which will greatly promote their growth, and they must be carefully kept clean from weeds, which, if suffered to grow among them, will in a short time destroy them.

When the leaves of these plants are entirely decayed (which is commonly in *July*), you should then take up the roots, which, being nearly of the colour of the ground, will be difficult to find while small; therefore you should pass the earth through a fine wire-sieve, which is the best method to separate the roots from the earth (but notwithstanding all possible care taken, yet there will be many small roots left; so that the earth should either be put into the boxes again, or spread upon a bed of light earth, to see what plants will arise out of it the succeeding year). The roots, being taken up, should be immediately planted again in beds of fresh loamy earth, about three or four inches asunder, covering them about three inches thick with the same earth. The spring following most of these plants will produce flowers, but they will not be so large and fair as in the succeeding years, when the roots are larger.

The roots of these plants generally run down deep in the ground, and are of a fleshy substance, somewhat like Carrots, so will not bear to be kept long out of the ground; therefore, when they are removed, it should be done in autumn, that they may take fresh root before the frost comes on, for if they are transplanted in the spring, they will not produce strong flowers. These plants thrive best in a loamy soil, for in very light dry ground they are apt to decay in summer.

PUMPKION. See Pepo.

PUNICA. *Tourn. Inst. R. H. 633. tab. 407.* The Pomgranate-tree.

The Characters are,

The empalement of the flower is bell-shaped, coloured, and cut into six parts at the top. The flower has five roundish, erect, spreading petals, which are inserted in the empalement, and a great number of slender stamina, which are also inserted in the empalement, terminated by oblong summits. The germen is situated under the flower, supporting a single style, crowned by a beaded stigma; it afterward becomes a large almost globular fruit, crowned by the empalement. The fruit is divided into several cells by membranous partitions, which are filled with roundish succulent seeds.

The Species are,

1. *PUNICA foliis linearilanceolatis, caule arborecente, flore majore.* Pomgranate with linear spear-shaped leaves, a tree-like stalk, and a larger flower.

2. *PUNICA foliis linearibus, caule frutescente, flore minore.* Pomgranate with linear leaves, a shrubby stalk, and a smaller flower; dwarf Pomgranate.

There are the following varieties of the first sort, which are supposed to be accidentally obtained by culture from the seeds, therefore I have not enumerated them as species; but as many curious persons will expect to find them inserted here, I shall just mention them.

The wild Pomgranate, with single and double flowers.

The sweet Pomgranate.

The small flowering Pomgranate, with single and double flowers.

The Pomgranate with striped flowers.

These plants grow naturally in *Spain, Portugal, Italy, and Mauritania*. There are also many of them in the *West-Indies*, but they are supposed to have been transplanted there from *Europe*. They are so much improved there, as to be much preferable to any in *Europe*, the fruit being larger and finer flavoured.

This tree rises with a woody stem eighteen or twenty feet high, garnished with narrow spear-shaped leaves, of a light lucid green, and stand opposite. The flowers come out at the end of the branches sometimes singly, and at others three or four together; one of the largest terminating the branch, and immediately under that are two or three smaller buds, which, after the flower is past, swell larger, and expand, whereby there is a continued succession of flowers for some months. The empalement of the flower is very thick, fleshy, and of one piece cut at the top into five segments; it is of a fine red colour, and within are included five (in the single flowers, but in the double a great number) of scarlet petals, which are inserted in the empalement. In the center is situated the style, arising from the germen, encompassed by many slender stamina, which are terminated by oblong yellowish summits. After the flower decays, the germen swells to a roundish fruit, crowned by the empalement, having a hard shell, including a pulp, filled with angular seeds.

The Balautia of the shops is the empalement of the flower of the double flowering Pomgranate.

The first of these trees is now pretty common in the *English* gardens, where formerly it was nursed up in cases, and preserved in green-houses with great care (as was also the double-flowering kind); but they are both hardy enough to resist the severest cold of our climate in the open air, and, if planted against warm walls in a good situation, the first sort will often produce fruit, which in warm seasons will ripen tolerably well; but as these fruits do not ripen till late in the autumn, they are seldom well tasted in *England*, for which reason the sort with double flowers is commonly preferred to it. The sort with sweet fruit, as also the wild sort, are less common in the *English* gardens than the former two.

These plants may be easily propagated by laying down their branches in the spring, which in one year's time will take good root, and may then be transplanted where they are designed to remain. The best season for transplanting of these trees is in spring, just before they begin to shoot; they should have a strong rich soil, in which they flower much better, and produce more fruit, than if planted on dry poor ground; but in order to obtain the flowers in plenty, there should be care taken in the pruning of these trees, for want of which we often see these trees very full of small shoots, but do not find many flowers produced upon them; therefore I shall set down directions for pruning of these trees, so as to obtain a great quantity of flowers and fruit.

The flowers of this tree always proceed from the extremity of the branches, which are produced the same year. This therefore directs, that all weak branches of the former year should be cut out, and that the stronger should be shortened, in proportion to their strength, in order to obtain new shoots in every part of the tree. The branches may be laid in against the wall about four or five inches asunder; for, as their leaves are small, there is not a necessity of allowing them a greater distance. The best time for this work is about *Michaelmas*, or a little later, according to the mildness of the season, for if they are left until spring before they are pruned, they seldom put out their shoots so early, and the earlier they come out, the sooner the flowers will appear, which is of great consequence where fruit is desired. In summer they will require no other dressing, but to cut off very vigorous shoots, which grow from the wall, and

never produce flowers (for it is the middling shoots only which are fruitful); and when the fruit is formed, the branches on which they grow should be fastened to the wall to support them, otherwise the weight of the fruit, when grown large, will be apt to break them down.

Though, as I said before, the fruit of this tree seldom arrives to any perfection in this country, so as to render it valuable; yet, for the beauty of its scarlet-coloured flowers, together with the variety of its fruit, there should be one tree planted in every good garden, since the culture is not great which they require; the chief care is to plant them upon a rich strong soil, and in a warm situation. Upon some trees which had these advantages, I have obtained a great quantity of fruit, which have arrived to their full magnitude, but I cannot say they were well-flavoured; however, they made a very handsome appearance upon the trees.

The double flowering kind is much more esteemed than the other in this country, for the sake of its large, fine, double flowers, which are of a most beautiful scarlet colour, and, if the trees are supplied with nourishment, will continue to produce flowers for near three months successively. This must be pruned and managed in the same manner as hath been already directed for the fruit-bearing kind, but this sort may be rendered more productive of its beautiful flowers, by grafting it upon stocks of the single kind, which will check the luxuriance of the trees, and cause them to produce flowers upon almost every shoot; by which method I have had a low tree, which was planted in the open air, extremely full of flowers, which made a very fine appearance.

The second sort grows naturally in the *West-Indies*, where the inhabitants plant it in their gardens to form hedges. It seldom rises more than five or six feet high in those countries, so may be kept within compass, and there the plants continue flowering great part of the year. The flowers of this kind are much smaller than those of the common sort; the leaves are shorter and narrower, and the fruit is not larger than a Nutmeg, and has little flavour, so it is chiefly propagated for the beauty of its flowers. This is undoubtedly a distinct species from the common sort, and is much tenderer.

This plant may be propagated by layers in the same manner as the former sorts, but must be planted in pots filled with rich earth, and preserved in a green-house, otherwise it is too tender to endure the cold of our winters, for though it may live abroad in a warm situation, yet it will make little progress in the summer, when the flowers begin to appear; if the plants are exposed to the open air, the buds often fall off, and never open, so that they should not be exposed to the open air, but placed in an airy glass-case, giving them a large share of air every day in mild weather. As they will be covered at the top by the glasses, the flowers will expand, and the fruit will grow to the full size in *England* with this management, though they are not very desirable; but hereby the plants may be continued in flower upward of three months, and will make a fine appearance.

PURSLAIN. See *Portulaca*.

PYRACANTHA. See *Mespilus*.

PYROLA. *Tourn. Inst. R. H. 256. tab. 132. Lin. Gen. Plant. 490. Winter-green.*

The Characters are,

The flower hath a permanent empalement cut into five parts; it hath five roundish, concave, spreading petals, and ten awl-shaped stamina, terminated by large nodding summits, with two rising horns, and a roundish germen, supporting a slender style, which is longer than the stamina, crowned by a thick stigma. The germen afterward becomes a roundish, depressed, five-cornered capsule,

capsule, with five cells opening at the angles, filled with seeds.

The Species are,

1. PYROLA *flaminibus adscendentibus, pistillo declinato*. Flor. Suec. 330. Winter-green with rising stamina, and a declining pointal.

2. PYROLA *racemo unilaterali*. Flor. Suec. 332. Winter-green with a bunch of flowers ranged on one side the foot-stalk.

3. PYROLA *scapo uniflora*. Flor. Lapp. 167. Winter-green with one flower on the stalk.

4. PYROLA *pedunculis bifloris*. Lin. Sp. Plant. 396. Winter-green with two flowers on a foot-stalk.

The first sort grows wild in many places in the north of England, particularly near *Hallifax* in *Yorkshire*, on rocky hills and heaths, as also in shady woods, so it is very difficult to preserve in gardens in the southern parts.

This hath a perennial root, from which spring out five or six roundish leaves about an inch and a half long, and almost as broad, of a thick consistence, of a deep lucid green, and entire, standing upon pretty long foot-stalks. Between these arise a slender upright stalk near a foot high, naked great part of the length, ending in a loose spike of flowers, which are composed of five large concave white petals, spreading open like a Rose, but the two upper leaves are formed into a kind of helmet. In the center is situated a crooked pointal, bending downward, attended by ten slender stamina, terminated by saffron-coloured summits.

The second sort grows naturally upon mountains in *Italy*, particularly near *Verona* and *Genoa*, and I have found it growing in *Westmoreland*. This hath a slender creeping perennial root, from which arise two or three very slender ligneous stalks about five inches high, sustaining at the top four or five oval acute-pointed leaves an inch and a half long, and one broad, of a thinner consistence, and a brighter green than those of the former, each standing upon a short foot-stalk; and between these, on the side of the stalk, comes out the foot-stalk of the flowers, upon which they are ranged along one side; they are shaped like the other, but are smaller, as are also the capsules.

The third sort grows naturally in shady woods in the northern parts of *Europe*. This hath a perennial creeping root, from which come forth four or five roundish leaves, of a pretty thick consistence, and between these arises a foot-stalk about four inches high, sustaining one large white flower on the top, of the same shape as the others.

The fourth sort grows naturally in *North America*. This hath a ligneous perennial root, from which arise two or three ligneous stalks a foot and a half high, garnished with stiff leaves two or three inches long, ending in acute points, having some sharp indentures on their borders; the midrib is remarkably broad, and very white, as are also the veins which run from it. The flowers are produced at the end of the stalk on slender foot-stalks about three inches long, each sustaining two small pale-coloured flowers at the top.

These are all of them very difficult to cultivate in gardens, for as they grow on very cold hills, and in mossy moorish soil, when they are removed to a better soil, and a warmer situation, they seldom continue long. The best time to transplant these plants into gardens is about *Michaelmas*, provided the roots can then be found, when they should be taken up with balls of earth to their roots, and planted in a shady situation, and on a moist undunged soil, where they should be frequently watered in dry weather, otherwise they will not thrive. Some of these plants may be planted in pots, which should be filled with earth as nearly resembling that, in which they naturally grow, as possible, and place them in a shady situation, where, if they are constantly watered in dry weather, they will thrive very well.

The first sort is ordered by the College of Physicians to be used in medicine, and is generally brought over from *Switzerland* amongst other vulnerary plants, in which class this plant is ranged, and by some hath been greatly commended.

PYRUS. *Tourn. Inst. R. H. 628. tab. 404.* The Pear-tree.

The Characters are,

The flower hath a permanent empalement of one leaf, which is divided into five parts at the top; it hath five roundish concave petals, which are inserted in the empalement, and about twenty awl-shaped stamina shorter than the petals inserted in the empalement, and terminated by single summits. The germen is situated under the flower, supporting three or four styles, crowned by single summits; it afterward becomes a pyramidal fleshy fruit, indented at the top, but produced at the base, having five membranaceous cells, each containing one smooth oblong seed pointed at the base.

The Pear and Quince may be joined together with more propriety than the Apple with either, for the fruit of the two former are produced at their base, whereas the Apple is indented, nor will the Apple grow upon either of the other two, or those upon the Apple, when grafted or budded, but the Quince or Pear will grow upon each other; so there is a boundary set by nature between those and the Apple.

The several varieties of Pears, which are now cultivated in the curious fruit gardens, have been accidentally obtained by seeds, so must not be deemed distinct species; but, as they are generally distinguished in the fruit-gardens and nursery by the shape, size, and flavour of their fruit; I shall continue those distinctions, that the work may not appear imperfect to such as delight in the cultivation of these fruits.

The Varieties are,

1. PYRUS *sativa, fructu aestivo parvo racemoso odoratissimo*. *Tourn.* Petit Muscat, *i. e.* Little Musk Pear, commonly called the Supreme. This fruit is generally produced in large clusters; it is rather round than long; the stalk short; and, when ripe, the skin is of a yellow colour; the juice is somewhat musky, and, if gathered before it is too ripe, is a good Pear. This ripens the beginning of *July*, and will continue good but for a few days.

2. PYRUS *sativa, fructu aestivo minimo odoratissimo*. *Tourn.* Poire de Chio, *i. e.* The Chio Pear, commonly called the little Bastard Musk Pear; this is smaller than the former; but is in shape pretty much like that. The skin, when ripe, has a few streaks of red on the side next the sun, and the fruit seldom hangs in clusters as the former, but in other respects is nearly like that.

3. PYRUS *sativa, fructu aestivo parvo, è virido albido*. *Tourn.* Poire Hâtiveau, *i. e.* the Hasting Pear: Poire Madeleine, ou Citron des Carmes. This is a larger Pear than either of the former, and is produced more toward the pedicle. The skin is thin, and of a whitish green colour when ripe; the flesh is melting, and, if not too ripe, of a sugary flavour, but is apt to be meally. This ripens in the middle of *July*.

4. PYRUS *sativa, fructu aestivo partim saturatè rubente, partim flavescente*. *Tourn.* Muscadelles Rouges, *i. e.* the red Muscadelle. It is also called La Bellissime. This is a large early Pear, of great beauty; the skin is of a fine yellow colour, when ripe, beautifully striped with red; the flesh is half melting, and has a rich flavour, if gathered before it be too ripe, but it is apt to be meally.

5. PYRUS *sativa, fructu aestivo parvo flavescente moscato*. *Tourn.* Petit Muscat, *i. e.* the little Muscat. This is a small Pear, rather round than long; the skin is very thin, and, when ripe, of a yellowish colour; the flesh is melting,

of a musky flavour, but will not keep long when ripe. This comes the end of July.

6. *PYRUS sativa, fructu aestivo oblongo ferrugineo, carne tenerâ moschatâ. Tourn.* Cuisse Madame, Lady's Thigh, in England commonly called Jargonelle. This is a very long Pear, of a pyramidal shape, having a long foot-stalk; the skin is pretty thick, of a russet green colour from the sun, but towards the sun it is inclined to an iron colour; the flesh is breaking, and has a rich musky flavour. Ripe the beginning of August. This is one of the best early summer Pears yet known, and is certainly what all the French gardeners call the Cuisse Madame, as may be easily observed by their description of this Pear; but I suppose that the titles of this and the Jargonelle, were changed in coming to England, and have been continued by the same names.

7. *PYRUS sativa, fructu oblongo, è viridi flavescente.* The Windsor Pear. This is an oblong fruit, which swells toward the crown, but near the stalk is drawn toward a point; the skin is smooth, and, when ripe, of a yellowish green colour; the flesh is very soft, and, if permitted to hang but two or three days after it is ripe, grows meally, and is good for nothing.

8. *PYRUS sativa, fructu aestivo oblongo, è viridi albo.* The Jargonelle, now commonly called Cuisse Madame. This is certainly what the French gardeners call the Jargonelle, which, as I before observed, is now in England given to another fruit much preferable to this, so that the two names are changed; for the Jargonelle is always placed amongst those which the French call bad fruit, and the Cuisse Madame is set down amongst their best fruit, which is certainly the reverse with us, as they are now named. This Pear is somewhat like the Windsor, but is not so swelling toward the crown, and is smaller toward the stalk; the skin is smooth, of a pale green colour; the flesh is apt to be meally, if it stands to be ripe, but, being a plentiful bearer, is much propagated for the London markets.

9. *PYRUS sativa, fructu aestivo globoso sessili moscato, maculis nigris conferso. Tourn.* Orange Mosquée, *i. e.* the Orange Musk. This is a middle-sized Pear, of a short globular form; the skin is of a yellowish colour, spotted with black; the flesh is musky, but is very apt to be a little dry and choaky. It ripens the beginning of August.

10. *PYRUS sativa, fructu aestivo albido majori. Tourn.* Gros Blanquet, *i. e.* Great Blanket. This is also called La Muffette d'Anjou, *i. e.* the Bagpipe of Anjou. This is a large Pear approaching to a round form; the skin is smooth, of a pale green colour; the flesh is soft, and full of juice, which hath a rich flavour; the stalk is short, thick, and spotted; the wood is slender, and the leaf is very much like that of the tree called the Jargonelle. This ripens the beginning of August.

11. *PYRUS sativa, fructu aestivo albido saccharato odoratissimo. Tourn.* The Blanquette, or Musk Blanquette; the little Blanket Pear. This Pear is much less than the former, and more pinched in near the stalk, which is also short, but slenderer than that of the former; the skin is soft, of a pale green colour; the flesh is tender, and full of a rich musky juice; the wood of this tree is much stronger than is that of the former, and the shoots are commonly shorter. This ripens the middle of August.

12. *PYRUS sativa, fructu aestivo albido, pediculo longo donato. Tourn.* Blanquette à longue queue, *i. e.* Long-stalked Blanket Pear. This Pear is in shape somewhat like the former, but the eye is larger, and more hollowed at the crown; toward the stalk it is somewhat plumper, and a little crooked; the skin is very smooth, white, and sometimes toward the sun is a little coloured; the flesh is between melting and breaking, and is full of a rich sugary juice. This ripens the middle of August.

13. *PYRUS sativa, fructu aestivo oblongo rufescente saccharato. Tourn.* Poire sans Peau, *i. e.* the Skinless Pear. It is also called Fleur de Guigne, *i. e.* Flower of Guigne, and by some Rouffelet hâtif, *i. e.* the early Russelet. This is a middle-sized fruit, of a long shape, and a reddish colour, somewhat like the Russelet; the skin is extremely thin; the flesh is melting, and full of a rich sugary juice; the shoots are long and strait. This ripens the middle of August.

14. *PYRUS sativa, fructu aestivo turbinato, carne tenerâ saccharatâ. Muscat Robine, i. e. the Musk Robine Pear.* This is also called Poire à la Reine, *i. e.* the Queen's Pear; Poire d'Ambre, *i. e.* the Amber Pear; and Pucelle de Xaintonge, *i. e.* the Virgin of Xaintonge. This is a small round Pear, of a yellowish colour when ripe; the flesh is between melting and breaking. It hath a rich musky flavour, and is a great bearer. It ripens the middle of August.

15. *PYRUS sativa, fructu aestivo turbinato moscato. La Bourdon Mosque, i. e. the Musk Drone Pear.* This is a middle-sized round fruit, whose skin is of a yellowish colour when ripe; the flesh is melting, and full of a high musky juice, but it must not hang too long on the tree, for it is subject to grow meally in a short time. This ripens the end of August.

16. *PYRUS sativa, fructu aestivo globoso sessili, è viridi purpurascete saccharato odorato. Tourn.* Orange Rouge, *i. e.* the red Orange Pear. This Pear hath been the most common of all the sorts in France, which was occasioned by the general esteem it was in some years since. It is a middle-sized round fruit, of a greenish colour, but the side next the sun changes to a purple colour when ripe; the flesh is melting, and the juice is sugared with a little perfume; the eye is very hollow, and the stalk is short. This ripens the end of August.

17. *PYRUS sativa, fructu aestivo oblongo minori cinereo odorato. Tourn.* Cassolette Friolet, Muscat Verd Lechefrion; this is so called from its being shaped like a perfuming pot. It is a long fruit, in shape like the Jargonelle, of an Ash-colour; its flesh is melting, and full of a perfumed juice, but it is very apt to rot in the middle as soon as ripe, otherwise it would be esteemed an excellent Pear. It is ripe the end of August.

18. *PYRUS sativa, fructu aestivo turbinato, è viridi albido. Orange Musquée, i. e. the Musk Orange Pear.* This is a large round Pear, in shape like a Bergamot; the skin is green, and the flesh is melting, but it is very subject to rot upon the tree, which renders it not near so valuable as some others. It ripens the end of August.

19. *PYRUS sativa, fructu aestivo globoso è viridi purpurascete. Tourn.* Gros Oignonnet, *i. e.* the great Onion Pear. It is also called Amiré-roux, *i. e.* Brown Admired; and Roy d'Été, *i. e.* King of Summer; Archiduc d'Été, *i. e.* the Summer Archduke. This is a middle-sized round Pear, of a brownish colour next the sun; the flesh is melting, and the juice is passably good. This ripens the end of August.

20. *PYRUS sativa, fructu aestivo globoso sessili ex albido flavescete saccharato odorato. Tourn. Robine.* It is also called Muscat d'August, *i. e.* the August Muscat; Poire d'Averat, *i. e.* the Averat Pear; and Poire Royale, *i. e.* the Royal Pear. This is a roundish flat Pear, in shape very like a Bergamot; the stalk is long, strait, and a little spotted, and the eye is a little hollowed; the skin is smooth, of a whitish yellow colour; the flesh is breaking, but not hard, and its juice is richly sugared and perfumed. It is a great bearer, and is esteemed one of the best summer Pears yet known. It ripens the end of August.

21. *PYRUS sativa, fructu aestivo globoso sessili odorato. Tourn.* Poire-rose, *i. e.* the Rose Pear; and L'Épinerose, *i. e.* the Thorny Rose. This is a short round fruit, shaped like the great Onion Pear, but much larger, of a yellowish

green colour, but a little inclining to red on the side next the sun; the stalk is very long and slender; the flesh is breaking, and the juice is musky. This ripens the end of August. The shoots and the leaves of this tree are large.

22. *PYRUS sativa, fructu aestivo globoso albido saccharato.* Tourn. Poire du Pouchet. This is a large round whitish Pear, shaped somewhat like the Besidéri; the flesh is soft and tender, and the juice is sugary. This ripens the end of August.

23. *PYRUS sativa, fructu aestivo turbinato sessili saturatius rubente punctato.* Tourn. Poire de Parfum, *i. e.* the perfumed Pear. This is a middle-sized round fruit, whose skin is somewhat thick and tough, and of a deep red colour spotted with brown; the flesh is melting, but dry, and has a perfumed flavour. This ripens the end of August.

24. *PYRUS sativa, fructu aestivo oblongo magno, partim rubro, partim albido, odorato.* Tourn. Boncrétien d'Été, *i. e.* the Summer Boncrétien, or Good Christian. This is a large oblong fruit, whose skin is smooth and thin; the side next the sun is of a beautiful red colour, but the other side is of a whitish green; the flesh is between breaking and tender, and is very full of juice, which is of a rich perfumed flavour. It ripens the beginning of September.

25. *PYRUS sativa, fructu aestivo globoso, ex rubro albidoque rubente saccharato odorato.* Tourn. Sab-viati. This Pear is large, round, and flat, very much like the Besidéri in shape, but not in colour; the stalk is very long and slender, and the fruit is a little hollowed both at the eye and stalk; the colour is red and yellow next the sun, but on the other side is whitish; the skin is rough; the flesh is tender, but a little soft, and has no core; the juice is sugary and perfumed, somewhat like the Robine, but is not near so moist. This ripens the beginning of September.

26. *PYRUS sativa, fructu aestivo globoso sessili rufescente odorato.* Tourn. Caillot-rosat, *i. e.* Rose-water Pear. This is a large round Pear, somewhat like the Messire-Jean, but rounder; the stalk is very short, and the fruit is hollowed like an Apple, where the stalk is produced; the skin is rough, and of a brown colour; the flesh is breaking, and the juice is very sweet. This ripens the middle of September.

27. *PYRUS sativa, fructu aestivo longo, acerbitate strangulationem minitante.* Tourn. Poire d'Etrangillon, *i. e.* the Choaky Pear; the flesh is red. This is seldom preserved in gardens, so there needs no description of it.

28. *PYRUS sativa, fructu aestivo oblongo à ferrugineo rubente, nonnunquam maculato.* Poire du Rousselet, *i. e.* the Rousselet Pear. This is a large oblong Pear; the skin is brown, and of a dark red colour next the sun; the flesh is soft and tender, without much core; the juice is agreeably perfumed, if gathered before it be too ripe. This produces larger fruit on an espalier than on standard-trees. It ripens the middle of September.

29. *PYRUS sativa, fructu aestivo subrotundo, partim rubro, partim flavescente, odorato.* Poire de Prince, *i. e.* the Prince's Pear. This is a small roundish Pear, of a bright red colour next the sun, but of a yellowish colour on the opposite side; the flesh is between breaking and melting: the juice is very high-flavoured. It is a great bearer. It ripens the middle of September, but will keep a fortnight good, which is what few summer fruits will do.

30. *PYRUS sativa, fructu aestivo globoso viridi, in ore liquescente.* Gros Mouille-bouche, *i. e.* the great Mouthwater Pear. This is a large round Pear, with a smooth green skin; the stalk is short and thick; the flesh is melting, and full of juice, if gathered before it be too ripe, otherwise it is apt to grow mealy. This ripens the middle of September.

31. *PYRUS sativa, fructu aestivo rotundo sessili saccharato, à viridi flavescente.* Bergamotte d'Été, *i. e.* Summer Berga-

mot; this is by some called the *Hamden's* Bergamot. It is a pretty large round flat Pear, of a greenish yellow colour, and hollowed a little at both ends like an Apple; the flesh is melting, and the juice is highly perfumed. This ripens the middle of September.

32. *PYRUS sativa, fructu autumnali sessili saccharato odorato, à viridi flavescente, in ore liquescente.* Tourn. Bergamotte d'Automne, *i. e.* the Autumn Bergamot. This is a smaller Pear than the former, but is nearly of the same shape; the skin is of a yellowish green, but changes to a faint red on the side next the sun; the flesh is melting, and its juice is richly perfumed. It is a great bearer, ripens the end of September, and is one of the best Pears of the season.

33. *PYRUS sativa, fructu autumnali turbinato viridi, striis sanguineis distincta.* Tourn. Bergamotte de Suisse, *i. e.* the Swiss Bergamot. This Pear is somewhat rounder than either of the former; the skin is tough, of a greenish colour, striped with red; the flesh is melting, and full of juice, but is not so richly perfumed as either of the former. This ripens the end of September.

34. *PYRUS sativa, fructu autumnali suavissimo, in ore liquescente.* Tourn. Beurré rouge, *i. e.* the red Butter Pear. It is called l'Amboise, and in Normandy Isambert; as also Beurré gris, *i. e.* the gray Butter; and Beurré vert, *i. e.* the green Butter Pear. All these different names of Beurrés have been occasioned by the difference of the colours of the same sort of Pear, which is either owing to the different exposure where they grew, or from the stock, those upon free stocks being commonly of a browner colour than those which are upon Quince-stocks; whence some persons have supposed them to be different fruits, though in reality they are the same. This is a large long fruit, for the most part of a brown colour. The flesh is very melting, and full of a rich sugary juice. It ripens the beginning of October, and, when gathered from the tree, is one of the very best sort of Pears we have.

35. *PYRUS sativa, fructu autumnali turbinato sessili flavescente, & in ore liquescente.* Tourn. Le Doyenne, *i. e.* the Dean's Pear. It is also called by all the following names; Saint Michel; Beurré blanc d'Automne, *i. e.* the white autumn Butter Pear; Poire de Neige, *i. e.* the Snow Pear; Bonne Ente, *i. e.* a good Graft; the Carlisle and Valencia. It is a large fair fruit, in shape somewhat like the grey Beurré, but shorter and rounder; the skin is smooth, and, when ripe, changes to a yellowish colour; the flesh is melting, and full of juice, which is very cold, but it will not keep good a week after it is gathered, being very subject to grow mealy; it is a very indifferent fruit, but a great bearer, and ripens the beginning of October.

36. *PYRUS sativa, fructu autumnali longo viridique odorato, in ore liquescente.* Tourn. La Verte-longue, *i. e.* the long green Pear. It is also called Mouille-bouche d'Automne, *i. e.* the Autumn Mouth-water Pear. This is a long fruit, which is very green when ripe; the flesh is melting, and full of juice, which, if it grows upon a dry warm soil, and a free stock, is very sugary, otherwise it is but a very indifferent Pear. It ripens the middle of October, but some years they will keep till December.

37. *PYRUS sativa, fructu autumnali tuberoso sessili saccharato, carne durâ.* Tourn. Messire Jean blanc & gris, *i. e.* the white and gray Monsieur John. These, although made two sorts of fruit by many persons, are indubitably the same; the difference of their colour proceeding from the different soils and situations where they grow, or the stocks on which they are grafted. This Pear, when grafted on a free stock, and planted on a middling soil, neither too wet nor over-dry; is one of the best autumn Pears yet known; but when it is grafted on a Quince-stock, it is very apt to be stony, or if planted on a very dry soil, is very apt to be small

small and good for little, unless the trees are watered in dry seasons, which has rendered it less esteemed by some persons, who have not considered the cause of their hardness; for when it is rightly managed, there are not many Pears in the same season to be compared with it. This is a large roundish fruit; the skin is rough, and commonly of a brown colour; the flesh is breaking, and very full of a rich sugared juice. It ripens the end of *October*, and will continue good near a month.

38. *PYRUS sativa, fructu autumnali globofo ferrugineo, carne tenerâ sapidissimâ. Tourn.* Muscat fleuri, *i. e.* the flowered Muscat. It is also called *Muscat à longue queue d'Automne, i. e.* the long stalked Muscat of the Autumn. This is an excellent Pear, of a middling size, round; the skin is of a dark red colour; the flesh is very tender, and of a delicate flavour. It ripens the end of *October*.

39. *PYRUS sativa, fructu autumnali globofo ferrugineo, carne viscidâ. Tourn.* Poire de Vigne, *i. e.* the Vine Pear. This is a round fruit, of a middling size; the skin of a dark red colour; the flesh is very melting, and full of a clammy juice; the stalk is very long and slender. The fruit should be gathered before it be full ripe, otherwise it grows mealy and soon rots. It ripens the end of *October*.

40. *PYRUS sativa, fructu autumnali oblongo, dilutè rufescente, saccharato, odoratissimo. Tourn.* Poire Rouffeline, *i. e.* the Rouffeline Pear. It is also called in *Touraine*, *Le Muscat à longue queue de la fin d'Automne, i. e.* the long stalked Muscat of the End of Autumn. This is by some *English* gardeners called the Brute-bonne, but that is a very different fruit from this. It is shaped somewhat like the Russet, but the skin of this is smooth, and of a greenish yellow from the sun, but the side next the sun is of a deep red colour, with some spots of gray; the flesh is very tender and delicate; the juice is very sweet, with an agreeable perfume. It ripens the middle of *October*, but must not be long kept, lest it rot in the middle.

41. *PYRUS sativa, fructu autumnali oblongo majori cinerco. Tourn.* Poire Pendart, *i. e.* the Knave's Pear. This is very like the Cassolette Pear, but is somewhat larger; the flesh is fine and tender; the juice is very much sugared. It ripens the end of *October*.

42. *PYRUS sativa, fructu autumnali turbinato tuberoso viridi saccharato, in ore liquescente. Tourn.* Sucre vert, *i. e.* the green Sugar Pear. This Pear is shaped like the Winter-Thorn, but is smaller; the skin is very smooth and green; the flesh is very buttery; the juice is sugared, and of an agreeable flavour; but it is sometimes subject to be stony in the middle, especially if grafted on a Quince-stock.

43. *PYRUS sativa, fructu autumnali tuberosa sessili, è viridi flavescente, maculis nigris consperso, carne tenerâ saccharatâ. Tourn.* La Marquise, *i. e.* the Marquis's Pear. This is often of two different shapes, according to the nature of the soil where they are planted, for when the soil is dry, the fruit very much resembles a fine Blanquet; but when the soil is very rich and moist, it grows much larger. It is a well-shaped Pear, flat at the top; the eye is small and hollowed; the skin is of a greenish yellow, a little inclining to red on the side next the sun. If this Pear does not change yellow in ripening, it is seldom good; but if it does, the flesh will be tender and delicate, very full of juice, which is sugared. It ripens the beginning of *November*.

44. *PYRUS sativa, fructu autumnali oblongo, partim albido, partim rufescente. The Chat-brulé, i. e.* the Burnt Cat. This is a small oblong Pear, shaped much like the Martin Sec, but differs from it in colour; this being of a pale colour on one side, but of a dark brown on the other; the skin is smooth; the flesh is tender, but dry, and, if kept a short time, is apt to grow mealy. It is in eating the beginning of *November*.

45. *PYRUS sativa, fructu autumnali globofo sessili, ex albido flavescente. Le Besidéri. It is so called from Heri, which is a forest in Bretagne, between Rennes and Nantes, where this Pear was found. This is a middle-sized round Pear, of a pale green, inclining to a yellowish colour; the stalk is very long and slender; the flesh is dry, and but very indifferent for eating, but it bakes well. It ripens the middle of November.*

46. *PYRUS sativa, fructu brumali sessili, è viridi flavescente, maculato, utrinque umbilicato, in ore liquescente. Tourn.* The Crasane, or Bergamot Crasane. It is also called Beurré Plat, *i. e.* the flat Butter Pear. This is a middle-sized Pear, hollowed at the crown like an Apple; the stalk is very long and crooked; the skin is of a greenish yellow colour when ripe, covered over with a russet coat; the flesh is extremely tender and buttery, and is full of a rich sugared juice, and is the very best Pear of the season. This is in eating the beginning of *November*.

47. *PYRUS sativa, fructu brumali turbinato sessili flavescente saccharato odorato, in ore liquescente. Tourn.* Lansac ou la Dauphine, *i. e.* the Lansac or Dauphine Pear. This Pear is commonly about the size of a Bergamot, of a roundish figure, flat towards the head, but a little produced towards the stalk; the skin is smooth, and of a yellowish green colour; the flesh is yellow, tender, and melting; the juice is sugared, and a little perfumed; the eye is very large, as is also the flower; the stalk is long and strait. When this Pear is upon a free stock, and planted on a good soil, it is one of the best fruits of the season; but when it is on a Quince-stock, or upon a very dry soil, the fruit will be small, stony, and worth little. It ripens the end of *November*.

48. *PYRUS sativa, fructu brumali oblongo, partim intense, partim dilutè ferrugineo, saccharato, odorato. Tourn.* Martin Sec, *i. e.* the Dry Martin. This is sometimes called the Dry Martin of *Champagne*, to distinguish it from another Dry Martin of *Burgundy*. This Pear is almost like the Russet in shape and colour, which has occasioned some persons to give it the name of Winter Russet. It is an oblong Pear, whose skin is of a deep russet colour on one side, but the other side is inclining to a red; the flesh is breaking and fine; the juice is sugared, with a little perfume, and if grafted on a free-stock, is an excellent Pear, but if it be on a Quince-stock, it is very apt to be stony. It is in eating the end of *November*, but if they were permitted to hang their full time on the tree, will keep good two months.

49. *PYRUS sativa, fructu brumali magno sessili, è cinerco flavescente. Tourn.* La Villaine d'Arjou, *i. e.* the Villain of Anjou. It is also called Poire Tulipée, *i. e.* the Tulip Pear, and Bigarrade, *i. e.* the Great Orange. This is a large round Pear, with a very long slender stalk; the skin is of a pale yellow colour; the flesh is breaking, but not very full of juice. This is in eating the end of *November*.

50. *PYRUS sativa, fructu brumali flavescente odoratissimo, pediculo crassiori. Tourn.* Poire de gros queue, *i. e.* the large stalked Pear. This is a large roundish Pear, with a yellow skin; the stalk is very thick, from whence it had the name; the flesh is breaking, dry, and has a very musky flavour; but it is apt to be stony, especially if it be planted in a dry soil, or grafted on a Quince-stock, as are most of the perfumed Pears.

51. *PYRUS sativa, fructu brumali turbinato rufescente odorato. L'Amadote, i. e.* the Amadot Pear. This is a middle-sized Pear, somewhat long, but flat at the top; the skin is generally rough, and of a russet colour; the flesh is dry, and high flavoured, if grafted on a free-stock. The wood of this tree is generally thorny, and is esteemed the best sort of Pears for stocks to graft the melting Pears upon, because it gives them some of its fine musky flavour. It is in eating the beginning of *December*, but will keep good six weeks.

52. *PYRUS jativa, fructu brumali, globoso, dilute virente, tuberoso, punctato, in ore liquescente. Tourn.* Petit Oin, *i. e.* Little Lard Pear. It is also called Bouvar and Roussette d'Anjou, *i. e.* the Ruffet of Anjou; and Amadont, and Marveille d'Hyver, *i. e.* the Wonder of the Winter. This Pear is of the size and shape of the Ambret or L'Eschafferie, but the skin is of a clear green colour, and a little spotted; the stalk is pretty long and slender; the eye is large, and deeply hollowed; the flesh is extremely fine, and melting; the juice is much sugared, and has an agreeable musky flavour. It is in eating the middle of *December*, and is esteemed one of the best fruits in that season. This is better on a free-stock than upon the Quince.

53. *PYRUS sativa, fructu brumali longo è viridi albicante, in ore liquescente. Tourn.* Louisebonne, *i. e.* the Good Lewis Pear. This Pear is shaped somewhat like the St. Germain, or the Autumn Verte-longue, but is not quite so much pointed; the stalk is very short, fleshy, and somewhat bent; the eye and the flower are small; the skin is very smooth; the colour is green, inclining to a white when ripe; the flesh is extremely tender and full of juice, which is very sweet, especially when it grows upon a dry soil, otherwise it is apt to be very large and ill tasted. It is in eating the beginning of *December*.

54. *PYRUS sativa, fructu brumali, tuberoso, è viridi flavescente, punctato, saccharato. Tourn.* Poire de Colmar, *i. e.* the Colmar Pear. It is also called Poire Manne, the Manna Pear, and Bergamotte tardive, the late Bergamot. This Pear is somewhat like a Boncrétien in shape, but the head is flat; the eye is large, and deeply hollowed: the middle is larger than the head, and is sloped toward the stalk, which is short, large, and a little bent; the skin is green, with a few yellowish spots, but is sometimes a little coloured on the side next the sun; the flesh is very tender, and the juice is greatly sugared. It is in eating the latter end of *December*, but will often keep good till the end of *January*, and is esteemed one of the best fruits of that season.

55. *PYRUS sativa, fructu brumali, globoso, citrifermi, flavescente, punctato, in ore liquescente, saccharato, odoratissimo. Tourn.* L'Eschafferie. It is also called Verte-longue d'Hyver, *i. e.* the Winter long green Pear, and Besidéri, Landri, *i. e.* the Landry Wilding. This Pear is shaped like a Citron; the skin is smooth, and of a green colour, with some spots while it hangs on the tree, but as it ripens it becomes of a yellowish colour; the stalk is strait and long; the eye is small, and not hollowed; the flesh is melting and buttery; the juice is sugared, with a little perfume. It is in eating the latter end of *December*.

56. *PYRUS sativa, fructu brumali longo, è viridi flavescente, in ore liquescente, saccharato. Tourn.* Le Virgoulé, or La Virgouleuse. It is also called Bujaleuf, and Chambrette; and Poire de Glasse, *i. e.* the Ice Pear in *Gascoigne*; but it is called *Virgoulé*, from a village of that name in the neighbourhood of *St. Leonard* in *Limousin*, where it was raised and sent to *Paris* by the Marquis of *Chambert*. This Pear is large, long, and of a green colour, inclining to yellow as it ripens; the stalk is short, fleshy, and a little bent; the eye is of a middling size, a little hollowed; the skin is very smooth, and sometimes a little coloured towards the sun; the flesh is melting, and full of a rich juice. It is in eating the latter end of *December*, and will continue good till the end of *January*, and is esteemed one of the best fruits of the season; but the tree is very apt to produce vigorous shoots, and the blossoms being generally produced at the extreme part of the shoot, where they are shortened, the fruit will be entirely cut away, which is the reason it is condemned as a bad bearer; but when it is grafted on a free-stock, it ought to be allowed at least forty feet to spread; and if upon a Quince-stock, it should be allowed upwards

of thirty feet, and the branches trained in against the espalier or wall, at full length, in a horizontal position, as they are produced. Where this tree is thus treated, it will bear very plentifully, and the fruit will be good.

57. *PYRUS sativa, spinosa, fructu globoso, sessili, ferrugineo, in ore liquescente, saccharato, odoratissimo. Tourn.* Poire d'Ambrette. This is so called from its musky flavour, which resembles the smell of the Sweet Sultan-flower, which is called *Ambrette* in *France*. This Pear is like the L'Eschafferie in shape, but is of a ruffet colour; the eye is larger, and more hollowed; the flesh is melting; the juice is richly sugared and perfumed; the seeds are large, black, and the cells in which they are lodged are very large; the wood is very thorny, especially when grafted on free-stocks. The fruit is in eating the latter end of *December*, and continues good till the latter end of *January*, and is esteemed a very good fruit by most people.

58. *PYRUS sativa, fructu brumali, magno, pyramidato, albedo, in ore liquescente, saccharato, odorato. Tourn.* Epine d'Hyver, *i. e.* Winter-thorn Pear. This is a large fine Pear, nearly of a pyramidal figure; the skin is smooth, of a pale green colour, inclining to yellow as it ripens; the stalk is short and slender; the flesh is melting and buttery; the juice is very sweet, and in a dry season is highly perfumed; but when it is planted on a moist soil, or the season proves wet, it is very insipid, so that it should never be planted on a strong soil. It ripens the end of *December*, and will continue good two months.

59. *PYRUS sativa, fructu brumali longo, è viridi flavescente, in ore liquescente. Tourn.* La Saint Germain, *i. e.* the St. Germain Pear. It is also called L'Inconnue de la Fare, *i. e.* the Unknown of *La Fare*; it being first discovered upon the banks of a river which is called by that name, in the parish of *St. Germain*. This is a large long Pear, of a yellowish green colour when ripe; the flesh is melting, and very full of juice, which in a dry season, or if planted on a warm dry soil, is very sweet; but when it is planted on a moist soil, the juice is very apt to be harsh and austere, which renders it less esteemed by some persons, though in general it is greatly valued. This is in eating from the end of *December* till *February*.

60. *PYRUS sativa, fructu brumali tuberoso subacido flavescente punctato. Tourn.* Saint Austin. This is about the size of a middling *Virgoulé* Pear, but is somewhat shorter and slenderer near the stalk; the skin is of a fine Citron colour, spotted with red on the side next the sun; the flesh is tender, but not buttery, and is pretty full of juice, which is often a little sharp, which to some persons is disagreeable, but others value it on that account. This is in eating in *December*, and will continue good two months.

61. *PYRUS sativa, fructu brumali pyramidato, partim purpureo, punctis nigris consperso, flavescente. Tourn.* Boncrétien d'Espagne, *i. e.* the Spanish Boncrétien. This is a large Pear, of a pyramidal form, of a fine red or purple colour on the side next the sun, and full of small black spots; the other side is of a pale yellow colour; the flesh is breaking, and when it is on a light rich soil, and grafted on a free-stock, its juice is very sweet. It ripens in the end of *December*, and will continue good a month or six weeks. If this be grafted on a Quince-stock, it is very apt to be dry and stony. This is a very good fruit for baking.

62. *PYRUS sativa, fructu brumali, magno, oblongo, turbinato, ferrugineo, utrinque umbilicato. Tourn.* Poire de Livre, *i. e.* the Pound Pear. It is also called Gros Ratteau Gris, *i. e.* the gray raked Pear; and Poire d'Amour, *i. e.* the Lovely Pear. In *England* this is called *Parkinson's Warden*, or the Black Pear of *Worcester*. This is a very large Pear, each of which commonly weighs a pound or more; the skin is rough, and of an obscure red colour on the side next

next the sun, but somewhat paler on the other; the stalk is very short, and the eye is greatly hollowed. This is not fit for eating, but bakes or stews exceeding well, and is in season from *December* to *March*.

63. *PYRUS sativa, fructu brumali parvo flavescente, maculis rubris consperso. Tourn.* Besi de Cassoy, *i. e.* the Wilding of Cassoy, a forest in *Bretagne*, where it was discovered, and passes under the name of Rouffet d'Anjou. It is also called Petit Beurré d'Hyver, *i. e.* the small Winter Butter Pear. This is a small oblong Pear, of a yellowish colour, spotted with red; the flesh is melting, and the juice is very rich. It is in eating in *December* and *January*. This is a prodigious bearer, and commonly produces its fruit in large clusters, provided it be not too much pruned; for it generally produces its blossom-buds at the extremity of its shoots, which, if shortened, the fruit would be cut away. There was a tree of this kind in the gardens of *Camden-house* near *Kenington*, which generally produced a great quantity of fruit.

64. *PYRUS sativa, fructu brumali turbinato inæquali, ventre tumido, partim purpureo, partim flavescente. Tourn.* Ronville. It is also called Hocrenaille and Martin sire, *i. e.* the Lord Martin Pear. This Pear is about the size and shape of a large Rufflet; the eye is of a middling size, and hollowed a little; the middle of the Pear is generally swelled more on one side than on the other, but is equally extended towards the stalk; the skin is very smooth, soft, and is of a lively red colour next the sun, but on the other side it changes yellow as it ripens. The flesh is breaking, and full of juice, which is very sweet, and a little perfumed; but if grafted on a Quince-stock, is very apt to be small and stony.

65. *PYRUS sativa, fructu brumali citriforini flavescente duro moschato odoratissimo. Tourn.* Citron d'Hyver, *i. e.* the Winter Citron Pear. It is also called the Musk Orange Pear, in some places. This is a pretty large Pear, in shape and colour very like an Orange or Citron, from whence it had its name. The flesh is hard, dry, and very subject to be stony; for which reasons it is not valued as an eating Pear, but will bake very well. It is in season from *December* to *March*.

66. *PYRUS sativa, fructu brumali oblongo, è viridi flavescente, saccharato, saporis austeri. Tourn.* Rufflet d'Hyver, *i. e.* the Winter Rufflet. This is by some supposed to be the same Pear as is called the Dry Martin, but it is very different from that in several particulars. The colour of this is a greenish yellow, inclining to brown; the stalk is long and slender; the flesh is buttery, melting, and generally full of juice, which is very sweet, but the skin is apt to contain an austere juice, so that if it be not pared, it is apt to be disagreeable to many persons palates. It is in eating in *January* and *February*.

67. *PYRUS sativa Pictaviensis, fructu brumali globoso sessili saccharato odorato. Tourn.* Poire Portail, *i. e.* the Gate Pear. This Pear was discovered in the Province of *Poitou*, where it was so much esteemed, that they preferred it to most other fruit, though in the opinion of the most curious judges, it does not deserve the great character which is given to it; for it rarely happens that it proves good for eating, being generally dry, stony, and hard, unless in extraordinary seasons, and upon a very good soil. This must always be grafted on a free-stock, and should be planted on a light rich soil; and in very dry seasons the trees should be watered, otherwise the fruit will be stony. It is in season from *January* to *March*, and bakes well.

68. *PYRUS sativa, fructu brumali magno globoso flavescente, punctis rubris consperso. Tourn.* Franc real. It is also called Fin-or d'Hyver, *i. e.* the Golden End of Winter. This is a very large Pear, almost of a globular figure; the skin is yellow, spotted with red; the stalk is short, and the wood

of the tree mealy. The flesh of this Pear is dry, and very apt to be stony, but it bakes exceeding well, and continues good from *January* till *March*.

69. *PYRUS sativa, fructu brumali turbinato sessili subacido flavescente, punctis asperioribus consperso. Tourn.* Bergamotte Bugi. It is also called Bergamotte de Pasque, *i. e.* the Easter Bergamot. It is a large Pear, almost round, but is a little produced in length towards the stalk; the eye is flat, and the skin is green, having many rough protuberances like spots dispersed all over, but, as it ripens, becomes yellowish; the flesh is breaking, and in a good season the juice is sweet; but it must have a free-stock, a south east wall, and a good soil, otherwise it is apt to be stony and austere. It is in eating from *February* till *April*.

70. *LE MUSCAT D'ALLEMAN, i. e.* the German Muscat. This is an excellent Pear, more long than round, of the shape of the Winter-royal, but is less toward the eye, is more rufflet, and of a red colour next the sun; it is buttery, melting, and a little musky. This is in eating in *March* and *April*.

71. *LE BERGAMOTTE D'HOLLANDE, i. e.* the Holland Bergamot; it is large and round, of the shape of the ordinary Bergamot. The colour is greenish; the flesh is half buttery and tender; the juice is highly flavoured. This is a very good Pear, and will keep till *March*.

72. *LE POIRE DE NAPLES, i. e.* the Pear of Naples. This is a pretty large, long, greenish Pear; the flesh is half breaking; the juice is sweet, and a little vinous. It is in eating in *March*. I am in doubt whether this Pear is not in some places taken for a Saint Germain, for there is a Pear in some gardens very like the Saint Germain, which will keep till *April*, and this Pear agrees with the characters of that. It is called in *England* the Easter St. Germain.

73. *PYRUS sativa, fructu brumali magno pyramidato, è flavo nonnihil rubente. Tourn.* Boncrétien d'Hyver, *i. e.* the Winter Boncrétien Pear. This Pear is very large and long, of a pyramidal figure; the skin is of a yellowish colour, but the side next the sun inclines to a soft red; the flesh is breaking, and is very full of rich sugared juice. This is esteemed in *France* one of the best winter Pears, but in *England* it is seldom so good; though I am fully satisfied, if it were grafted on a free-stock, and planted in a good soil, against a wall exposed to the south east, and the branches trained at full length, it might be rendered more acceptable than it is at present in *England*.

74. *PYRUS sativa, fructu brumali magno, cydoniæ facie, partim flavo, partim purpureo. Tourn.* Catillac or Cadillac. This is a large Pear, shaped somewhat like a Quince; the skin is for the most part of a yellow colour, but changes to a deep red on the side next the sun; the flesh is hard, and the juice austere, but it is a very good fruit for baking, and being a plentiful bearer, deserves a place in every good collection of fruit. It will be good from *Christmas* to *April*, or longer.

75. *PYRUS sativa, fructu brumali oblongo flavescente, punctis rubris consperso. La Pastorelle.* This Pear is of the size and shape of a fine Rufflet; the stalk is short and crooked; the skin is somewhat rough, of a yellowish colour, spotted with red; the flesh is tender, buttery, and when it grows on a dry soil, the juice is very sweet; but on a wet soil, or in moist years, it is subject to have an austere taste. This Pear is in eating in *February* and *March*.

76. *PYRUS sativa, fructu brumali sessili, partim flavescente, partim purpurascete. Tourn.* La Double Fleur, *i. e.* the double flowering Pear. This is so called, because the flowers have a double range of petals or leaves. It is a large short Pear; the stalk is long and strait; the skin is very smooth, of a yellowish colour, but the side next the sun is commonly of a fine red or purple colour. This is by some esteemed for

for eating, but it is generally too austere in this country for that purpose. It is the best Pear in the world for baking or composts. It is good from *February* to *May*.

77. *PYRUS sativa, fructu brumali oblongo, partim flavescente, partim purpurascente.* Saint Martial. It is also called in some places *Poire Angelique, i. e.* the Angelick Pear. This Pear is oblong, in shape like the Boncrézien, but not so large, a little flatter at the crown; it has a very long stalk; the skin is smooth and yellowish, but on the side next the sun it turns to a purplish colour; the flesh is tender, buttery, and the juice is very sweet. This is in eating in *February* and *March*, and will keep very long.

78. *PYRUS sativa, fructu brumali oblongo, partim albido, partim purpureo odorato, saccharato.* La Poire de Chaumontelle, or Besi de Chaumontelle, *i. e.* the Wilding of *Chaumontelle*. This Pear is in shape somewhat like the Autumn Beurré, but is flatter at the crown; the skin is a little rough, of a pale green colour, but turns to a purplish colour next the sun; the flesh is melting; the juice is very rich, and a little perfumed. It is in eating from *November* to *January*, and is esteemed by some the best late Pear yet known.

79. *PYRUS sativa, fructu brumali globoso sessili cinerco maculis amplis obscurioribus consperso.* Town. Carmelite. This is a middle-sized Pear, of a roundish form; the skin is of a gray colour on one side, but is inclined to a red on the other, having some broad spots of a dark colour all over; the flesh is commonly hard and dry, so that it is not very much esteemed. It is in season in *March*.

80. *PYRUS sativa, fructu brumali maximo pyramidato, dilute virente.* The Union Pear, otherwise called *Dr. Uvedale's St. Germain*. This is a very large long Pear, of a deep green colour, but the side next the sun doth sometimes change to a red as it ripens. This is not fit for eating, but bakes very well; and being a great bearer, and a very large fruit, deserves a place in every good collection. It is in season from *Christmas* to *April*.

The time of each fruit ripening, as here set down, is taken at a medium for seven years, and in the neighbourhood of *London*, where all sorts of fruit generally ripen a fortnight or three weeks earlier than in almost any part of *England*, it is very obvious to every person, who will attend to the culture of fruit-trees, that their time of ripening is accelerated by long cultivation; for many of the sorts of Pears, which some years past rarely became ripe in *England*, unless they grew against the best aspected walls, are now found to ripen extremely well on espaliers and dwarfs; and those Pears, which seldom were in eating till *January*, are ripe a month earlier. There is also a very great difference in their time of ripening in different seasons, for I have known the fruit of a Pear-tree in one year all ripe and gone by the middle of *October*, and the very next year the fruit of the same tree has not been fit to eat till the end of *December*, so that allowance should be made for these accidents. The Besi de Chaumontelle Pear, about forty years past, was seldom fit to eat before *February*, and has continued good till the middle of *April*; but now this Pear is commonly ripe in *November*, and when it is planted on a warm soil, and against a good aspected wall, it is in eating the middle of *October*. This forwarding of the several kinds of Pears, may be in some measure owing to the stocks upon which they are grafted; for if they are grafted upon early summer Pear-stocks, they will ripen much earlier than when they are upon hard Winter Pear-stocks; and if some of the very soft melting Pears were grafted upon such stocks as are raised from the most austere fruit, such as are never fit to eat, and of which the best Perry is made, it would improve those fruits, and continue them much longer good; or if the common free-stocks were first grafted with any of these hard Winter Pears, and when they have grown a year, then to

graft or bud these soft melting Pears upon them, it would have the same effect; but the Pears so raised, will require a year's more growth in the nursery, and consequently cannot be sold at the same price as those which are raised in the common method, these requiring to be twice budded or grafted, so that there is double labour, beside standing a full year longer; but this difference in the first expence of the trees, is not worth regarding by any person who is desirous to have good fruit; for the setting out in a right way is that which every one should be the most careful of, since by mistaking at first, much time is lost, and an after expence of new trees often attends it.

The ripening of these fruits may also be accelerated by the method of pruning and managing these trees, which are greatly improved within the space of a few years past; for if we look into the directions which are given by the best writers on this subject, we shall soon discover how little they knew sixty years ago, of the true method of pruning and managing all sorts of fruit-trees, scarce one of them making any difference in the management of the different kinds of fruit.

Pears are propagated by grafting or budding them upon stocks of their own kind, which are commonly called free-stocks, or upon Quince-stocks, or White-thorn, upon all which these fruits will take; but the latter sort of stock is now seldom used, because they never keep pace in their growth with the fruit budded or grafted upon them; as also because the fruit upon such stocks are commonly drier, and more apt to be stony, than when they are upon Pear-stocks. Quince-stocks are greatly used in the nurseries for all sorts of Pears which are designed for dwarfs or walls, in order to check the luxuriancy of their growth, so that they may be kept within compass better than upon free-stocks. But against the general use of these stocks, for all sorts of Pears indifferently, there are very great objections: 1st, Because some sorts of Pears will not thrive upon these stocks, but in two or three years decay, or at most will but just keep alive. 2dly, Most of the sorts of hard-breaking Pears, are rendered stony, and good for little; so that, whenever any of these sorts are thus injudiciously raised, the fruit, although the kind be ever so good, is condemned as good for nothing by such as are not well acquainted with it, when the fault is entirely owing to the stock, on which it was grafted. On the contrary, most melting buttery Pears are greatly improved by being upon Quince-stocks, provided they are planted on a strong soil; but, if the ground be very dry and gravelly, no sort of Pear will do well upon Quince-stocks in such places.

These general directions being given, there is no occasion to repeat any part of the method in which these stocks are raised, and the fruits budded or grafted thereon, which has been already mentioned under the article of *NURSERIES*.

The distance which these trees should be planted, either against walls or espaliers, must not be less than thirty feet, but, if they are planted forty feet, it will be better; for, if they have not room to spread on each side, it will be impossible to preserve them in good order, especially those on free-stocks, for the more these trees are pruned, the more they will shoot; and, as I said before, many sorts of Pears produce their blossom-buds first at the extremity of the former year's shoots; so that when they are shortened, the fruit will be cut away, and this cannot be avoided, where the trees have not room allowed in their first planting.

This distance, I doubt not, will be objected to by many who have not fully attended to the growth of these trees, especially as it hath been the general practice of most gardeners to plant these trees at less than half the distance which is here mentioned; but, whoever will be at the trouble to view any of these trees which have been some years

years standing, they will always find, if, by accident, one of these trees has been planted against a building, where the branches have had room to spread, that this tree has produced more fruit than twelve trees which have been crowded close, and have not room for their branches to extend. There are some Pear-trees now growing, which spread more than fifty feet in length, and are upward of twenty feet high, which produce a much greater quantity of fruit than three trees in the same room would have done, as there are examples enough to prove, where trees are planted against houses and the ends of buildings at about twelve feet, or much less distance, because there is height of walling for them to grow, which is the reason commonly given by those who plant these trees so close together. But one tree will bear more fruit, when the branches are trained horizontally, than three or four trees, whose branches are led upright; and there never can be any danger of the upper part of the wall being left naked or unfurnished, for I have seen a Pear-tree which has spread more than fifty feet in width, and covered the wall upward of thirty-six feet in height: this was a Summer Boncrétien Pear, and was extremely fruitful, which rarely happens to this sort when they are not allowed a large share of room. The finest tree of this sort of Pear, which I ever have seen, was a large standard-tree in my own possession, whose stem was not more than ten feet high, where the branches came out regularly, and extended near thirty feet on every side from the trunk, many of which were, by the weight of the fruit in summer, brought down to the ground, so were obliged to be supported with props toward the extremity of the branches, to prevent their lying upon the ground; and this tree had its branches so disposed, as to form a natural parabola of forty feet in height, bearing from the lowest to the highest branches; so that in a kindly season, when the blossoms escaped the frost, it hath produced upward of two thousand Pears, which were much better flavoured than any of the same sort which I have yet tasted. This instance I mention only to shew how much one of these trees will spread, if proper room be allowed it, and also to observe that, as the branches of this tree had never been shortened, they were fruitful to their extremities. This shews the absurdity of the *French* gardeners, who do not allow more than ten or twelve feet distance to these trees; and some of their most improved writers on this subject have advised the planting an Apple-tree between the Pear-trees, where they are allowed twelve feet, and yet these authors afterward say, that a good Pear-tree will shoot three feet each way in one year; therefore, according to their own observation, the trees so planted will have their branches meet together in two or three years at most; and what must be the case with such trees in five or six years, is not difficult to know. But this method of planting has not been peculiar to the *French*, for most of the gardens in *England* have been little better planted. Indeed, those persons who were intrusted with the making and planting most of the *English* gardens, had little skill of their own, so were obliged to follow the directions of the *French* gardeners, of whom they had so great an opinion, as to get their books translated, and to these have added some trifling notes, which rather betray their weakness; for, where they have objected to the little room which their authors had allowed to these trees, they have, at the most, allowed them but three feet more, from which it is plain, they had not considered the natural growth of the trees, and whoever departs from nature, may be justly pronounced an unskillful gardener.

As most of the *English* gardens have been made and planted by persons of little judgment, it is very rare to find any of them which produce much fruit, for although many of these gardens have been totally altered, and new-planted, yet

they have seldom been much altered for the better, and the possessors have been put to the expence of removing the old trees, also the earth of their borders, and to purchase new trees, which have been planted perhaps a foot or two farther asunder than the old trees, which were removed; so that, when the young trees have grown a few years, they were in the same condition as the old, and it will be the loss of so many years to the owner; but this will constantly be the case, when it is the interest of the persons employed, who can sell so many young trees, and the planting of three times the number of trees in a garden, more than is proper, may in some measure be ascribed to the same, though in many instances I should be inclinable to think it has proceeded from ignorance, rather than design.

But where fruit-trees have been thus injudiciously planted, if the stocks are healthy and good, the best way to recover this loss is to dig up two or three, and leave every third or fourth tree, according to the distance which they were planted, and spread down the branches of those which are left horizontally, I mean, all such as are capable of being so brought down; but those, which are too stubborn for this, should be cut off near the stem, where there will be new shoots enough produced to furnish the wall or espalier; and, if the sort of fruit is not the same as desired, the young branches may be budded the same summer, or grafted the following spring with any other sort of Pear, and hereby many years may be saved; for one of these old trees will spread to a much greater length, and produce more fruit, when thus managed, in three years, than a new tree will in ten or twelve, especially if the ground is mended. This is a method which I have practised with great success, where I have been employed to amend the blunders of these great gardeners, as they are stiled, and hereby the walls and espaliers have been well furnished in a few years.

But the next thing to be done, after being furnished with proper trees, is the preparing of the ground to receive them; in the doing of which, there should be great regard had to the nature of the soil, where the trees are to grow; for, if it is a strong stiff land, and subject to wet in the winter, the borders should be raised as much above the level of the ground as you conveniently can. And if under the good soil there is a sufficient quantity of lime rubbish, or stones laid to prevent the roots of the trees from running downward, it will be of great service to them. The borders for these should not be less than eight feet broad, but, if they are twelve, it will be still better. And as these borders may be planted with such sorts of esculent plants as do not grow large, or whose roots do not run deep, or mat together on the surface, these will do no harm to the Pear-trees, for these are not so nice in their culture as Peach and Nectarine-trees; so the turning of the ground, and mending it for these crops, will rather improve than injure the trees, provided the plants do not shade the trees, or are not suffered to stand too long upon the borders. But all the Cabbage kind, as also Beans, should be excluded from these borders, because they root deep in the ground, and draw much nourishment from the trees.

But if the soil is shallow, and the bottom is either gravel or chalk, there must be a sufficient depth of good earth laid upon the borders, so as to make them two feet and a half deep; for, if the ground is not of this depth, the trees will not thrive well. And, in doing of this, I must caution every person not to dig out the gravel in a trench (as is by some practised), and fill this trench with good earth, for by so doing, when the roots of the trees are extended to the width of the trench, they will meet with the gravel which will stop them so, that they will be confined, as if they were in tubs of earth, whereby the trees will be soon spoiled; therefore, when the gravel or chalk is removed, it

should be entirely taken away over the whole garden, otherwise it will be better to raise the whole border above it.

If the garden is to be new-made from a field, then all the good earth on the surface should be carefully preserved, and, if the good ground is taken out where the walks are designed to be made, and laid upon the borders, or in the quarters, it will add to the depth of the soil, and save expence in bringing in of new earth. If the ground can be prepared one year before it is planted, the trees will thrive the better, for by laying the ground in ridges, and turning it over two or three times, it will loosen the soil, and render it much better for planting; but in trenching, or ploughing of the ground, there should be great care taken not to go deeper than the ground is good, otherwise all the good soil will be buried below the roots, and the bad ground will be turned on the top, which is what I have known done at a great expence by persons, who have been at the top of their profession, and have thereby entirely ruined the gardens.

Where there is a necessity of bringing in any fresh earth for the borders, it will be proper to do it as soon as possible, and to mix this with the surface of the earth of the borders, that it may be turned over two or three times, that the parts may be well mixed and incorporated before the trees are planted; and, if some very rotten dung is added to this, it will greatly improve it. In choosing of the earth, which is to be brought into the garden, there should be this care, *viz.* That if the natural soil of the garden is light and dry, then the new earth should be loamy and stiff; but where the natural soil is strong or loamy, then the new earth should be light and sandy, which will loosen the parts of the natural soil, and greatly mend it.

There are some persons who recommend the laying the whole depth of the borders with what they call Virgin-earth, that is, such as is taken from a pasture where the land has not been ploughed; but if this is not brought into the garden at least one year before the trees are planted, that by turning it over often it may be sweetened, it will not be so good as that which is taken from a kitchen-garden, where the land is good, and has been well wrought, for by often turning and breaking of the soil, it will be the better prepared to receive the trees.

Others recommend the mixing a great quantity of rotten dung with the earth of the borders; but this is not so proper, for, by making of the ground too rich, it will only encourage the luxuriant growth of the trees; therefore it is always better to mend the borders from time to time as they may require, and not to add so much dung in the first making them.

Another care is required in the making of the borders on wet ground, which is to contrive some covered drains to convey off the water in winter, otherwise, by this being detained about the roots of the trees, it will greatly prejudice them; and in the building of the walls round a kitchen-garden, where the ground is inclinable to be wet, there should be some arches turned in the foundations of those walls, which are in the lowest part of the garden, to let off the wet.

The manner of preparing these trees for planting is the same as hath been directed for other fruit-trees, *viz.* to cut off all the small fibres from the roots, and to shorten some of the longest roots, and cut off all the bruised ones, or such as shoot downright: this being done, you should plant them in the places intended at the before-mentioned distance. The best time to plant these trees (if upon a middling or dry soil) is in *October* or *November*, leaving their heads on till spring, which should be fastened to the walls or stakes, to prevent the wind from disturbing their roots; and in the beginning of *March* their heads should be cut off in the

manner already directed for Peaches and other fruit-trees, observing also to lay some mulch upon the surface of the ground about their roots when they are planted, as hath been several times already directed for other trees, but in wet ground the trees may be planted in *February*, or the beginning of *March*, at any time before the buds are much swelled, but these may be cut down when they are planted.

The first summer after planting, the branches should be trained to a wall or espalier (against which they are planted) in a horizontal position, as they are produced, without shortening of them, and the *Michaels* following some of these shoots should be shortened down to five or six eyes, in order to obtain a sufficient quantity of branches, to furnish the lower part of the wall or espalier; but the shoots ought not to be shortened, unless where there is a want of branches to fill a vacancy, therefore the less the knife is used to these trees, the better they will succeed; for, whenever the shoots are stopped, it occasions the buds immediately below the cut to send forth two or more shoots, whereby there will be a confusion of branches, and rarely any fruit is produced with this management.

The distance which the branches of Pears should be trained, must be proportioned to the size of their fruit. Such sorts whose fruit are small, may be allowed five or six inches, but the larger sorts must not be less than seven or eight inches asunder. If this be duly observed, and the branches carefully trained horizontally as they are produced, there will be no occasion for much cutting these trees, which, instead of checking their growth, does, on the contrary, cause them to shoot the stronger.

It is very surprising to read the tedious methods which most of the writers on fruit-trees have directed for pruning of these trees, for, by their prolix and perplexed methods, one would imagine they had endeavoured to render themselves as unintelligible as possible; and this, I am sure, may be affirmed, that it is next to impossible for a learner ever to arrive at any tolerable skill in pruning by the tedious and perplexed directions which are published by *Monf. Quintiny*, and those who have copied from him; for, as these have all set out wrong in the beginning, by allowing their trees less than a third of the distance which they should be planted, they have prescribed rules to keep them within that compass, which are the most absurd, and contrary to all reason.

I shall therefore only lay down a few necessary directions for the pruning and managing of these trees, which shall be done in as few words as possible, that a learner may the more easily understand it, and which (together with proper observations) will be sufficient to any person in the right management of them.

Pear-trees generally produce their blossom-buds first at the extremity of the last year's shoots, so that, if these are shortened, the blossoms are cut off; but this is not all the damage, for (as I before said) this occasions the buds immediately below the cut to put forth two or more shoots, whereby the number of branches will be increased, and the tree crowded too much with wood; besides, those buds, which by this management produce shoots, would have only produced cufions and spurs, upon which the blossom-buds are produced, if the leading branch had not been shortened; therefore these should never be stopped, unless to furnish wood to fill a vacancy.

It is not necessary to provide a new supply of wood in Pear-trees, as must be done for Peaches, Nectarines, &c. which only produce their fruit upon young wood, for Pears produce their fruit upon cufions or spurs, which continue fruitful many years; so that, where these trees have been skilfully managed, I have seen branches which have been trained horizontally upwards of twenty feet from the trunk of

of the tree, and have been fruitful their whole length. And if we do but carefully observe the branches of a healthy standard-tree, which has been permitted to grow without pruning, we shall find many of these spurs that are ten or twelve years old or more, which are very full of blossom-buds, and produce a good number of fruit annually.

During the summer season these trees should be often looked over to train the shoots, as they are produced, regularly to the wall or espalier, and to displace fore-right and luxuriant branches as they shoot out, whereby the fruit will be equally exposed to the air and sun; which will render them more beautiful and better tasted than when they are shaded by the branches; and by thus managing the trees in summer, they will always appear beautiful, and in winter they will want but little pruning.

Where Pear-trees are thus regularly trained without stopping of their shoots, and have full room for their branches to extend on each side, there will never be any occasion for disbarking of the branches, or cutting off the roots (as hath been directed by several writers on gardening); which methods, however they may answer the intention for the present, yet will certainly greatly injure the trees, as must all violent amputations, which should be ever avoided, as much as possible, on fruit-trees; and this, I am sure, can never be wanted, where trees have been rightly planted, and regularly trained, while young.

The season for pruning of these trees is any time after the fruits are gathered, until the beginning of *March*, but the sooner it is done after the fruit is gathered, the better, for reasons already given for pruning of Peach-trees; though indeed the deferring of these until spring, where there are large quantities of trees to prune, is not so injurious to them, as to some tender fruits; but, if the branches are regularly trained in the summer, and the luxuriant shoots rubbed off, there will be little left to do to them in winter.

All the sorts of summer Pears will ripen very well either on standards, dwarfs, or espaliers, as will all autumn Pears upon dwarfs or espaliers; but, where a person is very curious in his fruit, I would always advise the planting them against espaliers, in which method they take up less room in a garden, and, if they are well managed, appear very beautiful, the fruit larger and better tasted than those produced on dwarfs, as hath been already observed; but some of the winter Pears must be planted against east, south-east, or south-west walls, otherwise they will not ripen well in *England* in bad seasons.

But although this may be the case with some of the late winter Pears in very bad seasons, yet, in general, most sorts of them will ripen extremely well in all warm situations, when they are planted in espalier, and the fruit will be better flavoured than that which grows against walls, and will keep much longer good; for, as the heat against walls, which are exposed to the sun, will be very great at some times, and at others there will be little warmth, all fruit, which grow near them, will be hastened unequally, and therefore is never so well flavoured as the same sorts are which ripen well in the open air; and all the fruit, which is ripened thus unequally, will decay much sooner than those which ripen gradually in the open air; therefore those winter Pears, which grow in espalier, may be kept six weeks longer than those which grow against walls, which is a very desirable thing; for to have plenty of these fruit, at a season when it is very rare to find any other fruit to supply the table but Apples, is what all lovers of fruit must be greatly pleased to enjoy, which is what may be effected by planting many of the late sorts in espalier, where, although the fruit will not be so well coloured as those from the walls, yet they will be found exceeding good. When the *Besi de Chaumontelle* came first to *England*, the trees

were planted in espalier, and some of them not on a very good soil, or in a warm situation, and yet from these trees I have eaten this Pear in great perfection in *April*, and sometimes it has kept till *May*; whereas, all those which have been since planted against walls ripen their fruit by the beginning of *November*, and are generally gone by the middle of *December*, nor are the latter so well tasted as those off the espaliers.

The *Virguleuse*, and *St. Germain*, as also the *Colmar*, are esteemed the most difficult sorts to ripen their fruit, yet these I have eaten in great perfection from espaliers, and often from standard-trees, where they grew upon a warm soil, but the fruit was much smaller on the standard-trees than those of the same sorts which grew against walls or espaliers, but they were full as well flavoured; and some of these sorts I have eaten good in *April*, which is two months later than they usually keep; but yet I would not advise the planting of these late Pears in standard-trees, because they should hang very late on the trees in autumn, at which season the winds are generally very high; and these standard-trees being much exposed, the fruit is often blown off the trees before they are ripe, and those of them, which may hang on the trees, are frequently bruised by being forced against the branches by the winds, so that they seldom keep well. What I mentioned this for, is to prove that these Pears will ripen very well without the assistance of a wall; so that, if they are planted in espaliers, where the trees are kept low, the fruit will not be so much exposed to the strong winds in autumn as those on the standards, therefore can be in no danger of the fruit coming to perfection; and, as the trees in espaliers will be constantly pruned, and managed in the same manner as those against walls, the fruit will be as large on those trees; therefore, where a person has a warm situation, and a kindly soil, I would not advise the being at an expence to build walls on purpose for Pears, but to plant them against espaliers, and, where there is any one who is very curious to have plenty of these fruit, and will be at the expence to procure them, I should advise the having a sufficient quantity of Reed-mats made to fix up against the back of the espalier in the spring, when the trees are in blossom, which will screen them from cold winds, and preserve the tender fruit until they are past danger, when the Reeds may be taken down, and put under a shed to preserve them from the weather; and, if the autumn should prove bad, these Reeds may be fixed up again, which will forward the ripening of the fruit, and also prevent the winds from blowing down, and bruising of it. These Reeds may be purchased for one Shilling per yard, running measure, at six feet and a half high, and, if they are carefully laid up, and kept from the weather, these Reeds will last seven or eight years, so that the expence will not be very great, and, when the advantages which these are of to the fruit are considered, I believe no person will object to the use of them.

But after the fruit is set and growing, there will be farther care necessary in order to have the fruit good, for it is not enough to have preserved a good crop of fruit on the trees, and then leave them entirely to nature during the season of their growth, but there will require some skill and attendance on the trees to help nature, or supply the deficiency of the seasons; for beside the pruning and training of the trees in the manner before directed, there will also be wanting some management of their roots according to the nature of the soil, and the difference of seasons. In all strong land, where the ground is apt to bind very hard in dry weather, the surface of the borders should be now and then forked over to loosen the earth, which will admit the showers and large dews to penetrate and moisten the ground, and be of great service to the trees and fruit, and also pre-

vent the growth of weeds. And if the soil is light and dry, and the season should prove hot and dry, there should be large hollows made round the stems of the trees to hold water; into each of these there should be poured eight or nine pots of water, which should be repeated once in a week, or ten days, during the months of *June* and *July*, if the season should continue dry. There should also be some mulch laid over the surface of these hollows to prevent the sun and air from drying the ground. Where this is practised, the fruit will be kept constantly growing, and prove large and plump; whereas, if this is omitted, the fruit will often be small, grow crooked, crack, and fall off from the trees. For if the fruit is once stinted in their growth, and rain should fall plentifully after, it will occasion a great quantity of the fruit to fall off the trees; and those which remain to ripen, will not keep so long as those which never receive any check in their growth; it is from this cause, that some years the fruit in general decays before the usual time. For after it has been for some time stinted in its growth, and then the season proves favourable, whereby it receives a sudden growth, it becomes so replete with juice, as to distend the vessels too suddenly, so that they will not be firm, which occasions their decay; therefore it is always best to keep the fruit constantly in a growing state, whereby it will acquire a proper size, and be rendered better flavoured.

There will also be required some dressing to the ground near the fruit-trees, but this should be laid on in autumn, after the trees are pruned. This dressing should be different, according to the nature of the soil; if the land is warm and dry, then the dressing should be of very rotten dung, mixed with loam; and if this is mixed six or eight months before it is laid upon the borders, and three or four times turned over, it will be the better; as will also the mixture, if it is made with neats or hogs-dung, both which are colder than horse-dung, so more proper for hot land. But in cold stiff land, rotten horse-dung, mixed with light sandy earth, or sea-coal ashes, will be the most proper, as this will loosen the ground, and add a warmth to it.

These dressings should be repeated every other year, otherwise the trees will not thrive so well, nor will the fruit be so good. For, notwithstanding what many persons have advanced to the contrary, yet experience is against them, for the finest fruit in *England*, both as to size and flavour, is produced on land which is the most dunged and worked. Therefore I would advise the trenching of the ground about the fruit-trees very well every winter, for I am sure it will be found to answer their expectations, who will practise this method. And where the ground in the quarters is well dressed and trenched, the fruit-trees will partake of the benefit, for as the trees advance in their growth, so their roots are extended to a great distance from their stems; and it is chiefly from the distant roots that the trees are supplied with their nourishment, therefore the dressing of the borders only, will not be sufficient for fruit-trees which are old.

In the gathering of Pears, great regard should be had to the bud which is formed at the bottom of the foot-stalk, for the next year's blossoms, which, by forcing off the Pear before it be mature, is many times spoiled; for while the fruit is growing, there is always a bud formed by the side of the foot-stalk upon the same spur, for the next year's fruit; so that when the Pears are ripe, if they are gently turned upward, the foot-stalk will readily part from the spur, without injuring of the bud.

The season for gathering all-summer Pears is just as they

ripen, for none of these will remain good above a day or two after they are taken from the tree; nor will many of the autumn Pears keep good above ten days or a fortnight, after they are gathered. But the winter fruits should hang as long upon the trees as the season will permit, for they must not receive the frost, which will cause them to rot, and render their juices flat and ill tasted; but if the weather continue mild until the end of *October*, it will then be a good season for gathering them in, which must always be done in dry weather, and when the trees are perfectly dry.

In the doing of this, you ought carefully to avoid bruising them, therefore you should have a broad flat basket to lay them in as they are gathered; and when they are carried into the store-room, they should be taken out singly, and each sort laid up in a close heap on a dry place, in order to sweat, where they may remain for ten days or a fortnight, during which time the windows should be open to admit the air, in order to carry off all the moisture which is perspired from the fruit; after this, the Pears should be taken singly, and wiped dry with a woollen cloth, and then packed up in close baskets, observing to put some Wheat-straw in the bottoms, and round the sides of the baskets, to prevent their bruising against the baskets. And if some thick soft paper is laid double or treble all round the basket, between the Straw and the Pears, this will prevent the Pears from imbibing the musty taste which is communicated to them by the Straw, when they are contiguous; which taste often penetrates through the skin so strongly, that when the fruit is pared, the taste will remain. You should also observe to put but one sort of fruit into a basket, lest by their different fermentations they should rot each other; but if you have enough of one sort to fill a basket which holds two or three bushels, it will be still better. After you have filled the baskets, you must cover them over with Wheat-straw very close, first laying a covering of paper two or three times double over the fruit, and fasten them down; then place these baskets in a close room, where they may be kept dry and from frost; but the less air is let into the room, the better the fruit will keep. It will be very necessary to fix a label to each basket, denoting the sort of fruit therein contained, which will save the trouble of opening them, whenever you want to know the sorts of fruit; besides, they ought not to be opened before their season to be eaten; for the oftener they are opened, and exposed to the air, the worse they will keep. I don't doubt but this will be objected to by many, who imagine fruit cannot be laid too thin; for which reason, they make shelves to dispose them singly upon, and are very fond of admitting fresh air, whenever the weather is mild, supposing it very necessary to preserve the fruit; but the contrary of this is found true, by those persons who have large stocks of fruit laid up in their storehouses in *London*, which remain closely shut up for several months, in the manner before related; and when these are opened, the fruit is always found plumper and sounder than any of those fruits which were preserved singly upon shelves, whose skins are always shrivelled and dry. For (as Mr. *Boyle* observes) the air is the cause of putrefaction; and, in order to prove this, that honourable gentleman put fruits of several kinds into glasses where the air was exhausted, in which places they remained sound for several months, but, upon being exposed to the air, rotted in a very short time, which plainly shews the absurdity of the common method now used, to preserve fruit.

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QUAMOCLIT. See Ipomœa.
QUERCUS. Tourn. Inst. R. H. 582. tab. 349.
 The Oak-tree.

The Characters are,

It hath male and female flowers on the same tree; the male flowers are disposed in a loose catkin. The female flowers, which sit close to the buds, have a hemispherical thick empalement of one leaf, which is rough and entire, almost hiding the flower, which has no petal, but a small oval germen, supporting a single five-pointed style, crowned by single permanent stigmas. The germen after-ward becomes an oval Nut (or Acorn) with a thick cover, having one cell, whose base is fixed into the empalement or cup.

The Species are,

1. *QUERCUS foliis deciduis oblongis, supernè latioribus sinibus acutioribus, angulis obtusis petiolatis glandibus sessilibus.* Oak with oblong deciduous leaves, broader toward the top, having acute indentures, with obtuse angles, which have foot-stalks, and acorns sitting close to the branches; or common Oak.

2. *QUERCUS foliis deciduis oblongis obtusis, pinnato-sinuatis petiolis brevissimis, pedunculis glandorum longissimis.* Oak with oblong, obtuse, deciduous leaves, which are winged-sinuuated, very short foot-stalks, with a fruit growing upon long foot-stalks.

3. *QUERCUS foliis oblongis sinuatis obtusis perennantibus, pedunculis glandorum longissimis.* Oak with oblong, obtuse, indented leaves, which are ever-green, having very long foot-stalks to the Acorns; or broad-leaved ever-green Oak.

4. *QUERCUS foliis oblongis obtusè-sinuatis, setaceo mucronatis sessilibus, glandibus majoribus.* Oak with oblong, obtusely indented leaves, which have bristly points, and sit close to the stalks, with larger Acorns.

5. *QUERCUS foliis oblongis pinnato-sinuatis, subtus tomentosis, glandibus sessilibus calycibus tomentosis.* Oak with oblong wing-indented leaves, which are downy on their under side, and Acorns having woolly cups sitting close to the branches.

6. *QUERCUS humilis, foliis oblongis obtusè dentatis, fructibus sessilibus conglomeratis.* Dwarf Oak with oblong, obtusely indented leaves, and fruit growing in clusters, sitting close to the branches; or dwarf Oak.

7. *QUERCUS foliis oblongis lyrato pinnatifidis, laciniis transversis acutis, subtus subtomentosis.* Lin. Sp. Plant. 997. Oak with oblong leaves, which are lyre-shaped, wing-pointed and have transverse acute jags, which are somewhat downy on their under side.

8. *QUERCUS foliis pinnato-sinuatis lævibus, fructibus sessilibus.* Prod. Leyd. 80. Oak with smooth wing-indented leaves, and fruit sitting close to the branches; commonly called the cut-leaved Italian Oak.

9. *QUERCUS foliis ovato-oblongis glabris, serrato repandis.* Lin. Sp. Plant. 996. Oak with oblong, oval, smooth, sawed leaves, and reflexed indentures.

10. *QUERCUS foliis obtusè-sinuatis setaceo-mucronatis.* Lin. Sp. Plant. 996. Oak with obtuse sinuated leaves, terminated by bristly points.

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11. *QUERCUS foliis obovatis utrinque acuminatis sinuato-serratis, denticulatis rotundatis uniformibus.* Hort. Cliff. 448. Oak with oblong oval leaves, which are pointed on both sides, and have sawed sinuses with uniform roundish indentures; the American Chestnut-leaved Oak.

12. *QUERCUS foliis cuneiformibus obsolete trilobis.* Flor. Virg. 117. Oak with wedge-shaped leaves, having three worn-out lobes; the Black Oak.

13. *QUERCUS foliorum sinibus obtusis, angulis acutis setâ-terminatis, intermediis vix tridentatis margine integerrimo.* Hort. Cliff. 448. Oak with obtuse sinuses to the leaves, and acute angles terminated by bristles, and an entire border; the Scarlet Oak of Virginia.

14. *QUERCUS foliis obliquè pinnatifidis, sinibus angulisque obtusis.* Lin. Sp. Plant. 996. Oak with oblique many-pointed leaves, having obtuse sinuses and angles; the White Oak of Virginia.

15. *QUERCUS foliis lineari-lanceolatis integerrimis glabris.* Oak with linear, spear-shaped, entire, smooth leaves; the Willow-leaved Oak.

16. *QUERCUS foliis oblongo-ovatis subtus tomentosis integerrimis.* Prod. Leyd. 81. Oak with oblong, oval, entire leaves, which are downy on their under side; the narrow-leaved ever-green Oak.

17. *QUERCUS foliis oblongo-ovatis sinuato-spinosis subtus tomentosis, glandibus pedunculatis.* Sauv. Monsp. 96. Ever-green Oak with oblong, oval, prickly, indented leaves, which are woolly on their under side, and bears Acorns with foot-stalks; or the Holly-leaved ever-green Oak.

18. *QUERCUS foliis ovatis indivisis spinoso-dentatis glabris.* Prod. Leyd. 80. Oak with oval, undivided, smooth leaves, which are prickly and indented; or the Kermes Oak.

19. *QUERCUS foliis lanceolato-ovatis integerrimis petiolatis sempervirentibus.* Oak with spear-shaped, oval, entire leaves, which are ever-green, and have foot-stalks; commonly called Live Oak in America.

20. *QUERCUS foliis ovato-oblongis indivisis serratis subtus tomentosis, cortice rimoso fungoso.* Hort. Cliff. 448. Oak with oval, oblong, undivided leaves, which are sawed and woolly on their under side, and have a fungous cleft bark; or Cork-tree.

The first sort here mentioned, is the most common Oak of this country, which is so well known as to need no description; the leaves of this, have pretty long foot stalks, and the Acorns have none, but sit close to the branches.

The second sort, is not so common here as the first, but in the wilds of Kent and Sussex I have seen many large trees of this kind. The leaves of this are not so deeply sinuated as those of the first, nor are they so irregular, but the indentures are opposite, like the lobes of winged leaves; these have scarce any foot-stalks, but sit close to the branches; the Acorns stand upon very long foot stalks, in which they differ from the common sort. The timber of this sort is accounted better than that of the first, and the trees when growing have a better appearance. These have been generally supposed to be seminal varieties, which have accidentally.

tally come from Acorns of the same tree; I was long of this opinion myself, but having lately seen some young trees with Acorns upon them, which were raised from Acorns of the second sort, and finding they retain their difference, I am inclined to believe they are different.

The third sort grows upon the *Apennines*, and also in *Savabia* and *Portugal*. The leaves of this are broader and not so deeply sinuated as those of the common Oak; they are of a lighter green on their upper side, but pale on their under; they have very short foot-stalks, their points are obtuse, and the Acorns have very long foot-stalks, which frequently sustain three or four growing in a cluster.

The fourth sort grows common in some parts of *France*, where it rises to be a tall stately tree. The leaves are oblong and obtusely sinuated, each sinus being terminated by a bristly point; the Acorns are larger than those of the common Oak.

The fifth sort grows in the south of *France* and in *Italy*. The leaves of this are shorter and broader than those of the common Oak, and are regularly indented on their sides, the indentures being opposite, but not deep; they are of a light green on their upper side, and are covered with a soft down on their under, standing upon short foot-stalks; the Acorns grow in clusters, sitting close to the branches; their cups are covered with a white down.

The sixth sort grows in the south of *France* and in *Italy*. This is a low bushy Oak, which rises but six or seven feet high, sending out many slender branches, garnished with oblong leaves, which are obtusely indented, standing upon slender foot-stalks; the Acorns are small, and grow in clusters, and the galls grow three or four together.

The seventh sort grows in *Burgundy*. The leaves of this are oblong and pointed, and are frequently indented in the middle like a lyre; they are jagged and acute-pointed, a little hoary on their under side, standing upon slender foot-stalks. The Acorns are small, and have rough prickly cups.

The eighth sort grows naturally in *Spain* and *Italy*. The leaves of this tree are smooth; they are deeply sinuated like winged leaves; some of the sinuses are obtuse, and others end in acute points; they have very short foot-stalks; the branches are covered with a purplish bark when young; the Acorns are long and slender, the cups rough and a little prickly, sitting close to the branches. The Acorns of this sort are sweet, and are frequently eaten by the poor in the south of *France*, who in times of scarcity grind them and make bread with the flour.

The ninth sort grows naturally in the *Levant*, from whence the Acorns are annually brought to *Europe*, where they are used for dyeing; these are called *Velani*, and the tree *Velanida* by the *Greeks*. It is one of the fairest species of Oak in the world; the trunk of this rises as high as the common Oak; the branches extend very wide on every side, and are covered with a grayish bark, intermixed with brown spots; they are closely garnished with oblong oval leaves, which are deeply sawed on their edges; most of the saws or teeth turn backward, and terminate in acute points. The leaves are stiff, of a pale green on their upper side, and on their under side are a little downy; the Acorns have very large scaly cups, which almost cover them; the scales are ligneous and acute-pointed, standing out a quarter of an inch; some of the cups are as large as middling Apples.

The tenth sort grows naturally in *Virginia*, and in other parts of *North America*. This is a large tree in the countries where it naturally grows; the bark is smooth, of a grayish colour, but that of the younger branches is darker; the leaves are long and broad; they are obtusely sinuated, each sinus ending with a bristly point, of a bright green, standing upon short foot-stalks. The leaves continue their verdure very late in autumn, so that unless hard frost comes

on early, they do not fall till near *Christmas*, nor do they change their colour long before. The Acorns of this sort are a little longer, but not so thick as those of the common Oak.

The eleventh sort grows naturally in *North America*. Of this there seems to be two kinds, one of which grows to a much larger size than the other, though this may be occasioned by the soil in which they grow; for the largest sort grows in the rich low lands, where it becomes the largest tree of any of the Oaks in those countries. The wood is not of a fine grain, but is very serviceable; the bark is gray and scaly; the leaves are long and broad, indented on the edges, and have many transverse veins running from the midrib to the borders; they are of a bright green, and so nearly resemble those of the Chestnut-tree, as scarcely to be distinguished from it. The Acorns of this sort are very large, and their cups are short. The leaves of the other variety are not so large, nor so strongly veined, and the Acorns are smaller and a little longer, which may arise from the soil.

The twelfth sort grows naturally on poor land in most parts of *North America*; this never grows to a large size, and the wood is of no value. The bark is of a dark brown colour; the leaves are very broad at the top, where they have two waved indentures, which divide them almost into three lobes; they diminish gradually to their base, where they are narrow; they are smooth, of a lucid green, and have short foot-stalks. The Acorns are smaller than those of the common Oak, and have short cups.

The thirteenth sort grows naturally in *North America*, where it is called the Red Oak, from the leaves changing to a deep red or purple before they fall off. There has been supposed two sorts of this Oak, but I believe they are only femal varieties; for from the Acorns of the same tree, I have seen plants raised, whose leaves have been of very different shapes and sizes, and have varied greatly in their colour in autumn, some changing to a bright red or scarlet, and others to a deep purple colour. The wood is soft, spongy, and not durable. The Acorns of this sort also vary in size and shape; some of them are smaller, and others shorter and larger than those of the common Oak.

The fourteenth sort grows naturally in *North America*, where the wood is esteemed preferable to any of their other sorts for building, being much more durable than any of them. The bark of this tree is grayish; the leaves are long and broad, and are regularly indented almost to the midrib; the indentures are obtuse; they are of a light green, and have short foot-stalks. The Acorns of this greatly resemble those of the common Oak.

The fifteenth sort grows naturally in *North America*, where they distinguish two sorts; one of them is called the *Highland Willow Oak*, which grows upon poor dry land; the leaves are of a pale green and entire, shaped like those of the Willow-tree. The Acorns are very small, but have pretty large cups.

The other grows in low moist land, and rises to a much greater height; the leaves are longer and narrower, and the Acorns are of the same size and shape, so that I suspect their difference is owing to the soil in which they grow.

The sixteenth sort is generally known by the title of *Ilex*, or ever-green Oak. Of this there are several varieties, which differ greatly in the size and shape of their leaves; but these will all arise from Acorns of the same tree, as I have several times experienced; nay, the lower and upper branches of the same tree are frequently garnished with leaves, very different in size and shape from each other. The leaves are entire, of a lucid green on their upper side, but whitish and downy on their under, standing upon pretty long foot-stalks; these remain green all the year, and do not fall till they are thrust off by young leaves in the spring.

The Acorns are smaller than those of the common Oak, but of the same shape.

The seventeenth sort is supposed to be a different sort. The leaves are shorter and broader than the other, approaching in shape to those of the Holly-tree, and are set with prickles on their edges.

The eighteenth sort is the Oak, from which the Kermes, or what is called Scarlet Grain, is collected, which is an insect that harbours on this tree. It grows naturally in *Provence* and *Languedoc*, where it is known by the title d'Avaux. This is of small growth, seldom rising above twelve or fourteen feet high, sending out branches on every side, so as to form a bushy shrub; the leaves are oval and undivided; they are smooth on their surface, but indented on their edges, which are armed with prickles like those of the Holly-tree. The Acorns are smaller than those of the common Oak.

The nineteenth sort grows naturally in *Carolina* and *Virginia*, where it rises to the height of forty feet. The Grain of the wood is hard, tough, and coarse; the bark is grayish; the leaves are entire, ovally spear-shaped, and of a dark green, of a thick consistence, and continue green all the year. The Acorns are small, oblong, and have short cups; they are very sweet, so are eaten by the *Indians*, who lay them up in store for the winter; they also draw a very sweet oil from them, little inferior to that of sweet Almonds. This is called the Live Oak in *America*.

The twentieth sort is the tree whose bark is the cork. Of this there are two or three varieties, *viz.* one with a broad, another with a narrow leaf, which are ever-green; and there is one or two which cast their leaves in autumn, but the broad-leaved ever-green is the most common; the other may probably be only a variety, arising by accident. The leaves of this are oblong, oval, undivided, sawed on their edges, and have a little down on their under sides; their foot-stalks are very short; the leaves continue green through the winter till the middle of *May*, when they generally fall off just before the new leaves come out, so that the trees are very often almost bare for a short time. The Acorns are very like those of the common Oak.

The exterior bark of this tree is the cork; this is taken off from the trees every eight or ten years, but there is an interior bark which nourishes the trees, so that the stripping off the outer, is so far from injuring them, that it is necessary to continue the trees, for those whose bark are not taken off, seldom last longer than fifty or sixty years in health; whereas the trees, which are barked every eight or ten years, will live a hundred and fifty years or more. The bark of the young trees is porous and good for little, however it is necessary to take it off when the trees are twelve or fifteen years old, without which the bark will not be good, and after eight or ten years the bark will be fit to take off again; but this second peeling is of little use, but the third peeling the bark will be in perfection, and will continue so many years, for the best cork is taken from the old trees. The time of year for stripping off this bark is in *July*, when the second sap flows plentifully. This is performed with an instrument, like that used for disbarking Oaks.

All the sorts of Oaks are propagated by sowing their Acorns; the sooner they are put into the ground after they are ripe, the better they will succeed; for they are very apt to sprout where they are spread thin, and if they are laid in heaps, they ferment and rot in a little time; therefore the best season for sowing them is in *October*, by which time they will be fallen from the trees.

Where Oak trees are cultivated with a view to profit, the Acorns should be sown where the trees are designed to grow, for those which are transplanted, will never arrive to the size of those which stand where they are sown, nor

will they last near so long sound. For in some places, where these trees have been transplanted with the greatest care, and have grown very fast for several years after, yet are now decaying, when those which remain in the place where they came up from the Acorns, are still very thriving, and have not the least sign of decay. Therefore, whoever designs to cultivate these trees for timber, should never think of transplanting them, but sow the Acorns on the same ground where they are to grow; for the timber of all those trees which are transplanted, is not near so valuable as that of the trees from Acorns. I shall give some plain directions for the sowing of Acorns, and managing of the young trees during their minority, until they are out of danger, and require no farther care.

The first thing to be done is, that of fencing the ground very well, to keep out cattle, hares, and rabbits; for if either of these can get into the ground, they will soon destroy all the young trees. Indeed they will in a few years grow to be out of danger from the hares and rabbits, but it will be many years before they will be past injury from cattle, if they are permitted to get into the plantation, therefore durable fences should be put round the ground: if in the beginning a pale fence is made about the land, which may be close at the bottom and open above, and within the pale a quick hedge planted; this will become a good fence by the time the pale decays, against all sorts of cattle, and then the trees will have got above the reach of hares and rabbits, so that they cannot injure them, for the bark of the trees will be too hard for them to gnaw.

After the ground is well fenced, it should be prepared, by ploughing of it three or four times, and after each ploughing to harrow it well, to break the clods, and cleanse the ground from couch, and the roots of all bad weeds. Indeed if the ground is green sward, it will be better to have one crop of Beans, Peas, or Turneps, off the ground, before the Acorns are sown, provided these crops are well hoed, to stir the surface and destroy the weeds; for if this is observed, the crop will mend and improve the land for sowing; but in this case the ground should be ploughed as soon as possible, when the crop is taken off, to prepare it for the Acorns, which should be sown as soon as may be after they are ripe; for although they may be preserved in sand for some time, yet they will be apt to sprout; and if so, the shoots are in danger of being broken and spoiled; therefore I should advise the sowing early, which is certainly the best method.

In making choice of the Acorns, all those should be preferred, which are taken from the largest and most thriving trees; and those of Pollard-trees should always be rejected, though the latter are generally the most productive of Acorns, but those of the large trees commonly produce the strongest and most thriving plants.

The season for sowing of the Acorns being come, and the ground having been ploughed and harrowed smooth, the next work is to sow the Acorns, which must be done by drawing of drills across the ground, at about four feet asunder, and two inches deep, into which the Acorns should be scattered at two inches distance. These drills may be drawn either with a drill-plough, or by hand with a hoe; but the former is the most expeditious method, therefore in large plantations should be preferred. In the drawing of the drills, if the land has any slope to one side, these should be made the same way as the ground slopes, that there may be no stoppage of the wet by the rows of plants crossing the hanging of the land. This should be particularly observed in all wet ground, or where the wet is subject to lie in winter, but in dry land it is not of much consequence. When the Acorns are sown, the drills should be carefully filled in, so as to cover the Acorns securely;

for if any of them are exposed, they will entice the birds and mice, and if either of these once attack them, they will make great havock with them.

The reason of my directing the drills to be made at this distance, is for the more convenient stirring of the ground between the rows, to keep the young plants clear from weeds; for if this is not carefully done, it cannot be expected that the young plants should make much progress; and yet this is generally neglected by many who pretend to be great planters, and are often at a large expence to plant, but seldom regard them after; so that the young plants have the difficulty to encounter the weeds, which frequently are four or five times the height of the plants, and not only shade and draw them, but also exhaust all the goodness of the ground, and consequently starve the plants. Therefore, whoever hopes to have success in their plantations, should determine to be at the expence of keeping them clean for eight or ten years after sowing, by which time the plants will have obtained strength enough to keep down the weeds; the neglecting of this has occasioned so many young plantations to miscarry, as are frequently to be met with in divers parts of *England*.

About the middle of *April*, the young plants will appear above ground; but before this, if the ground should produce many young weeds, it will be good husbandry to scuffle the surface over with *Dutch* hoes, in a dry time, either the latter end of *March* or the beginning of *April*, to destroy the weeds, whereby the ground will be kept clean, until all the plants are come up, so as to be plainly discerned, by which time it may be proper to hoe the ground over again; for by doing it early, while the weeds are small, a man will perform more of this work in one day, than he can in three or four when the weeds are grown large; besides, there will be great hazard of cutting off or injuring the young plants, when they are hid by the weeds, and small weeds being cut, are soon dried up by the sun; but large weeds often take fresh root and grow again, especially if rain should fall soon after, and then the weeds will grow the faster for being stirred; therefore it is not only the best method, but also the cheapest husbandry, to begin cleaning early in the spring, and to repeat it as often as the weeds are produced.

The first summer, while the plants are young, it will be the best way to perform these hoeings by hand, but afterward it may be done with the hoe-plough; for as the rows are four feet asunder, there will be room enough for this plough to work; and as this will stir and loosen the ground, it will be of great service to the plants; but there will require a little land labour where the plough is used, in order to destroy the weeds, which will come up in the rows between the plants; for these will be out of the reach of the plough, and if they are not destroyed, they will soon overgrow and bear down the young plants.

After the plants have grown two years, it will be proper to draw out some of them, where they grow too close; but in the doing of this, great care should be had not to injure the roots of those left, for as the plants, which are drawn out, are only fit for plantations designed for pleasure, so these should not be so much regarded in their being removed, as to sacrifice any of those which are designed to remain. In the thinning of these plantations, the plants may at the first time be left about one foot asunder, which will give them room enough to grow two or three years longer, by which time it may be easy to judge which are likely to make the best trees. Therefore these may be then fixed on as standards to remain, though it will be proper to have a greater number at this time marked than can be permitted to grow, because some of them may not answer the expectation; and as it will be improper to thin

these trees too much at one time, so the leaving double the number intended at the second thinning, will not be amiss. Therefore, if they are then left at about four feet distance in the rows, they will have room enough to grow three or four years longer; by which time, if the plants have made good progress, their roots will have spread over the ground, therefore it will be proper to take up every other tree in the rows. But by this I do not mean to be exact in the removing, but to make choice of the best plants to stand, whichever rows they may be in, or if they should not be exactly at the distance here assigned. All that is designed here, is to lay down general rules, which should be as nearly complied with as the plants will permit; therefore every person should be guided by the growth of the trees in the performance of this work.

When the plants have been reduced to the distance of about eight feet, they will not require any more thinning. But in two or three years time, those which are not to remain will be fit to cut down, to make stools for under-wood; and those which are to remain, will have made such progress as to become a shelter to each other, for this is what should be principally attended to whenever the trees are thinned; therefore in all such places as are much exposed to the wind, the trees should be thinned with great caution, and by slow degrees, for if the air is let too much at once in the plantation, it will give a sudden check to the trees, and greatly retard their growth; but in sheltered situations, there need not be so great caution used as in those places, for the plants will not be in so much danger of suffering.

The distance which I should choose to allow to those trees which are designed to remain for timber is, from twenty-five to about thirty feet, which will not be too near, where the trees thrive well; in which case their heads will spread, so as to meet in about thirty or thirty-five years; nor will this distance be too great, so as to impede the upright growth of the trees. This distance is intended, that the trees should enjoy the whole benefit of the soil; therefore, after one crop of the under-wood, or at the most two crops are cut, I would advise the stubbing up the stools, that the ground may be entirely clear, for the advantage of the growing timber, which is what should be principally regarded; but in general most people have more regard to the immediate profit of the under-wood than the future good of the timber, and frequently by so doing spoil both; for if the under-wood is left after the trees have spread so far as that their heads meet, it will not be of much worth, and yet, by their stools being left, they will draw away a great share of nourishment from the timber-trees, and retard them in their progress.

The soil in which the Oak makes the greatest progress, is a deep rich loam, in which the trees grow to the largest size; and the timber of those trees which grow upon this land, is generally more pliable than that which grows on a shallow or drier ground, but the wood of the latter is much more compact and hard. Indeed there are few soils in *England* in which the Oak will not grow, provided there is proper care taken in their cultivation, though this tree will not thrive equally in all soils; but yet it might be cultivated to a national advantage upon many large wastes in several parts of *England*, as also to the great profit of the estates where these tracts of land now lie uncultivated, and produce nothing to the owner. And should the present temper of destroying the timber of *England* continue in practice some years longer, in the same degree which it has for some years past, and as little care taken to raise a supply, this country, which has been so long esteemed for its naval strength, may be obliged to seek for timber abroad, or be content with such a naval strength as the poor remains

of some frugal estates may have left growing; for as to the large forests, from whence the navy has been so long supplied, a few years will put an end to the timber there; and how can it be otherwise, when the persons to whose care these are committed, reap an advantage from the destruction of the timber?

Before I quit this subject, I must beg leave to take notice of another great evil, which is of so much consequence to the publick, as to deserve their utmost attention; which is, that of cutting down the Oaks in the spring of the year, at the time when the sap is flowing. This is done for the sake of the bark, which will then easily peel off; and for the sake of this, I think, there is a law, whereby people are obliged to cut down their timber at this season. But by so doing, the timber is not half so durable as that which is fallen in the winter; so that those ships which have been built of this spring-cut timber, have decayed more in seven or eight years, than others which were built with timber cut in winter, have done in twenty or thirty. And this our neighbours the *French* have experienced, and therefore have wisely ordered, that the bark should be taken off the trees standing, at the proper time, but the trees are left till the next, and sometimes until the second winter, before they are cut down; the timber of these are found to be more durable and better for use, than that of any trees which have not been peeled. Therefore, I wish we were wise enough to copy after them in those things which are for the publick good, rather than to imitate them in their follies, which has been too much the fashion of late years.

The other sorts of Oak, which are only planted for pleasure, either in parks or gardens, may be raised from Acorns sown in beds, and the plants may be trained in a nursery three or four years; then they should be planted where they are to remain, for although they are not cultivated for their wood, yet the younger they are planted out, the better they will succeed, provided they are kept clean from weeds, and secured from animals.

QUICK. By the word quick are generally understood all live hedges, of whatever sort of plants they are composed, to distinguish them from dead hedges; but, in the more strict sense of this word, it is applied to the Hawthorn, or *Mespilus Sylvestris*; under which name, the young plants or sets are commonly sold by the nursery-gardeners, who raise them for sale.

In the choice of these sets, those which are raised in the nursery are to be preferred to such as are drawn out of the woods, because the latter have seldom good roots, though as they are larger plants than are commonly to be had in

the nursery, many people prefer them on that account; but from long experience I have found, that those hedges which have been planted with young plants from the nursery, have always made the best hedges. Indeed, if persons would have patience to wait for these from seed, and to sow the haws in the place where the hedge is designed, these unremoved plants will make a much stronger and more durable fence, than those which are transplanted; but I am aware that most people will be for condemning this practice, as being tedious in raising; but if the haws are buried one year in the ground, to prepare them for vegetation before they are sown, it will not be so long before this will become a good fence, as is generally imagined. Nay, from some trials of this kind which I have made, I have found that those plants which have remained where they came up from seed, have made such progress as to overtake, in six years, plants of two or three years growth, which were transplanted at the time when these seeds were sown.

And if the hedges are raised from seed, it will not be amiss to mix Holly-berries with the Haws; the Berries and Haws should be buried one year, to prepare them, so that then both will come up together the following spring; and this mixture of Holly, with the quick, will not only have a beautiful appearance in the winter, but will also thicken the hedge at the bottom, and make it a better fence.

But where the hedge is to be planted, the sets should not be more than three years old from the Haws, for when they are older, their roots will be hard and woody; and as they are commonly trimmed off before the sets are planted, so they very often miscarry, and such of them as do live, will not make so good progress as younger plants, nor are they so durable; for these plants will not bear transplanting so well as many others, especially when they have stood long in the seed-bed unremoved.

The method of planting, as also of plashing and pruning of these hedges, having been fully explained under the article **HEDGES**, I shall not repeat it here.

QUICK-BEAM. See *Sorbus Sylvestris*.

QUINCE-TREE. See *Cydonia*.

QUINCUNX ORDER is a plantation of trees, disposed originally in a square, consisting of five trees, one at each corner, and a fifth in the middle, which disposition, repeated again and again, forms a regular grove, wood, or wilderness, and, when viewed by an angle of the square or parallelogram, presents equal or parallel alleys.

QUINQUEFOLIUM. See *Potentilla*.

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RADISH. See Raphanus.
RADISH (HORSE). See Cochlearia.
RAMPIONS. See Campanula radice esculentâ.
RAMSONS. See Allium.
RANDIA. *Houft. Gen. Nov. 28. Lin. Gen. Plant. 114.*

The Characters are,

The empalement of the flower is of one leaf cut into five short segments at the brim. The flower is funnel-shaped, cut into five parts at the top; it hath five short stamina, terminated by oblong erect summits, and an oval germen, supporting a cylindrical style, crowned by two obtuse unequal stigmas. The germen afterward becomes an oval capsule, with one cell, having a hard cover, including many compressed cartilaginous seeds, surrounded with pulp.

We have but one Species of this genus at present in the English gardens, viz.

RANDIA foliis ovatis emarginatis, spinis geminatis, caule fruticoso. Randia with oval leaves, which are indented at the top, spines growing by pairs, and a shrubby stalk.

This plant grows naturally at *La Vera Cruz*, where the late Dr. *Houftoun* found it in plenty, and sent the seeds to Europe; he gave this title to the genus in honour of Mr. *Isaac Rand*, who was a curious botanist. It was discovered by Sir *Hans Sloane* in the island of *Barbadoes*.

It rises with a shrubby stalk to the height of ten or twelve feet, covered with a whitish bark. The branches come out opposite from the side of the stalk, each pair crossing the other; the leaves are of a thick consistence, roundish, and a little indented at the top, placed by pairs, standing upon short foot-stalks. At the joints immediately under the leaves are two short spines standing opposite. The flowers are produced from the side of the branches; they are small, white, tubulous, and divided at the brim slightly into five parts. These are succeeded by oval berries about the size of a marble, having a brittle shell under a thin skin, with one cell, inclosing many compressed seeds, surrounded with black pulp. It is propagated by seeds, which should be sown early in the spring in pots, and plunged into a hot-bed of tanners bark. When the plants come up, they must have fresh air admitted to them every day, when the weather is warm. In about a month's time after the plants come up, they will be fit to transplant, when they should be carefully shaken out of the pots, and each planted into a separate small pot, and then plunged into the hot-bed again, where they must be screened from the sun, until they have taken new root; after which time they must have air and moisture, in proportion to the warmth of the season. The plants may remain in the hot-bed till toward *Michaelmas*, when the nights begin to be cold; at which time they should be removed into the stove, and, if they are plunged into the bark-bed, it will greatly forward their growth, though they will live in the dry stove, if they are kept in a moderate temperature of heat. During the two first seasons, while the plants are young, it will be proper to keep them constantly in the stove, but then their leaves must be washed, whenever they contract filth; this will bring them forward; but, after the plants have obtained

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strength, they may be exposed every summer to the open air, in the warmest part of the year, for two or three months, provided they are placed in a warm situation, but in winter they must be constantly placed in a stove, and kept in a moderate warmth, otherwise they will not live in this country.

The leaves of this plant continue green throughout the year, which renders the plant valuable, because it makes an agreeable variety in the winter season, when mixed with other tender plants.

RANUNCULUS. *Tourn. Inst. R. H. 285. tab. 149.* Crowfoot.

The Characters are,

The empalement of the flower is composed of five oval concave leaves; the flower has five obtuse petals, which have a narrow base; each of these have an open nectarium upon their tails. It hath many stamina, terminated by oblong, erect, twin summits, and numerous germen collected in a head, having no styles, but are crowned by small reflexed stigmas. The germen afterward become seeds of uncertain irregular figures, fastened to the receptacle by very short foot-stalks.

I shall not here enumerate all the species of this genus, many of which are common weeds in most parts of England, and others are so in several parts of Europe, so are rarely admitted into gardens, therefore I shall only mention those sorts which are cultivated in gardens.

1. **RANUNCULUS calycibus patulis, pedunculis teretibus, foliis tripartito-multifidis, summis linearibus.** *Lin. Flor. Suec. 466. flore pleno.* Ranunculus with a spreading empalement, a taper foot-stalk, many-pointed leaves, divided by threes, and those at the top linear, bearing a double flower; upright Garden Ranunculus with a double flower.

2. **RANUNCULUS calycibus patulis, pedunculis sulcatis, foliis repentibus, foliis compositis.** *Flor. Suec. 468. flore pleno.* Ranunculus with a spreading empalement, furrowed foot-stalks, creeping shoots, and compound leaves, with a double flower; or Garden Ranunculus.

3. **RANUNCULUS foliis radicalibus reniformibus crenatis sublobatis, caulinis tripartitis lanceolatis integerrimis, caule multifloro.** *Lin. Sp. Plant. 550.* Ranunculus with kidney-shaped lower leaves, which are crenated and almost divided into lobes, but those upon the stalks divided into three spear-shaped lobes, which are entire, bearing many flowers on a stalk.

4. **RANUNCULUS foliis omnibus quinatis lanceolatis incisoferratis.** *Hort. Cliff. 229. flore pleno.* Ranunculus with all the leaves divided into five spear-shaped segments, which are sawed, and bear a double flower; commonly called Mountain Ranunculus.

5. **RANUNCULUS foliis linearibus sessilibus, caule erecto sulcato, pedunculis longissimis.** Ranunculus with linear leaves fitting close to the stalk, which is erect, furrowed, having very long foot-stalks to the flowers.

6. **RANUNCULUS foliis supra decompositis, caule simplicissimo unifolio, radice tuberosâ.** *Hort. Cliff. 230. flore pleno.* Ranunculus with leaves, which are decomposed above, a single stalk bearing one leaf, and a tuberous root with a double flower.

7. *RANUNCULUS foliis radicalibus reniformibus crenatis incis, caulinis digitatis linearibus, caule multiflora.* Hort. Cliff. 229. *flora pleno.* Ranunculus with kidney-shaped, crenated, lower leaves, those on the stalks hand-shaped, linear, and stalks bearing many flowers.

8. *RANUNCULUS foliis ovatis acuminatis amplexicaulis, caule subuniflora, radice fasciculata.* Hort. Cliff. 229. Ranunculus with oval acute-pointed leaves, which embrace the stalks, one flower upon a stalk, and roots growing in bunches.

9. *RANUNCULUS caule erecto bifolio, foliis multifidis, caulinis alternis sessilibus.* Flor. Leyd. Prod. 492. Ranunculus with an erect stalk bearing two leaves, which are many-pointed, those upon the stalks alternate and sitting close.

10. *RANUNCULUS foliis ternatis biternatisque, foliolis trifidis obtusis, caule simplici.* Ranunculus with leaves placed by threes, which are divided again into twice trifoliate leaves, ending in three obtuse points, and a simple stalk.

11. *RANUNCULUS foliis ternatis biternatisque, foliolis trifidis incis, caule inferno ramoso.* Lin. Sp. Plant. 552. Ranunculus with trifoliate and twice trifoliate leaves, whose lobes are trifid and cut, and a stalk branching at the bottom.

The first sort is a variety of the common upright Meadow Ranunculus, which grows naturally in almost every pasture; but as this hath double flowers, so it is cultivated in gardens. The stalks of this are erect, and rise more than a foot high; the lower leaves have very long foot-stalks; they are divided into several segments, resembling those of the Aconite, or Monkshood; the leaves toward the top of the stalks are cut into linear segments to the bottom; the stalk branches at the top into several foot-stalks, which are terminated by double yellow flowers. This is propagated by parting of the roots in autumn, and should be planted in a moist soil and a shady situation.

The second sort is a variety of the common creeping Crowfoot, which grows naturally in cultivated fields in most parts of *England*. The shoots from the root of this sort trail upon the ground, and put out roots from every joint in the manner of the Strawberry, so that when it is once introduced into a garden, it will multiply fast enough; the leaves and stalks are hairy; the flowers are yellow and double, but small.

The third sort grows naturally in *Crete*. This hath an Asphodel root; the lower leaves are large, kidney-shaped, and a little hairy, deeply crenated on their borders, and are divided almost into five lobes, having long hairy foot-stalks. The stalks rise about nine or ten inches high, garnished with two or three leaves, which are cut into three entire segments; the top of the stalk divides into several foot-stalks, each sustaining one large pale yellow flower. It is propagated by offsets from the roots, in the same way as the Garden Ranunculus, and should be planted in a warm border, otherwise the frost will destroy the roots.

The fourth sort grows naturally upon the *Alps*, with a single flower, but the double has been obtained by seeds, and is preserved in many curious gardens for the beauty of its flowers. This is by some gardeners called the Fair Maid of *France*; it hath a perennial root, composed of many strong fibres; the leaves are divided into five spear-shaped lobes; they are deeply sawed on their edges, and have several longitudinal veins. The stalks rise a foot and a half high, and branch out at the top into three or four divisions; at each of which there is one leaf, of the same shape with the lower, but smaller. The flowers are pure white and very double, each standing upon a short foot-stalk. This is propagated by parting the roots in autumn, as soon as the leaves decay, and should be planted in an east border, and a loamy soil, not too stiff.

The fifth sort grows naturally on the *Alps*. This has a

perennial root; the leaves are long and narrow, like those of Grass, sitting close to the stalks, which rise a little more than a foot high; these divide at the top into three or four slender foot-stalks, which are terminated by single yellow flowers, like those of the common Butterflower. There is a double flower of this kind in the *Paris* garden, but we have not yet got it in *England*.

The sixth sort grows naturally in *Austria*, and also in the *Levant*. This hath a tuberous root; the leaves decomposed and smooth; the stalks rise near a foot high, and have one leaf of the same shape with the lower, but smaller; the stalk is terminated by one double flower, about the size of the common Butterflower, but of a fine bright yellow colour. It is propagated by offsets from the roots in the same way as the Garden Ranunculus, and must be planted in a warm border, otherwise the frost will destroy the roots in winter.

The seventh sort is a variety of the common sweet Wood Ranunculus, which hath a double flower. This is a very hardy plant; it may be easily propagated by the root, and should have a loamy soil and a shady situation.

The eighth sort grows naturally upon the *Alps* and *Apennine* mountains, where it seldom rises more than six inches high; the leaves are narrow, and but one flower upon a stalk; but when it is planted in a garden, the stalks rise a foot and a half high, and are garnished with oval acute-pointed leaves, smooth, of a grayish colour, and embrace the stalks with their base; the stalks branch out at the top into several foot-stalks, each sustaining one white flower. It is propagated by parting of the roots in autumn, soon after the leaves decay, and may be planted on a shady border, where it will thrive exceedingly.

The ninth sort was discovered by Dr. *Tournefort* in the *Levant*. This hath a perennial root, from which arise several leaves, cut into many points, like those of Wolf-bane; the stalk rises a foot high, is garnished with two leaves, which sit close, and are alternate. The stalk is terminated by one single yellow flower, much larger than that of the Butterflower. It is propagated by parting of the roots in autumn, and should be planted in a light loamy soil.

The tenth sort is common in the *English* gardens, and was some years past more so than at present; for since the *Persian* Ranunculus has been introduced here, and so many fine varieties have been obtained from seeds, they have almost banished this sort out of the gardens. This hath a grumous root, like the *Persian* sort; the leaves are divided by threes, and those are twice again divided by threes; they are obtuse pointed; the stalk rises about nine inches high, terminated by one large double red flower.

The eleventh sort was originally brought from *Persia*, but since it has been in *Europe* has been greatly improved by culture, many new flowers have been obtained from seeds, amongst which are many with semidouble flowers, which produce seeds; and from these there are such prodigious varieties of new flowers annually obtained, which are of beautiful colours, so as to exceed all other flowers of that season, and even vie with the most beautiful Carnations; these are many of them finely scented, and the roots, when strong, generally produce twenty or thirty flowers upon each; which, succeeding each other, continue in beauty a full month or longer, according to the heat of the season, or the care taken to defend them from the injuries of the weather; all which excellent qualities have rendered them so valuable, that the old sorts are almost disregarded, except in some few old gardens.

All the very double flowers of this sort never produce seeds, so that they are only multiplied by offsets from their roots, which they generally produce in great plenty, if planted in a good soil, and duly attended in winter. The season for planting

their roots is any time in *October*, for if they are planted sooner, they are apt to come up in a short time, and grow pretty rank before winter, whereby they will be in greater danger of suffering by frost, and if they are planted much later, they will be in danger of perishing under ground; so that you should not keep them out of the ground any longer than the beginning or middle of *October*.

The beds in which the *Persian Ranunculus* roots are planted, should be made with fresh light earth, at least three feet deep: the best soil for them may be composed in this manner, *viz.* Take a quantity of fresh earth from a rich upland pasture, about six inches deep, together with the green sward; this should be laid in a heap to rot for twelve months before it is mixed, observing to turn it over very often to sweeten it, and break the clods; to this you should add a fourth part of very rotten neats dung, and a proportionable quantity of sea or drift-sand, according as the earth is lighter or stiffer; if it be light, and inclining to a sand, there should be no sand added, but if it be a hazel loam, one load of sand will be sufficient for eight loads of earth; but if the earth is strong and heavy, the sand should be added in a greater proportion: this should be mixed eight months or a year before it is used, and should be often turned over, in order to unite their parts well together, before it is put into the beds.

The depth which this should be laid in the beds, must be about three feet; this should be sunk below the surface, in proportion to the dryness or moisture of the place where they are situated, which in dry ground should be two feet eight inches below the surface, and the beds raised four inches above; but in a moist place they should be two feet four inches below, and eight above the ground; and in this case, it will be very proper to lay some rubbish and stones in the bottom of each bed, to drain off the moisture; and if upon this, at the bottom of the beds, some very rotten neats dung is laid two or three inches thick, the roots will reach this in the spring, and the flowers will be fairer. This earth I would by no means advise to be screened very fine, only in turning it over each time, you should be careful to break the clods, and throw out all large stones, which will be sufficient; for if it is made very fine, when the great rains in winter come on, it will cause the earth to bind into one solid lump, whereby the moisture will be detained, and the roots, not being able to extend their tender fibres, will rot. Of this I have many examples, but one particularly to my cost: when I had procured a fine parcel of these roots from abroad, and being desirous of having them thrive very well, I took great pains to screen the earth of my beds very fine, which I laid above two feet deep, and planted a good part of my roots therein; but the season advancing, and having a great deal of other business upon my hands, I did not screen the earth of all my beds, but planted some of them without doing any thing more than raking them; and the success was, that the roots in those beds which were screened, did, great part of them, entirely rot, and the remaining part were so weak, as not to produce any good flowers; whereas those which were planted in the beds which were not screened, did thrive and flower very well, and scarce any of the roots failed, though the earth of all the beds was the same, and were in the same situation, both with regard to wind and sun; so that the damage which those roots sustained, was owing entirely to the fineness of the earth, and this I have several times since observed in other gardens.

I am aware, that this depth of three feet, which I have here directed to make the beds for these flowers, will be objected to by many persons, on account of the expence and trouble of preparing them, as also supposing it unnecessary to make the beds so deep, for flowers whose roots

are small; but if they will give themselves the trouble of making the experiment, by preparing one bed in this manner, and another in the common way, and plant them both with the same flowers, they will soon be convinced of their error, by the success of the flowers. For in the beds which have been prepared of this depth, I have seen one root produce upward of fifty flowers, each of which grew near a foot high, and were extremely large and fair; whereas, in the common method of culture, they are thought to do very well, when they produce eight or ten flowers on each root, and those grow six inches high; but if a person will trace the length of the small fibres of these roots, he will find them to extend three or four feet downwards. And as it is by these distant fibres that the nourishment is taken in, for the increase and strength of the flowers; so if these meet with a poor barren soil below, they shrink, and the flowers are starved for want of proper nourishment in the spring, when it is most required.

The beds being thus prepared, they should lie a fortnight or more to settle, before the roots are planted, that there may be no danger of the earth settling unequally after they are planted, which would prejudice them, by having hollow places in some parts of the bed, to which the water would run and lodge, and so rot the roots. Then having levelled the earth, laying the surface a little rounding, you should mark out the rows by a line, at about six inches distance each way, so that the roots may be planted every way in straight lines; then you should open the earth with your fingers at each cross, where the roots are to be planted about two inches deep, placing the roots exactly in the middle, with their crowns upright; then with the head of a rake you should draw the earth upon the surface of the bed level, whereby the top of the roots will be about an inch covered with earth, which will be sufficient at first. This work should be done in dry weather, because the earth will then work better than if it were wet; but the sooner after planting there happens to be rain, the better it will be for the roots, for if it should prove dry weather long after, and the earth of the beds be very dry, the roots will be subject to mould and decay; therefore in such a case it will be proper to give a little water to the beds, if there should no rain happen in a fortnight's time, which is very rare at that season of the year, so that they will seldom be in danger of suffering that way.

When the roots are thus planted, there will no more be required until toward the end of *November*, by which time they will begin to heave the ground and their buds appear, when you should lay a little of the same fresh earth, of which the beds were composed, about half an inch thick all over the beds, which will greatly defend the crown of the root from frost; and when you perceive the buds to break through this second covering, if it should prove very hard frost, it will be very proper to arch the beds over with hoops, and cover them with mats, especially in the spring, when the flower-buds will begin to appear, for if they are exposed to too much frost, or blighting winds at that season, their flowers seldom open fairly, and many times their roots are destroyed.

In the beginning of *March* the flower-stems will begin to rise, at which time you should carefully clear the beds from weeds, and stir the earth with your fingers between the roots, being very careful not to injure them; this will not only make the beds appear handsome, but also greatly strengthen their flowers. When the flowers are past, and the leaves are withered, you should take up the roots, and carefully clear them from the earth; then spread them upon a mat to dry, in a shady place; after which they may be put up in bags or boxes in a dry room, until the *October* following, which is the season for planting them again.

These *Persian* sorts are not only propagated by offsets from the old roots, but are also multiplied by seeds, which the semidouble kinds produce in plenty; therefore, whoever is desirous to have these in perfection, should annually sow their seeds, from which new varieties will be every year produced; but in order thereto, you should be careful in sowing your seed, or in procuring it from such persons as understand how to save it; that is, who will be careful not to leave any flowers for seeds, but such as have five or six rows of petals at least, and are well coloured, for since these flowers increase plentifully, it is not worth the trouble to sow any indifferent seeds, because there can be but little hopes of obtaining any good flowers from them.

Being prepared with seeds about the middle of *August*, which is the proper season for sowing of them, you should get some large pots, flat seed pans, or boxes. These should be filled with light rich earth, levelling the surface very even; then sow the seeds thereon pretty thick, and cover it about a quarter of an inch thick with the same light earth; after which you should remove these pots or boxes into a shady situation, where they may have the morning sun until ten of the clock; and if the season should prove dry, you must often refresh them with water, being very careful in doing of this, not to wash the seeds out of the ground. In this situation the pots should remain until the beginning of *October*, by which time the plants will begin to come up, though sometimes the seeds will remain in the earth until *November*; then you should remove the pots into a more open exposure, where they may have full sun, which at that time is necessary to exhale the moisture of the earth; but toward the middle or end of *November*, when you are apprehensive of frost, the pots should be removed under a common hot-bed frame, where they may be covered with the glasses in the night time, and in bad weather; but in the day, when the weather is mild, they should be entirely opened, otherwise the plants will draw up too weak. The only danger they are in, is from violent rains and frosts, the first often rotting the tender plants, and the frost will often turn them out of the ground, therefore they should be carefully guarded against both these.

In the spring, as the season grows warm, these pots should be exposed to the open air, placing them at first near the shelter of a hedge, to protect them from the cold winds; but towards the beginning or middle of *April*, they should be removed again into a more shady situation, according to the warmth of the season, and if it should prove dry, they must be sometimes refreshed with water; but you should be careful not to give it to them in great quantities, which is very apt to rot these tender roots; the latter end of *April* or beginning of *May*, they should be placed where they may have only the morning sun, in which place they may remain till their leaves decay, when they may be taken out of the earth, and the roots dried in a shady place; after which they may be put up in bags, and preserved in a dry place until the *October* following, when they must be planted in the manner before directed for the old roots.

The spring following these roots will flower, at which time you should carefully mark such of them as are worthy to be preserved, and the single, or bad coloured flowers, may be pulled up and thrown away, which is the surest method of removing them from the good sorts; for if they are permitted to remain together until their leaves decay, there may be some offsets of the bad sorts mixed with the good flowers. You should not suffer those flowers, which you intend to blow fine the succeeding year, to bear seeds, but cut off the flowers when they begin to decay, for those roots which have produced seeds, seldom flower well afterwards; nor will the principal old root, which has flowered

strong, ever blow so fair as will the offsets, which is what should be principally observed, when a person purchases any of these roots, for great part of the complaints made by those who have bought these roots at a dear rate, is principally owing to this. The persons who sold them, being apprized of this matter, have parted with their old roots to their purchasers, and reserved the offsets for their own use; which old roots have often so much degenerated from what they were the preceding year, as to cause a suspicion, whether the persons they were purchased from had not changed the roots: this degeneracy attends these flowers, after having flowered extremely large and fair, or that they have been permitted to seed; so that it is absolutely necessary to sow seeds every year, in order to preserve a succession of good flowers.

The manner of preparing the beds, and the distance and method of planting the roots, having been already directed, I shall not repeat it here, but will only observe, that these flowers being tender, must be protected from hard frosts, and cutting sharp winds, especially after *Christmas*, when their flower-buds are forming, for if they are neglected at that season, their flowers will rarely prove fair; nor should you suffer them to receive too much wet in winter or spring, which is equally as injurious to them as frost. In planting of these roots you should observe to place the semidouble kinds, from which you intend to save seeds, in separate beds by themselves, and not intermix them with the double flowers, because they will require to be treated in a different manner, for when the flowers of the semidouble kinds begin to fade, you should carefully guard them from wet, for if they are permitted to receive hard rains, or are watered at that season, the seeds rarely come to maturity, or are so weak, that scarce one in fifty of them will grow.

When the seed begins to ripen (which may be easily known, by their separating from the axis and falling) you should look over the beds every day, gathering it as it ripens, for there will be a considerable distance in the seeds of the same bed coming to maturity, at least a fortnight, three weeks, or a month. When you gather the seed, it should not be exposed to the sun, but spread to dry in a shady place; after which you must put it up where the vermin cannot come to it, until the time of sowing it.

By this method of sowing seeds every year, you will not only increase your stock of roots, but also raise new varieties, which may be greatly mended by changing the seeds into fresh ground; for if a person continually sows his seed in the same garden many years, they will not produce near so fine flowers, as if he procured his seeds at some distance, which is also the case with most other plants.

It will also be necessary to take away all the earth out of the beds in which the roots were blown the preceding year, and put in new, if you intend to plant *Ranunculuses* there again, otherwise they will not thrive near so well, notwithstanding you may add some new compost to the beds, and this is what all the curious florists continually observe.

RAPA. *Tourn. Inst. R. H. 228. tab. 112.* Turnep.

The Characters are,

The empalement of the flower is three leaved: The flower hath four plain spreading petals, which are narrow at their base. It has four oval honey glands, situated between the stamina and style, and six erect oval-shaped stamina; the two which are opposite are the length of the empalement, the other four are longer, terminated by erect acute-pointed summits. It hath a taper germen, supporting a short thick style, crowned by an entire beaded stigma. The germen afterward becomes a long taper pod, depressed on the sides, opening in two cells, which are filled with roundish seeds.

The Species are,

1. RAPA radice orbiculatâ depressâ carnosâ. Turnep with an orbicular, depressed, fleshy root.

2. RAPA

2. *RAPA radice oblongâ carnosâ*. Turnep with an oblong fleshy root.

3. *RAPA radice fusiformi*. Turnep with a spindle-shaped root; commonly called *French Turnep*.

The first is the Turnep which is commonly cultivated in the fields, of which there are the following varieties, *viz.* the round red or purple topped Turnep, the green topped Turnep, the yellow Turnep, the black rooted Turnep, and the early *Dutch Turnep*. The last sort is commonly sown early in the spring, for to supply the markets in *May* and *June*, but is never cultivated for a general crop. The red rooted Turnep was formerly more cultivated in *England* than at present, for since the large green topped Turnep has been introduced, all the skilful farmers prefer it to the other sorts; the roots of the green will grow to a large size, and continue good much longer than the other sorts. The next to this is the red or purple topped Turnep, which will also grow large, and is extremely good for some time, but the roots of this will become stringy much sooner than those of the green topped. The long rooted Turnep, the yellow Turnep, and the blackish rooted Turnep, are now rarely cultivated in *England*, neither of them being so good for the table or for feed, as the red and green topped Turnep, though there are some few persons who sow them for the sake of variety.

The *French Turnep* is not much cultivated in *England*, but in *France* and *Holland* they are in great esteem, especially for soups, their roots being small, and boiled whole in the soup, and so served up to the table; these must be used while they are young, otherwise they will become rank and stringy.

These are supposed to be only varieties, which have accidentally been obtained from seeds, therefore I have not enumerated them as distinct species; but yet I am certain they are constant, where care is taken in the saving of their seeds, not to suffer any mixture to stand for seeds: I have sown of three or four sorts several years, and have always found them retain their differences; however, it is not easy to determine if some of these were not by culture first obtained from seeds of the common white Turnep. The yellow Turnep seems most unlikely to have been an accidental variety, for I have never known this alter, and the roots are yellow within, whereas all the other have white flesh, notwithstanding their outsides are of very different colours.

The long rooted Turnep, is, I think, a distinct species, the form of the root, and its manner of growth being totally different from the other sorts. I have seen these roots as long as those of the Parsnep, and nearly of the same shape; these run deep into the ground, so are unfit for feeding of cattle; and unless they are used very young, become strong, so not proper for the table, which has occasioned their being rejected of late years.

The green topped Turnep grows above ground more than any of the other, which renders it preferable for feeding of cattle, and being the softest and sweetest root when grown large of any of the kinds, is most esteemed for the table; but in very severe winters they are in greater danger of suffering by frost, than those whose roots lie more in the ground, especially if they are not covered by snow; for when they are frequently hard frozen and thawed, it causes them to rot sooner than those whose flesh is less tender and sweet. I have seen the roots of this sort, which were more than a foot diameter boiled, and were as sweet and tender, as any of the smallest roots.

Turneps delight in a light, sandy, loamy soil, which must not be rich, for in a rich soil they grow rank and are sticky, but if it be moist they will thrive the better in summer, especially in fresh land, where they are always sweeter than upon an old worn-out or a rich soil.

The common season for sowing of Turneps, is any time from the beginning of *June* to the middle of *August*, or a little later; though it is not advisable to sow them much after, because, if the autumn should not prove very mild, they will not have time to apple before winter, nor will the roots of those which are sown after the middle of *July*, grow very large, unless the frost keeps off long in autumn. But, notwithstanding this is the general season in which the greatest part of Turneps are sown in the country, yet about *London* they are sown successively from *March* to *August*, by those who propagate them to supply the markets with their roots; but there is a great hazard of losing those which are sown early in the year, if the season should prove dry, by the fly, which will devour whole fields of this plant while young; so that where a small quantity for the supply of a family is wanted, it will be absolutely necessary to water them in dry weather; and where a person sows those seeds in *April* and *May*, it should always be upon a moist soil, otherwise they seldom come to good, the heat of the weather at that season being too great for them upon a dry soil; but those which are sown toward the middle or latter end of *June*, commonly receive some refreshing showers to bring them forward; without which, it is very common to have them all destroyed.

These seeds should always be sown upon an open spot of ground, for if they are near hedges, walls, buildings, or trees, they will draw up, and be very long topped, but their roots will not grow to any size.

They are sown in great plenty in the fields near *London*, not only for the use of the kitchen, but for food for cattle in winter, when there is a scarcity of other food; and this way is become a great improvement to barren sandy lands, particularly in *Norfolk*, where, by the culture of Turneps, many persons have doubled the yearly value of their ground.

The land upon which this seed is sown, should be ploughed in *April*, and twy-fallowed in *May*, that is, once more ploughed and twice well harrowed, and made very fine; then the seed should be sown pretty thin (for it being small, a little will sow a large piece of ground, one pound is the common allowance for an acre of land). The seed must be harrowed in as soon as it is sown, with a short tinned harrow, and the ground rolled with a wooden roll, to break the clods, and make the surface even. In ten days or a fortnight after sowing, the plants will come up; at which time, if the season should prove dry, they will be in great danger of being destroyed by the fly; but if it so happen, the ground must be sowed again, for the seed being cheap, the chief expence is the labour; but the ground should be first harrowed to loosen it, especially if it is stiff land.

When the plants have got four or five leaves, they should be hoed to destroy the weeds, and to cut up the plants where they are too thick, leaving the remaining ones about six or eight inches asunder each way, which will be room enough for the plants to stand for the first hoeing; the sooner this is performed, when the plants have four leaves, the better they will thrive; but in the second hoeing, which must be performed about a month after the first, they should be cut up, so as that the remaining plants may stand fourteen or sixteen inches distance, or more, especially if they are designed for feeding of cattle, for where the plants are allowed a good distance, the roots will be proportionably large; so that what is lost in number, will be over-gained by their bulk, which is what I have often observed. But in such places where they are sown for the use of the kitchen, they need not be left at a greater distance than ten inches or a foot, because large roots are not so generally esteemed for the table.

It is not many years since the practice of sowing Turneps for feeding of cattle, has been of general use; how it happened that this improvement should have been so long neglected in every part of *Europe*, is not easy to determine, since it is very plain, that this piece of husbandry was known to the ancients. For *Columella*, in treating of the several kinds of vegetables which are proper for the field, recommends the cultivating Rapa in plenty; because (says he) those roots which are not wanted for the table, will be eaten by the cattle: yet this plant was not much cultivated in the fields till within the last sixty or seventy years, nor is the true method of cultivating Turneps yet known, or at least not practised, in some of the distant counties of *England*, at this time. For in many places the seed is sown with Barley in the spring, and those plants which come up, and live till the Barley is cut, produce a little green for the sheep to pick up, but never have any roots. In other places, where the Turnep-seed is sown by itself, the method of hoeing them is not understood, so that weeds and Turneps are permitted to grow together; and where the Turneps come up thick in patches, they are never thinned, so that they draw up to have long leaves, but never can have good roots, which is the principal part of the plant, therefore should be chiefly attended to.

The general method now practised in *England*, for cultivating this plant in the fields, is the same as is practised by the farming gardeners, who supply the *London* markets with these roots, and is the same as before directed. But it is only within the compass of a few years, that the country-people have been acquainted with the method of hoeing them; so that the farmers formerly employed gardeners, who had been bred up in the kitchen-gardens, to perform this work. The usual price given *per acre*, for twice hoeing and leaving the crop clean, and the plants set out properly, was seven shillings; at which price the gardeners could get so much *per week*, as to make it worth their while to leave their habitations, and practise this in different counties, during the season for this work, which always happens, after the greatest hurry of business in the kitchen-gardens is over; so that they usually formed themselves in small gangs of six or seven persons, and set out on their different routs, each gang fixing at a distance from the rest, and undertaking the work of as many farmers in the neighbourhood, as they could manage in the season; but as this work is now performed by many country labourers, that practice is lost to the kitchen-gardeners, the labourers doing it much cheaper.

There has also been another method practised very lately, by some very curious farmers, in cultivating of Turneps, which is, by sowing the seed in rows, with the drill-plough. In some places the rows are sown three feet asunder, in others four, in some five, and some six. The latter has been recommended by some, as the most proper distance; and although the intervals are so large, yet the crop produced on an acre has been much greater than upon the same quantity of land, where the rows have been but half this distance; and upon all the fields which have been tilled, the crops have greatly exceeded those which have been hand-hoed. The late lord viscount *Townshend* was at the expence of making the trial of these two different methods of husbandry, with the greatest care, by equally dividing the same fields into different lands, which were alternately sown in drills, and the intermediate lands in broad cast. The latter were hoed by hand, in the common method, and the other cultivated by the hoeing-plough; and when the roots were fully grown, his lordship had an equal quantity of land, which had been sowed in the different methods, measured, and the roots drawn up and weighed; those roots which had been cultivated by the plough, were so much

larger than the other, that the crop of one acre weighed a ton and a half more than that of an acre in the other husbandry.

But when the Turneps are sown in drills, they will require to be hoed by hand, to separate and cut out the plants, where they are too near together in the rows; as also to cut up the weeds between the plants, where the plough cannot reach them. If this is carefully performed, the ploughing of the intervals will encourage the growth of the roots, by thus stirring of the ground, and make it much better prepared for the crop of Barley, or whatever else is sown the following spring. This method of culture may be supposed to be more expensive than that commonly practised, by those unacquainted with it, but those who have made trials of both, find the horse-hoeing to be much the cheapest, and by far the best. For the country people, who are employed in hand-hoeing of Turneps, are very apt to hurry over their work, so that half the weeds are left growing, and the plants are seldom singled out so well as they should be; nor are they curious enough to distinguish the Charlock (which is one of the most common weeds in arable land) from the Turneps; so that about the middle of *September*, it is very common to see the fields of Turneps full of the yellow flowers of the Charlock. Now, in the horse-hoeing, all the weeds in the intervals will be entirely destroyed; so that if a few plants in the rows of Turneps should be overlooked, they may be easily drawn when they appear visible, and by this method the land will be sooner and better cleaned from weeds.

The greatest evil which attends a crop of Turneps, is that of their being destroyed by the fly, which usually happens soon after the plants come above ground, or while they are in the seed-leaf, for, after they have put out their rough leaves pretty strong, they will be past this danger. This always happens in dry weather, so that, if there should be rain when the Turneps come up, they will grow so fast, as to be in a few days out of danger from the fly; and it hath been found, that those, which have been sown in drills, have escaped the fly much better than those sown in broad cast; but, if foot is sown along the surface of each drill, it will be of great service to keep off the fly, and a small quantity of it will be sufficient for a large field, where the drills only are to be covered.

Another danger of the crops being destroyed is from the caterpillars, which very often attack them, when they are grown so large as to have six or eight leaves on a plant. The surest method of destroying these insects, is to turn a large parcel of poultry into the field, which should be kept hungry, and turned early in the morning into the field; these fowls will soon devour the insects, and clear the Turneps. To this evil the Turneps, which are sown in drills, are not so much exposed, for as the ground between the rows will be kept stirred, the plants will be kept growing, so will not be in danger of suffering from these insects, for the parent insects never deposit their eggs upon any plants which are in health, but as soon as they are stunted, they are immediately covered with the eggs of these insects; and this holds in general with vegetables as with animals, who are seldom attacked by vermin when they are in perfect health; whereas, when they become unhealthy, they are soon overspread with them; so that it is the disease which occasions the vermin, and not the vermin the disease, as is commonly imagined.

When the Turneps are sown in drills, it will be the best way to plow between every other row at first, and some time after to plow the alternate intervals, by which method the plants will receive more benefit from the often stirring the ground than they would do, if all the intervals were hoed at one time, and the plants will be in less danger of suffering

suffering from the earth being thrown up too high on some rows, while others may be left too bare of earth; but, when the earth has been thrown up on one side of the drill, it may be turned down again soon after the next interval is plowed. This alternate moving of the earth will prepare the ground very well for the succeeding crop, and greatly improve the Turneps; but, as the plow cannot well be drawn nearer to the drills than two or three inches, the remaining ground should be forked to loosen the parts, and make way for the fibres of the roots to strike out into the intervals; otherwise, if the land is strong, it will become so hard in those places which are not stirred, as to stint the growth of the Turneps. This may be done at a small expence; a good hand will perform a great deal of this work in a day, and, whoever will make the trial, will find their account in practising it, especially on all strong land, where the Turneps are much more liable to suffer from the binding of the ground, than they will be on a loose soil; but yet, in all sorts of ground, it will be of great service to practise this.

When the ground is thus stirred in every part, one plowing will be sufficient, after the Turneps are eaten, for the sowing of Barley, or any other crop; so that there will be an advantage in this, when the Turneps are kept late on the ground, as will often be the case, especially when they are cultivated for feeding of ewes, because it is often the middle of April before the ground will be cleared; for late seed in the spring, before the natural grass comes up, is the most wanted, where numbers of sheep or ewes are maintained, and one acre of Turneps will afford more feed than fifty acres of the best pasture at that season.

In Norfolk and some other counties they cultivate great quantities of Turneps for feeding of black cattle, which turn to great advantage to their farms, for hereby they procure a good dressing for their land; so that they have extraordinary good crops of Barley upon those lands, which would not have been worth the plowing, if it had not been thus husbanded.

When the Turneps are fed off the ground, the cattle should not be suffered to run over too much of the ground, for, if they are not confined by hurdles to as much as is sufficient for them one day, the cattle will spoil three times the quantity of Turneps as they can eat, so that it is very bad husbandry to give them too much room; therefore the hurdles should be every day removed forward, and, if the Turneps are drawn out of the ground before the cattle or sheep are turned into the new inclosure, there will be less waste made, for they will then eat up the whole roots; whereas, if they are turned upon the Turneps growing, they will scoop the roots, and leave the rinds, which being hollow, the urine of the sheep will lodge in them; so that, when they are forked out of the ground, the sheep will not eat any of those roots which are thus tainted.

I cannot omit taking notice of a common mistake, which has generally prevailed with persons who have not been well informed to the contrary, which is, in relation to the mutton which is fatted with Turneps, most people believing it to be rank and ill-tasted, whereas it is a known fact, that the best mutton this country affords is all fatted on Turneps, and that rank mutton, whose fat is yellow, is what the low marshy lands of *Lincolnshire*, and other rank pastures, produce.

In order to save good Turnep seeds, you should transplant some of the fairest roots in *February*, placing them at least two feet asunder each way, observing to keep the ground clear from weeds, until the Turneps have spread so as to cover the ground, when they will prevent the weeds from growing; when the pods are formed, you should carefully guard them against the birds, otherwise they will de-

vour it, especially when it is near ripe; at which time you should either shoot the birds as they alight upon the seed, or lay some birdlimed twigs upon it, whereby some of them will be caught, and, if they are permitted to remain some time, and afterwards turned loose, they will prevent the birds from coming thither again for some time, as I have experienced. When the seed is ripe, it should be cut up, and spread to dry in the sun; after which it may be threshed out, and preserved for use.

There have been many receipts for preventing the fly taking Turneps, but few of them deserve notice, therefore I shall only mention two or three which I have seen tried with success. The first was steeping the seeds in water with flower of brimstone mixed, so as to make it strong of the brimstone: another was steeping it in water with a quantity of the juice of Horse-aloes mixed, both which have been found of use. The sowing of foot or tobacco-dust over the young plants, as soon as they appear above ground, has also been found very serviceable: in short, whatever will add vigour to the young plants, will prevent their being destroyed by the fly, for these never attack them, till they are stunted in their growth.

RAPHANUS. *Tourn. Inst. R. H. 229. tab. 114.* Radish.

The Characters are,

The empalement of the flower is erect. The flower has four heart-shaped petals, placed in form of a cross, which spread open, and are narrow at their base; it hath four honey glands, one on each side the short stamina between them and the style, and one between each of the long stamina and the empalement; it hath six erect stamina; two, which are opposite, are the length of the empalement; the other four are as long as the base of the petals, terminated by single summits, with an oblong swelling germen, crowned by a beaded stigma. The germen afterward becomes an oblong, smooth, spongy pod, having an acute point, swelling and almost jointed, having two cells, divided by an intermediate partition, filled with roundish seeds.

The Species are,

1. RAPHANUS *radice oblongâ*. Radish with an oblong root.
2. RAPHANUS *radice rotundâ*. Round-rooted Radish, or small, round, *Naples Radish*.
3. RAPHANUS *radice orbiculatâ depressâ*. Radish with an orbicular depressed root; commonly called Turnep-rooted, or white *Spanish Radish*.
4. RAPHANUS *radice fusiformi*. Radish with a spindle-shaped root; or the black *Spanish Radish*.
5. RAPHANUS *siliquis teretibus articulatis lævibus unilocularibus*. *Hort. Cliff. 340.* Radish with smooth, taper, jointed pods, having one cell; or white flowering Charlock with a jointed pod.

The last sort grows naturally on arable lands in most parts of *Europe*, so is seldom admitted into gardens.

The other four sorts are supposed to be only seminal variations, but from forty years experience I have never found either of these to vary from one to the other sort; and I am certain, whoever will make the trial, by saving the seeds of each carefully without mixture, will always find the plants prove the same as the seeds were saved from.

The first sort here mentioned is that which is commonly cultivated in kitchen-gardens for its roots, of which there are several varieties, as the small-topped, the deep red, the pale red or salmon, and the long-topped striped Radish; all which are varieties arising from culture. The small-topped sort is most commonly preferred by the gardeners near *London*, because they require much less room than those with large tops; for as the forward Radishes are what produce the greatest profit to the gardener, which are commonly sown upon borders near hedges, walls, or pales, if they are of the large-topped sort, will be apt to grow mostly to a top, and

and not swell so much in the root as the other, especially if they are left pretty close.

The seasons for sowing this seed are various, according to the time when they are desired for use; but the earliest season is commonly toward the latter end of *October*, that the gardeners near *London* sow them to supply the markets; and these, if they do not miscarry, will be fit for use in the beginning of *March* following, which is full as soon as most people care to eat them. These are commonly sown on warm borders near walls, pales, or hedges, where they may be defended from the cold winds; but there are some who sow Radish seeds among other crops in the middle of *September*, and, if these are not destroyed by frost, they will be fit for use soon after *Christmas*; but these must be eaten while they are young, for they soon grow sticky and strong.

The second sowing is commonly about *Christmas*, provided the season be mild, and the ground in a fit condition to work; these are also sowed near shelter, but not so near pales and hedges as the first sowing. If these are not destroyed by frost, they will be fit for use the end of *March* or the beginning of *April*; but, in order to have a succession of these roots for the table through the season, you should repeat the sowing of their seeds once a fortnight from the middle of *January* till the beginning of *April*, always observing to sow the latter crops upon a moist soil, and an open situation, otherwise they will run up, and grow sticky, before they are fit for use.

Many of the gardeners near *London* sow Carrot-seed with their early Radishes, so that when their Radishes are killed, which sometimes happens, the Carrots will remain, for the seeds of Carrots commonly lie in the ground five or six weeks before they come up, and the Radishes seldom lie above a fortnight under ground at that season, so that these are often up and killed, when the Carrot-seed remains safe in the ground; but, when both crops succeed, the Radishes must be drawn off very young, otherwise the Carrots will be drawn up so weak, as not to be able to support themselves, when the Radishes are gone.

It is also a constant practice with the kitchen-gardeners to mix Spinach-seed with their latter crops of Radishes, so that when the Radishes are drawn off, and the ground cleaned between the Spinach, it will grow prodigiously, and in a fortnight's time will as completely cover the ground as though there had been no other crop. And this Spinach, if it be of the broad-leaved kind, will be larger and fairer than it commonly is when sown by itself, because where people have no other crop mixed with them, they commonly sow them too thick, whereby they are drawn up weak; but here the roots standing pretty far apart, so after the Radishes are gone, they have full room to spread, and, if the soil be good, it is a prodigious size this Spinach will grow to, before it runs up for seed; but this husbandry is chiefly practised by such gardeners as pay very dear for their land, and are obliged to have as many crops in a year as possible, otherwise they could not afford to pay such large rents.

When the Radishes are come up, and have got five or six leaves, they must be pulled up where they are too close, otherwise they will draw up to a top, but the roots will not increase their bulk. In doing of this, some only draw them out by hand, but the best method is to hoe them with a small hoe, which will stir the ground, and destroy the young weeds, and also promote the growth of the plants. The distance which these should be left, if for drawing up small, may be three inches, but, if they are to stand until they are pretty large, six inches are full near enough, and a small spot of ground will afford as many Radishes at each sowing, as can be spent in a family while they are good.

If you intend to save seeds of your Radishes, you should, at the beginning of *May*, prepare a spot of ground in proportion to the quantity of seeds intended (but you should always make allowance for bad seasons, because it often happens, in a very dry season, that there will not be a fourth part of the quantity of seeds upon the same proportion of ground as there will be in a moist season). This ground should be well dug and levelled; then you should draw up some of the straight and best-coloured Radishes (throwing away all such as are short, and that branch out in their roots); these should be planted in rows three feet distance, and two feet asunder in the rows, observing, if the season be dry, to water them until they have taken root; after which they will require no farther care, but only to hoe down the weeds between them, until they are advanced so high, as to spread over the ground, when they will prevent the growth of weeds.

When the seed begins to ripen, you should carefully guard it against the birds, otherwise they will destroy it. When it is ripe (which you may know by the pods changing brown), you should cut it, and spread it in the sun to dry; after which you should thresh it out, and lay it up for use, where the mice cannot come to it, otherwise they will eat it up.

The small round-rooted Radish is not very common in *England*, but in many parts of *Italy* it is the only sort cultivated; the roots of this kind are very white, round, small, and very sweet. This may be propagated in the same manner as the common sort, with this difference, *viz.* that this must not be sown till the beginning of *March*, and the plants allowed a greater distance. The seeds of this kind are very subject to degenerate, when saved in *England*, unless they are at such distance from the common sort, as that the farina of one cannot mix with the other.

The other round-rooted Radishes are rarely cultivated in *England*, but those who have a mind to have them, may sow them in the same manner as the last.

The black and white *Spanish* Radishes are commonly cultivated for medicinal use, but there are some persons who are very fond of them for the table. These are commonly sown about the middle of *July*, or a little earlier, and they are fit for the table by the end of *August*, or the beginning of *September*, and will continue good till the frost spoils them. These must be thinned to a greater distance than the common sort, for the roots of these grow as large as Turneps, therefore should not be left nearer together than six inches.

Some persons, who are very curious to have these roots in winter, draw them out of the ground before the hard frost comes on, and lay them up in dry sand in the same manner as is practised for Carrots, being careful to guard them from wet and frost, and by this method they preserve them till the spring.

RAPISTRUM. See Sinapis.

RAPUNCULUS. *Tourn. Inst. R. II. 113. tab. 38.* Rampion.

The Characters are,

The empalement of the flower is of one leaf, divided into five acute parts, sitting upon the germen. The flower hath one petal, which is starchy, cut into five linear segments, which are recurved; it hath five stamina, which are shorter than the petal, terminated by oblong summits. The germen, which is situated under the flower, supports a slender recurved style, crowned by an oblong, twisted, three-pointed stigma, which afterward becomes a roundish capsule, with three cells, filled with small roundish seeds.

The Species are,

1. RAPUNCULUS *spicâ oblongâ, capsulis bilocularibus, foliis radicalibus cordatis.* Rampion with an oblong spike of flowers, capsules containing two cells, and the lower leaves heart-shaped.

2. *RAPUNCULUS fasciculo terminali sessili, foliis dentatis, radicalibus cordatis.* Rampion with flowers growing in bunches, terminating the stalks, indented leaves, and those at the bottom heart-shaped.

3. *RAPUNCULUS capitulo subrotundo, foliis linearibus integerrimis.* Rampion with roundish heads, and linear entire leaves.

4. *RAPUNCULUS capitulo subfolioso, foliis omnibus lanceolatis.* Rampion with heads which are somewhat leafy, and all the leaves spear-shaped.

5. *RAPUNCULUS capitulo subrotundo, foliis serratis radicalibus cordatis.* Rampion with roundish heads, sawed leaves, the lower ones of which are heart-shaped.

6. *RAPUNCULUS foliis obtusis, spicâ pauciflorâ.* Hall. Helv. 497. Rampion with obtuse leaves, and a spike containing few flowers.

These are all of them hardy plants, which will thrive in the open air. They are propagated by seed, which should be sown in autumn, for if they are kept out of the ground till the spring, they frequently fail. The seeds should be sown on a bed of fresh undunged earth, where they are designed to remain, for they do not thrive so well when they are transplanted; therefore the best method is to make small drills cross the bed about eighteen inches asunder, and sow the seeds therein; then cover them lightly over with earth, for if they are buried too deep, they will rot in the ground. In the following spring the plants will come up, when they should be diligently weeded, which is all the care they will require, only they should be thinned where they are too close, so as to leave them six or seven inches apart in the rows, and afterward they require no farther attention, but to keep them clear from weeds.

As these plants do not continue above two or three years, they should be sown every other year to continue the sorts, for they are plants which require little trouble to cultivate, and their flowers make a pretty variety in large gardens, therefore they may be allowed a place amongst other hardy flowers.

RAPUNTIIUM. Tourn. Inst. R. H. 163. tab. 51. Rampions, or Cardinal Flower.

The Characters are,

The empalement of the flower is cut into five linear segments, the two upper being larger than the other. The flower is of one petal, with a long cylindrical tube, a little curved, and is divided at the brim into five segments, two of which compose the upper lip, and are smaller than the three lower which compose the under; it hath five awl-shaped stamina, terminated by oblong summits, which coalesce at the top in form of a cylinder, but open in five parts at their base; it has an acute germen, situated below the flower, supporting a cylindrical style, crowned by a hairy obtuse stigma. The germen afterward becomes an oval capsule, opening at the top, filled with small seeds.

The Species are,

1. *RAPUNTIIUM caule erecto, foliis lanceolatis serratis, spicâ terminali.* Cardinal-flower with an erect stalk, spear-shaped sawed leaves, and a spike of flowers terminating the stalk; commonly called scarlet Cardinal-flower.

2. *RAPUNTIIUM caule erecto, foliis linearilanceolatis integerrimis acuminatis spicâ terminali.* Cardinal-flower with an erect stalk, linear, spear-shaped, entire, acute-pointed leaves, and a spike of flowers terminating the stalks.

3. *RAPUNTIIUM caule erecto, foliis ovato-lanceolatis crenatis, calycum sinibus reflexis.* Cardinal-flower with an erect stalk, oval, spear-shaped, crenated leaves, and the sinuses of the empalements reflexed; commonly called the blue Cardinal-flower.

4. *RAPUNTIIUM caule erecto, foliis cordatis obsolete dentatis petiolatis, floribus sparsis thyrso longissimo.* Cardinal-flower with an erect stalk, heart-shaped leaves, which are some-

what indented, having foot-stalks, and the longest spike of flowers, which are placed thinly.

5. *RAPUNTIIUM caule erecto, foliis inferioribus subrotundis crenatis, superioribus lanceolatis serratis, spicâ terminali.* Rapuntium with an erect stalk, the lower leaves roundish and crenated, the upper spear-shaped, sawed, and a spike of flowers terminating the stalk.

6. *RAPUNTIIUM caule erecto, foliis ovatis subserratis, pedunculo longioribus, capsulis inflatis.* Cardinal-flower with an erect stalk, oval leaves, which are somewhat sawed, longer than the foot-stalks, and swelling seed-vessels.

7. *RAPUNTIIUM foliis ovalibus crenatis lanatis, floribus lateralibus solitariis.* Cardinal-flower with oval crenated leaves, which are downy, and flowers growing singly from the sides of the stalks.

8. *RAPUNTIIUM foliis lanceolatis dentatis, pedunculis brevissimis lateralibus tubo corollæ longissimo.* Cardinal-flower with spear-shaped indented leaves, very short foot-stalks to the flowers, which proceed from the sides of the stalks, and a very long tube to the petal.

9. *RAPUNTIIUM caule patulo ramoso foliis lanceolatis subdentatis, pedunculis longissimis.* Rapuntium with a spreading branching stalk, spear-shaped leaves, which are somewhat indented, and very long foot-stalks to the flowers.

10. *RAPUNTIIUM caulibus procumbentibus, foliis lanceolatis serratis, pedunculis lateralibus.* Cardinal-flower with trailing stalks, spear-shaped sawed leaves, and foot-stalks proceeding from their sides.

The first sort grows naturally by the side of rivers and ditches in great part of *North America*, but has been many years cultivated in the *European* gardens for the great beauty of its scarlet flowers. The root is composed of many white fleshy fibres; the lower leaves are oblong, a little sawed, and of a dark purplish colour on their upper side; the stalks are erect, and rise about a foot and a half high, garnished with spear-shaped leaves, sawed on their edges, having very short foot-stalks, and are placed alternately; the stalk is terminated by a spike of flowers of an exceeding beautiful scarlet colour; these have a pretty long tube, which is a little incurved, but at the top is cut longitudinally into five segments; three upper, which are the smallest, are greatly reflexed; the three under, which form the lower lip, are larger, and spread open.

This is propagated by seeds, which, when they ripen in *England*, should be sown in autumn in pots, and placed under a common hot-bed frame; or, if the seeds come from the country, where the plants grow naturally, they should be sown in the same way, so soon as they arrive, for if they are kept out of the ground till spring, they will lie a year in the ground before they vegetate. The pots, in which these seeds are sown, should be exposed to the open air at all times, when the weather is mild, but they must be screened from the frost, and very hard rain in winter. In the spring the plants will appear, when they should have as much free air as possible in mild weather, and, if the spring proves dry, they must be frequently refreshed with water. As soon as they are fit to remove, they should be each planted in a separate small pot, and placed in the shade, till they have taken new root; then they may be placed where they may have the morning sun, in which situation they may remain till autumn. During the summer they must be duly watered in dry weather, and, when the roots have filled the pots, they should be removed into larger. In autumn they must be placed under a common frame, to screen them from hard frost, but they should enjoy the open air at all times, when the weather is mild. The spring following they should be new-potted, and placed where they may have the morning sun, always observing to water them duly in dry weather, which will cause their stalks

to be stronger, and produce larger spikes of flowers, which will continue long in beauty, if they are not too much exposed to the sun, and, if the autumn proves warm, the seeds will ripen well in *England*. The roots of this plant will sometimes last two or three years, and produce offsets for increase, but those will not flower so strong as the seedling plants, therefore an annual supply of them should be raised. There are many who propagate this plant by cutting their stalks into proper lengths, and plant them in pots filled with good earth, or into an east border, covering them close with glasses. These frequently take root, so produce young plants, but they are not so good as the seedlings.

The plants of this sort will live in the full ground, if they are protected from hard frost in winter, and they will flower stronger than those in pots.

The second sort grows naturally at *Campeachy*, from whence the late Mr. *Robert Millar* sent the seeds; this hath a fibrous root like the first. The stalks are much larger, and rise a foot higher; they are closely garnished with leaves, which are long, smooth, and entire, ending in acute points, and are terminated by short spikes of flowers, which are larger than those of the first sort, but are of the same beautiful scarlet colour.

This is propagated by seeds in the same way as the first, but the plants are not so hardy, therefore require to be placed in a moderate stove in winter, and in summer they should be placed in a deep frame, where they may be covered with glasses in bad weather, but enjoy the free air at all times, when the weather is favourable. With this management the plants flowered very well in the *Chelsea* garden, but they did not perfect seeds.

The third sort grows naturally in *Virginia*, but has been long an inhabitant of the *English* gardens; this hath a perennial fibrous root. The leaves are smooth, oval, spear-shaped, and a little indented on their edges; the stalks rise a foot and a half high, garnished with leaves like those at the bottom, which are gradually smaller to the top, sitting close to the stalk. The flowers come out from the wings of the leaves; they are of a pale blue colour, and have large empalements, whose edges are reflexed. The seeds frequently ripen in *England*.

It is propagated in the same way as the first sort, and the plants require the same culture.

The fourth sort grows naturally in *Jamaica*, from whence the late Dr. *Houssoun* sent the seeds; this is an annual plant. The stalk rises a foot high, then divides into four or five smaller, which grow erect. The lower part is garnished with heart-shaped smooth leaves, having small indentures on their borders, and stand upon short foot-stalks. The upper slender stalks are thinly garnished with small purplish flowers to the top, and are succeeded by small seed-vessels, which ripen in autumn. When the seeds are permitted to scatter on the pots which stand near them, and those are sheltered from the frost, the plants will come up plentifully the following spring, or, if they are sown in pots in autumn, and sheltered in the winter, the plants will arise the following spring, and these should be transplanted into separate small pots, placing them under a frame, where they will flower in *June* and *July*, and their seeds will ripen in *September*, when the plants will decay.

The fifth sort grows naturally in the forests about *Blois* in *France*; this is an annual plant. The root is composed of many fleshy fibres; the stalk rises about two feet high, garnished with spear-shaped leaves, which are very thin, and sawed on their edges, sitting close to the stalk; the upper part of the stalk is garnished with very small leaves; from their base arise the flowers, which are of a bright blue colour. These appear in *July*, and are succeeded by roundish seed vessels, with holes at the top, which are filled with small red seeds.

The seeds of this plant should be sown in autumn in pots filled with loamy earth, and placed under a hot-bed frame in winter, and, when the plants come up in the spring, they should be transplanted either into a border of soft loamy earth, or into separate pots, shading them till they have taken new root; afterward they must be duly watered in dry weather, which will cause them to flower strong, and produce good seeds annually.

The sixth sort grows naturally in *North America*; this is a biennial plant in *England*, which rarely flowers the same year as the plants come up, but decays soon after the seeds are ripe. The stalks of this are channelled and hairy; they grow erect to the height of two feet, garnished with thin oval leaves, sitting close to the stalk, of a light green, and a little sawed on their edges. The flowers stand upon long slender foot-stalks, which come out from the wings of the leaves, forming a loose spike, which terminate the stalk; they are small, and of a light blue colour. This is propagated by seeds, which should be sown in autumn, in pots filled with rich earth, and treated in the same way as the first sort.

The seventh sort grows naturally at the *Cape of Good Hope*. This is a biennial plant; the stalks rise a foot and a half high, covered with a hairy down, and are purplish toward the bottom; the leaves are oval, of a deep green colour, a little hairy on their under side, and sit close to the stalks. The flowers stand upon long slender foot-stalks, which come out from the bosom of the leaves, sometimes one proceeding from a joint, and at others they come out opposite on each side the stalk, each foot-stalk sustaining one pale blue flower, which being small makes but little appearance. This may be propagated in the same way as the first.

The eighth sort grows naturally in moist places, on most of the islands of the *West-Indies*. This is also a biennial plant, whose root is composed of a few strong ligneous fibres; the stalk rises about eight or nine inches high, is closely garnished with leaves on every side, which are hairy, very deeply indented on their edges, of a deep green, and sit close to the stalks. The flowers are white, and come out at every joint from the wings of the leaves, standing upon very short foot-stalks; the tube of the flower is from three to four inches long, very slender, and deeply cut at the top into five segments, which spread open, and are succeeded by turgid seed-vessels, crowned by the five segments of the petal, having three holes at the top, filled with small grayish seeds. The seeds of this sort should be sown soon after it is ripe, in pots filled with rich earth, and plunged into the tan-bed in the stove. In the spring these pots may be removed, and plunged into a hot-bed, which will soon bring up the plants; when these are fit to remove, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root; then they may be treated in the same way as other tender plants from the same country, giving them a large share of air in warm weather. In autumn the plants must be plunged into the tan-bed of the stove, where they will flower the following summer and produce ripe seeds, soon after which the plants will decay. If the seeds of this plant are brought from the *West-Indies*, they should be sown as soon as they arrive, in pots, and if it happens in the winter, the pots should be plunged into the tan-bed in the stove; but if it is in the spring or summer, they may be plunged into a hot-bed in the common frames. These seeds when sown in the spring, seldom grow the same year, therefore the following autumn the pots should be removed into the stove, and managed according to the above directions.

The ninth sort grows naturally at the *Cape of Good Hope*. This is an annual plant; the stalks are slender, branching,

and spread out on every side; they rise about a foot high, garnished with small spear-shaped leaves, which are indented on their edges, and sit close to the branches. The flowers are blue; they stand upon very slender long foot-stalks; and are succeeded by small roundish seed-vessels, filled with small seeds, which ripen in *September*. If the seeds of this sort are sown in autumn, they will succeed much better than when they are sown in spring; these may be sown in pots, and sheltered under a common hot-bed frame in winter, exposing them to the open air at all times in mild weather, but screening them from the frost; and in the spring, the pots should be plunged into a moderate hot-bed, which will soon bring up the plants; when these are fit to remove, they should be each planted in a separate small pot, and plunged into a moderate hot-bed again, shading them from the sun till they have taken new root; then they must have a large share of free air at all times when the weather is mild; and as the plants grow strong, they should be gradually hardened to bear the open air, into which they should be removed in *June*, placing them in a sheltered situation, where they will flower in *July*; and if the season proves favourable, the seeds will ripen in *September*, but if the season should prove cold, it will be proper to remove one or two plants into a glass-case, to obtain good seeds.

The tenth sort comes from the *Cape of Good Hope*. This hath trailing stalks; the leaves are sawed on their edges, and the foot-stalks come out from the side of the branches, in which it differs from the last. It may be propagated by seeds, and treated in the same manner as the last.

RAUVOLFIA. *Plum. Nov. Gen. 19. tab. 40.*

The Characters are,

The flower has a permanent empalement of one leaf, cut into five parts at the top. The petal is funnel-shaped, the tube is cylindrical, and is cut at the brim into five parts. It has five stamina, which are a little shorter than the tube, terminated by erect summits, and a roundish germen, supporting a short style, crowned by a headed stigma. The germen afterward becomes a globular berry, with two cells, inclosing one compressed seed in each.

The Species are,

1. RAUVOLFIA *foliis quaternis, ovato-lanceolatis subdentatis*. Rauwolfia with leaves placed by fours, which are oval, spear-shaped, and somewhat indented.

2. RAUVOLFIA *foliis quaternis lanceolatis integerrimis*. Rauwolfia with four spear-shaped entire leaves at each joint.

Both these sorts grow naturally in the warmest parts of *America*; Mr. Robert Millar sent the seeds of them from *Carthogena* in *New Spain*, where he observed the shrubs growing in great plenty. These rise with several ligneous stalks from the root, which grow ten or twelve feet high, sending out a few small side branches, covered with a smooth green bark when young, but as they are older, their bark changes to a gray. The leaves are placed by fours at each joint round the branches; those of the first sort are two inches and a half long, and an inch and a half broad in the middle; they are of a light green, and have a few slight indentures on their edges; the leaves of the other sort are full as long, but are a third part narrower, and of a thinner substance. These differences continue in the plants which are raised from seeds, for I have several times propagated them both from seeds, and have constantly found the seeds produce the same as the plants from which they were taken. The flowers are produced on slender foot stalks, which arise from the wings of the leaves; they are tubulous, globular at their base, and are succeeded by roundish berries about the size of those of the Privet, which turn black when ripe. These plants flower most part of summer, and the fruit ripens in autumn and winter; the leaves and stalks of these plants have a milky juice, which flows out if they are broken.

These plants are propagated by seeds, which should be sown in autumn soon after they are ripe, for if they are kept out of the ground till spring, the plants rarely come up the same year; and this is frequently the case with those seeds, which are brought to *England*.

The seeds should be sown in pots, and plunged into a hot bed of tanners bark, for as they are very hard, they frequently remain a long time in the ground; therefore when they are in pots, they may be shifted from one bed to another, as their heat decays. When the plants come up, they should have a large share of fresh air admitted to them in warm weather, and but little water. When they are about two inches high, they should be transplanted each into a separate small pot, and plunged into the hot-bed again, observing to shade them from the sun until they have taken new root; after which time they should have free air admitted to them every day, in proportion to the warmth of the season. In this hot-bed the plants may remain till toward *Michaelmas*, when they should be removed into the stove, and plunged into the tan-bed, where they must be kept warm, and not have too much moisture in cold weather.

As these plants are natives of very hot countries, they will not live in the open air in *England*, therefore they should constantly remain in the stove; and if they are continued in the bark-bed, they will thrive much faster than when they are placed on stands in a dry stove. But in the summer season they should have a large share of fresh air admitted to them, and the leaves of the plants must be now and then washed with a sponge, to clear them from the filth they are apt to contract, which, if suffered to remain, will retard the growth of the plants. Where due care is taken of them, they will thrive very fast; the second year they will produce flowers, and continue so to do for many years, and will perfect their seeds in *England*. They may also be propagated by cuttings, which should be laid to dry for two or three days before they are planted; and then should be plunged into a moderate hot-bed of tanners bark, observing to shade them until they have taken root, after which time they may be treated as the seedling plants.

RESEDA. *Tourn. Inst. R. H. 423. tab. 238.* Bastard-rocket. *Mignonette.* *Weld.*

The Characters are,

The empalement of the flower is cut into several parts almost to the bottom, and is permanent. The petals of the flower are unequal, generally trifid, and have a honey gland on their base, the length of the empalement. The honey glands are plain, erect, and produced from the upper side of the receptacle, between the stamina and the place of the upper petal, joining with the base of the petals, dilating from the sides. It hath fifteen or sixteen short stamina, terminated by erect obtuse summits, and a gibbous germen, sitting upon very short styles, crowned by a single stigma. The germen afterward becomes a gibbous angular capsule of one cell, with an aperture between the styles, filled with kidney-shaped seeds, fastened to the angles of the capsule.

The Species are,

1. RESEDA *foliis pinnatis, foliolis integris alternis floribus tetragynis*. Bastard-rocket with winged leaves, whose lobes are entire, placed alternate, and have four styles to the flower.

2. RESEDA *foliis omnibus trifidis, inferioribus pinnatis*. Hort. Cliff. 213. Bastard-rocket with all the leaves trifid, and the lower ones winged.

3. RESEDA *foliis integris trilobisque, calycibus maximis*. Hort. Cliff. 412. Bastard-rocket with entire trifid leaves, having the largest empalement.

4. RESEDA *foliis difformibus, dentatis floribus trigynis*. Bastard-rocket with difformed indented leaves, and flowers having three styles.

5. RESEDA

5. RESEDA *foliis pinnatis, floribus tetragynis*. Hort. Upsal. 149. Bastard-rocket with winged leaves, and flowers having four styles.

6. RESEDA *foliis integris trilobisque, floribus tetragynis*. Tab. 217. Bastard-rocket with entire and three-lobed leaves, and flowers having four styles; commonly called sweet Reseda, or *Mignonette d'Egypt*.

7. RESEDA *foliis subulatis sparsis*. Sauv. Monsp. 41. Bastard-rocket with awl-shaped leaves placed thinly.

8. RESEDA *foliis lanceolatis integris, calycibus quadrifidis*. Lin. Sp. Plant. 448. Bastard-rocket with spear-shaped entire leaves, and quadrifid empalements.

The first sort grows naturally in the south of *France, Italy, and Spain*. This is a biennial plant, which flowers and seeds the second year, and perishes soon after. The root is long, white, a little ligneous; the leaves are unequally winged and entire; the stalks are channelled, garnished with smaller winged leaves; they rise a foot and a half high, terminated by a long loose spike of pale yellow flowers, composed of several unequal petals; the two upper are the largest, the side ones less, and the lower are so small, as to be scarce conspicuous; they are all of a singular figure, and appear as if one leaf came out of two others. In the middle are situated many stamens, terminated by yellow summits; at the bottom a three-cornered germen, which afterward turns to a three-cornered seed-vessel, having three or four holes at the top, filled with black seeds.

The second sort grows naturally in chalky land, in many parts of *England*; the lower leaves of this are winged, and every lobe is cut into three smaller; they are curled on their edges, and have some small indentures. The stalks rise about the same height as the former, and are terminated by longer and looser spikes of flowers; the flowers are paler, and approach to a white.

The third sort grows naturally in the south of *France and Italy*. This is an annual plant, which has generally a single fleshy tap-root, running deep in the ground, sending out several trailing stalks near a foot long, which divide into smaller branches, garnished with small leaves, some of which are wedge-shaped and entire, others are cut into three obtuse parts. The end of the branches are terminated by loose spikes of flowers, standing upon pretty long foot-stalks. The empalement of the flower is large, divided into five segments almost to the bottom; the flowers are white, and shaped like those of the other sorts.

The fourth sort grows naturally in *Italy and Spain*. This is a biennial plant; the lower leaves are unequally winged, some of the intermediate lobes or segments being much less than the other, and of different shapes. The stalk rises a foot and a half high, garnished with smaller disformed winged leaves, indented on their edges. The flowers are produced in slender loose spikes at the top of the stalks; they are small and white, of the same shape with the others.

The fifth sort grows naturally in the south of *France*. It is a biennial plant; the lower leaves are large, winged, and composed of many narrow lobes or segments, placed alternate, which are of a grayish colour; the stalks rise two feet and a half high, garnished with the like leaves, which diminish in their size to the top; the stalks are terminated by shorter and thicker spikes of flowers than either of the former, which are white, and shaped like those of the other species.

The sixth sort is supposed to grow naturally in *Egypt*. The seeds of this were sent me by Dr. *Adrian Van Royen*, the late professor of botany at *Leyden*. The root of this plant is composed of many strong fibres, from which come out several stalks about a foot long, which divide into small branches, garnished with oblong leaves, some of which are entire, and others are divided into three parts, of a deep

green. The flowers are of an herbaceous white colour, produced in loose spikes at the end of the branches; they stand upon pretty long foot-stalks, and have large empalements, equal with the petals, and smell very like fresh Raspberries, which occasions its being much cultivated in the *English* gardens. This plant is so like the third sort, as to be taken for the same by some, but the flowers of the third have no scent; so that those who have been imposed on, by having the seeds of the third sort sent them for this, have supposed the plant was degenerated.

The seventh sort grows naturally upon the mountains in *Spain*. This hath a perennial root, from which arise a few slender ligneous stalks a foot and a half high, which are thinly garnished with linear obtuse leaves, of a grayish colour; the upper part of the stalk is garnished for a good length with small, whitish, purple flowers, ranged in a very loose spike, sitting close to the stalk.

The eighth sort grows naturally upon dry banks and old walls in many parts of *England*, but is cultivated in some places for the dyer's use. This is now generally believed to be the plant, with which the ancient inhabitants of this island painted themselves, and not the woad, as has been by some supposed; for the dyers weed is a native here, whereas the woad has been since introduced into this country. This is a biennial plant; the root is composed of a few ligneous fibres; the leaves are four inches long, and half an inch broad, entire, and ending in obtuse points; these the first year spread circularly near the ground, and have some gentle wavings on their edges; the stalks rise three feet high, garnished with leaves of the same shape with those at bottom. They are terminated by long loose spikes of yellowish flowers, which appear the latter end of *June*, and the seeds ripen in *September*.

The five sorts first mentioned, and also the seventh, are seldom cultivated in gardens, except for the sake of variety, having very little beauty to recommend them, and being of no use; but whoever has a mind to have them, need only sow their seeds in autumn, and when the plants come up, if they are thinned and kept clean from weeds, it is all the culture they require; or if their seeds are permitted to scatter, the plants will come up in plenty, and sometimes become troublesome weeds.

The seeds of the sixth sort should be sown on a moderate hot-bed in *March*, and when the plants are strong enough to transplant, they should be pricked out upon another moderate hot-bed to bring them forward; but the plants should have a large share of air in warm weather, otherwise they will draw up very weak. About the latter end of *May* the plants may be planted out, some into pots, to place near the apartments, and others into warm borders, where they may remain to flower and seed. For the plants which grow in the full ground, often produce more seeds than those which are in pots; but at the time when the seed-vessels begin to swell, the plants are frequently infested with green caterpillars, which, if they are not destroyed, will eat off all the seed-vessels.

If the seeds of this plant are sown on a bed of light earth in *April*, the plants will come up very well, and when they are not transplanted, will grow larger than those which are raised in the hot-bed, but they will not flower so early. The plants may be preserved through the winter in a green-house, where they will continue flowering most part of the year, but the second year they are not so vigorous as in the first.

The eighth sort is the weld, which is accounted a rich commodity for dyeing; where this is cultivated, the seeds are commonly sown with Barley in the spring, and after the Barley is taken off the ground, the weld begins to make some progress, and the next season is pulled up for use.

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This has been long practised, and it will be difficult to prevail on the cultivators of this plant to depart from their old customs; but if any person will follow the directions hereafter given, I can from experience promise them much better success.

The weld will grow upon very poor soil, but the crop will be in proportion to the goodness of the land, for upon very poor ground the plants will not rise a foot high, whereas upon good ground I have measured them upward of three feet, and the stalks, leaves, &c. have been in proportion; so that the better the soil is upon which it is sown, the greater will be the produce.

The best way to cultivate this plant, is to sow it without any other crop; if the ground is ready by the beginning or middle of *August*, that will be a good season; the land should be well ploughed and harrowed fine, but unless it is very poor, it will not require dung; when the ground is well harrowed and made fine, the seeds should be sown; one gallon of the seeds is sufficient to sow an acre of land, for they are small. If rain falls in a little time after the seeds are sown, it will bring up the plants, and in two months time they will be so far advanced, as to be easily distinguished from the weeds; then they should be hoed in the like manner as Turneps, always observing to do it in dry weather, for then the weeds will soon die after they are cut up; at this time the plants may be left about six inches distance; if this is done in dry weather, and the work well performed, the plants will be clean from weeds till the spring; but as young weeds will come up in *March*, so if in dry weather the ground is hoed again, it may be performed at a small expence while the weeds are young, then they will soon decay; and if after this there should be many more weeds appear, it will be proper to hoe it a third time, about the beginning of *May*, which will preserve the ground clean till the weld is fit to pull. The best time to pull the weld for use, is as soon as it begins to flower, though most people stay till the seeds are ripe, being unwilling to lose the seeds; but it is much better to sow a small piece of land with this seed, to remain for a produce of new seeds, than to let the whole stand for seed, because the plants, which are permitted to stand so long, will be much less worth for use than the value of the seeds; besides, by drawing off the crop early, the ground may be sown with Wheat the same season; for the plants may be drawn up the latter end of *June*, when they will be in the greatest vigour, so will afford a greater quantity of the dye.

When the plants are pulled, they may be set up in small handfuls to dry in the field, and when it is dry enough, it may be tied up in bundles and housed dry, being careful to stack it loosely, that the air may pass between to prevent its fermenting.

That which is left for seeds should be pulled as soon as the seeds are ripe and set up to dry, then beat out for use, for if the plants are left too long, the seeds will scatter. The usual price of the seed is ten shillings a bushel.

RHABBARUM. See Rheum.

RHABBARUM MONACHORUM. See Rumex.

RHAGADIOLUS. See Lapsana.

RHAMNOIDES. See Hippophæ.

RHAMNUS. *Tourn. Inst. R. H. 593. tab. 366.* The Buckthorn.

The Characters are,

It hath male and female flowers on different plants; these have no empalements according to some, or petals according to others. The cover of the sexes is funnel-shaped, cut into four parts at the top, which spread open. The male flowers have four stamina the length of the tube, terminated by small summits. The female flowers have a roundish germen, supporting a short style, crowned by a quadrifid stigma. The ger-

men afterward becomes a roundish berry, inclosing four hard seeds.

The Species are,

1. RHAMNUS *floribus axillaribus, foliis ovato-lanceolatis serratis nervosis.* Buckthorn with flowers proceeding from the sides of the branches, and oval, spear-shaped, sawed, veined leaves; the purging, or common Buckthorn.

2. RHAMNUS *floribus axillaribus, foliis ovatis acuminatis nervosis integerrimis.* Buckthorn with flowers proceeding from the sides of the branches, and oval, acute-pointed, entire leaves, having veins.

3. RHAMNUS *foliis lanceolatis, floribus axillaribus.* Buckthorn with spear-shaped leaves, and flowers growing from the sides of the stalks.

4. RHAMNUS *foliis cuneiformibus confertis perennantibus, floribus corymbosis alaribus.* Buckthorn with wedge-shaped ever-green leaves, growing in clusters, and flowers growing in roundish bunches from the sides of the branches.

The first sort grows naturally in the hedges in many parts of *England*; it rises with a strong woody stalk to the height of twelve or fourteen feet, sending out many irregular branches; the young shoots have a smooth, grayish, brown bark, but the bark of the older branches is darker and rougher, armed with a few short thorns. The leaves stand upon pretty long slender foot-stalks, of the oval spear-shape, sawed on their edges, of a dark green on their upper side, but of a pale or light green on their under, having a pretty strong midrib, and several veins proceeding from it. The flowers come out in clusters from the side of the branches; those of the male have as many stamina as there are divisions in the petal; those of the female have a roundish germen, which afterward turns to a pulpy berry, of a roundish form, inclosing four hard seeds.

The berries of this are used in medicine. From the juice of these berries is made a very fine green colour, called by the *French Verd-de-vestie*, which is much esteemed by the painters in miniature.

The second sort grows naturally in the south of *France*. This is an humble shrub, seldom rising more than three or four feet high, sending out many irregular branches, covered with a dark brown bark, garnished with oval leaves, ending in acute points; they are of a yellowish green, and a thin consistence, having several veins diverging from the midrib toward the sides. The flowers come out upon small curfons or spurs on the side of the branches, each standing upon a separate short foot-stalk, of a yellowish herbaceous colour, having short swelling tubes, cut into five acute segments at the top, which spread open; they appear in *June*, but are not succeeded by berries here.

Mr. *Du Hamel de Monceaux*, of the Royal Academy of Sciences at *Paris*, says, that the fruit of this species gathered green is the *Graine d'Avignon*, or *Avignon Berries*, which are used in dyeing of yellow; but I have been assured by a gentleman of skill who resided long in the south of *France*, that the *Avignon Berries* were the fruit of the narrow-leaved *Alaternus*; and in order to be satisfied of the truth, I gathered a quantity of the berries of the narrow-leaved *Alaternus* before they were full ripe, and carried them to two eminent dealers in this commodity, and asked them if they knew what those berries were; they both assured me, after making trial of them, that they were *Avignon Berries*, and if I had a large quantity of them, they would purchase them all; therefore, as the *Alaternus* before mentioned is one of the most common shrubs in the south of *France*, from whence the *Avignon Berries* are brought, we may suppose Mr. *Du Hamel* has been ill informed.

The third sort grows naturally in *Spain* and *Italy*. This grows to a larger size than the second, but not so high as the first. The branches are stronger, and armed with a few long

long spines; the leaves are like those of the wild Plum, but a little longer and narrower; the flowers are small, of a yellowish colour, and are produced from the side of the branches.

The first sort is so common in the hedges in many parts of *England*, that it is seldom cultivated in gardens. This rises easily from seeds, if they are sown in autumn soon after the berries are ripe, but, if they are kept out of the ground till spring, the plants will not come up till the year after; these will require no particular treatment, but may be managed in the same way as young Crabs, or any other hardy deciduous tree; it may also be propagated by cuttings or layers. If the young shoots are layed in autumn, they will put out roots by the following autumn, when they may be taken off from the plants, and either planted in a nursery to remain there to get strength for a year or two, or they may be planted where they are designed to remain. This is not so proper for hedges as the Hawthorn or Crab, so those should be preferred to it.

The two other sorts are preserved in botannick gardens for the sake of variety, but, as they are not beautiful, few persons cultivate them here. As these do not produce fruit in *England*, they are propagated either by laying down of the young branches in autumn, or by planting the cuttings in the spring, before the buds begin to swell. These will put out roots in the same manner as the common sort, and may be treated in the same way, for they are both hardy plants, and will thrive in the open air.

The fourth sort grows naturally at the *Cape of Good Hope*, so is too tender to thrive in the open air in *England*, but, if it is placed in a common green-house with Myrtles, Olives, and the hardier kinds of exotick plants in winter, and removed to the open air in summer, it will thrive very well. This rises with a shrubby stalk to the height of four or five feet, sending out many side branches, which, when young, are covered with a green bark, but, as they advance, the bark changes to a dark brown, armed with a few long slender thorns, and garnished with wedge-shaped leaves, which come out in clusters at each joint, four, five, or six rising from the same point, which differ in size; they are of a deep green, and continue all the year; their points are rounded, growing narrower to their base, fitting close to the branches. The flowers are produced on the side of the branches at each joint; they are collected into roundish bunches, standing upon foot-stalks an inch long; they are white, and have short tubes; their upper part is cut into five acute segments, which spread open in form of a star. These appear in *June*, at which time the whole shrub seems covered with flowers, so as to make a fine appearance; and, as the leaves continue green all the year, it deserves a place where there is a conveniency to shelter them in winter.

This sort has not as yet produced seeds in *England*, but it may be easily propagated by cuttings, which should be planted in pots the beginning of *April*. The pots should be plunged into a moderate hot-bed, and the cuttings should be shaded from the sun in the heat of the day; but they must by no means have too much wet. These cuttings will put out roots in about six weeks; then they must have a large share of air admitted to them, and gradually inured to bear the open air, into which they should be soon after removed; when they are well hardened, they may be shaken out of the pots, and separated, being careful to preserve a ball of earth to each, and plant them into single pots, placing them in the shade till they have taken new root; then they may be removed into a sheltered situation, where they may remain till the frost comes on in autumn, at which time they must be housed, and treated in the same way as the other hardier kinds of green-house plants.

RHEUM. *Lin. Gen. Plant.* 454. The Rhubarb,

The Characters are,

The flower has no empalement; it hath one petal, which is narrow at the base, and impervious. The brim is cut into six parts, which are obtuse and alternately smaller; it hath nine hair-like stamina inserted in the petal, and is of the same length, terminated by oblong twin summits, which are obtuse, and a short three-cornered germen, with scarce any style, crowned by three-feathered stigmas, which are reflexed. The germen afterward becomes a large three-cornered seed, with acute membranaceous borders.

The Species are,

1. RHEUM *foliis cordatis glabris, spicis compactis obtusis.* Rhubarb with smooth heart-shaped leaves, and obtuse compact spikes of flowers.

2. RHEUM *foliis subvillosis, petiolis æqualibus.* *Lin. Diff.* 1. *tab. 1. Sp. Plant.* 372. Rhubarb with hairy leaves, having equal foot-stalks.

3. RHEUM *foliis cordatis glabris, marginibus sinuatis, spicis divisis nutantibus.* *Tab.* 218. Rhubarb with heart-shaped smooth leaves, which are sinuated on their borders, and divided spikes of flowers which nod.

4. RHEUM *foliis granulatis, petiolis æqualibus.* *Lin. Sp. Plant.* 372. Rhubarb with granulated leaves, having equal foot-stalks; called by the *Arabians* Ribes.

The first sort grows naturally near the *Pontick Sea*, but has been long an inhabitant of the *English* gardens. When the seeds were first brought to *Europe*, they were supposed to be of the true Rhubarb, but upon making trial of the roots, they were found to be greatly inferior to those of the true Rhubarb; and upon examination it was found to be the Rhapontick of *Prosper Alpinus*, commonly called *Pontick Rhubarb*. This hath a large thick root, which divides into many less running deep in the ground; the outside is of a reddish brown colour, and the inside yellow, from which arise several leaves in number according to the size of the root; these come up folded in the spring, and afterward expand themselves; they are of a roundish heart-shape, smooth, having very thick foot-stalks of a reddish colour, which are a little channelled on their lower side, but flat at the top. When the plant grows in rich land, the foot-stalks of the leaves are near two feet long, and thicker than a man's thumb; the leaves also are often two feet long, and as much in breadth, having several strong longitudinal veins running from the foot-stalk to the borders; they are of a deep green, a little waved on their edges, and have an acid taste, but particularly the foot-stalks, which are now frequently used for making of tarts. From between the leaves arise the flower-stem, which is of a purple colour, garnished with one leaf at each joint, of the same shape with those below, but smaller, and sit close to the stalk. The stalks grow from two to three feet high, according to the strength of the ground, and are terminated by thick close obtuse spikes of white flowers; these are succeeded by large triangular brown seeds, having a border or wing at each angle, which ripen in *August*.

The seeds of the second sort were sent me from *Leyden* by the late *Dr. Boerhaave*, by the title of *Rhabarbarum Chinense verum*, or true *China Rhubarb*, which succeeded in the *Chelsea* garden. The root of this sort divides into a greater number of thick fibres than those of the first, which run deeper into the ground, and are of a deeper yellow within. The leaves appear much earlier in the spring; the foot-stalks are not so much channelled on their under side, and are plain on their upper; they are not so red nor so thick. The leaves are longer, running more to a point, and are waved on their edges, are a little hairy on their upper side, and have many strong veins or ribs on their under. The flower-stem is of a pale brownish colour, rising about four feet high, dividing into several loose panicles

panicles or bunches of white flowers, which are succeeded by triangular seeds, like those of the first sort, which ripen earlier in the season.

The seeds of the third sort were sent me from *Petersburgh*, for the true *Tartarian* Rhubarb. The roots of this sort are large, and do not divide into so many parts as those of the second, and are yellower within; the leaves appear as early in the spring; the foot-stalks of these are of a pale green, almost as large as those of the first sort; they have scarce any channels, and are flat on their upper side; the leaves are heart-shaped, smooth; they do not run out to so great length in a point as the second, but are longer than those of the first; they are very broad toward their base, and have very large pale green ribs on their under side, a little waved on their edges, and have a sharp acid flavour. The flower-stalk is a pale green; it rises four feet high, as large as a common walking cane, garnished at each joint by one leaf, of the same shape with those below, but smaller, sitting close to the stalk; the upper part of the stalk divides into small branches, which are again divided into less, each sustaining a panicle or spike of white flowers, which are succeeded by large triangular bordered seeds, like those of the first sort.

The roots of this last approach nearer to those of the foreign Rhubarb, than either of the other, both in shape and quality; and as the seeds which were sent to *Petersburgh*, were gathered from the plants growing on the spot where the Rhubarb is taken up, so there is little reason to doubt of its being the true sort, though the roots which have grown in *England*, have not been equal in quality with those of the foreign; but this may have been occasioned for want of age, or by being taken out of the ground at an improper season; therefore farther trials may improve it, and as the plants produce great plenty of seeds here, so they may be propagated with great ease.

It has been learnedly controverted by the botanists, whether the Rhapontick of the ancients, and the Rhubarb of the moderns, is one and the same plant, some affirming, and others denying that there is any agreement; the reasonings on both sides may be seen in the appendix to the second volume of *John Bauhin's* History of Plants.

The fourth sort grows naturally on *Mount Libanus*, and other mountainous parts of *Syria*. This hath a thick fleshy root, which runs pretty deep in the ground, from which arise several leaves in the spring, which come up folded together, and afterward expand; they have very short foot-stalks, so spread near the ground, but during the spring their borders are erect, and form a sort of hood, having several folds, curled and waved on their edges; they are of a purplish green, and have purple veins and borders; their surface appears studded with rough protuberances; when the leaves are fully expanded in summer, they are a foot long, and above two feet broad; their under side is paler than the upper, and their borders appear fringed. I have not seen this plant in flower, but the seeds of it were brought from *Mount Libanus*, by the Right Rev. Dr. *Pococke*, the present bishop of *Ossory*; these were large, covered with a succulent pulp, of a deep red colour, and very astringent taste; this succulent covering may have occasioned its being taken for a berry, by many of the old writers; the shape of the seed is like that of the other species.

These plants are all propagated by seeds, which should be sown in autumn soon after they are ripe; then the plants will come up the following spring; but if they are kept out of the ground till spring, the plants will not come up till the next spring, so that a whole year will be lost. The seeds should be sown where the plants are designed to remain, for as their roots are large and fleshy, so when they are transplanted, they do not recover their removal in less

than two years; nor will the roots of those plants which are transplanted, ever grow so large and fair, as those which remain where they were sown. When the plants appear in the spring, the ground should be hoed over to cut up the weeds, and where the plants are too close, some should be cut up, to allow room for the others to grow, in the same manner as is practised for Carrots and Parsneps, leaving them at the first time of hoeing six or eight inches asunder, for fear of accidents, but at the second time of hoeing they may be separated to a foot and a half distance or more. After this the plants will require no other culture, but to keep them clean from weeds, so that as soon as the weeds appear, if the ground is scuffled over with a *Dutch* hoe in dry weather, it may be done for a small expence, and thereby the ground will be kept clean. If this is begun early in the spring before the weeds are large, they will soon die, and by repeating it two or three times at proper intervals, during the spring, the ground will be made clean; and when the plants spread out their leaves to cover the ground, they will prevent the growth of weeds.

In autumn the leaves of these plants decay; then the ground should be made clean, and in the spring before the plants begin to put up their new leaves, the ground should be hoed and made clean again; the second year after the plants come up, many of the strongest will produce flowers and seeds, but the third year most of them will flower. The seeds of these should be carefully gathered when ripe, and not permitted to scatter, lest they should grow to injure the old plants. The roots of these plants will remain many years without decaying, and I am informed, that the old roots of the true Rhubarb are much preferable to the young ones. They delight in a rich soil, not too dry nor over moist, and where there is a good depth for their roots to run down in such land, their leaves will be very large, and their roots will grow to a great size.

The first sort is now frequently cultivated in gardens for the foot-stalks of their leaves, which are peeled and made into tarts in the spring: it is also kept in gardens, to supply the shops with the roots, which are used in medicine.

The true Rhubarb is now sown in many gardens, and may probably succeed so well here in time, as that a sufficient quantity of that valuable drug may be raised, to supply our consumption.

RHEXIA. *Gron. Flor. Virg.* 41.

The Characters are,

The empalement of the flower is permanent, oblong, tubulous, and of one leaf, divided into four parts at the trim. The flower has four roundish petals inserted in the empalement. It hath eight slender stamina, which are inserted in the empalement, terminated by declining furrowed summits. It has a roundish germen, supporting a declining style the length of the stamina, crowned by a thick oblong stigma. The germen afterward becomes a roundish capsule, with four cells in the swollen empalement, opening with four valves, filled with roundish seeds.

The Species are,

1. RHEXIA *calycibus glabris. Flor. Virg.* 41. Rhexia with smooth empalements.

2. RHEXIA *foliis ciliatis. Lin. Sp. Plant.* 346. Rhexia with fine hairy leaves.

The first sort was discovered by Mr. *Banister* in *Virginia*, from whence he sent the seeds to *England*, which succeeded in several gardens. This rises with an erect stalk near a foot and a half high, is four-cornered and hairy, garnished with hairy spear-shaped leaves, placed opposite. The stalk has two foot-stalks coming out from the side opposite, at the upper joint, and is terminated by two other; these each sustain two or three red flowers with heart-shaped petals, which spread open in form of a cross.

The second sort grows naturally in *Maryland*, from whence I received the seeds. This sends up an erect stalk about ten inches high, garnished with spear-shaped leaves, set on by pairs; from every joint of the stalk comes out two short shoots opposite, garnished with small leaves of the same shape; the whole plant is covered with stinging iron-coloured hairs. The stalk divides at the top into two foot-stalks, spreading from each other, having one reddish flower on each; these have four heart-shaped petals, which spread open like the other. These plants are propagated by seeds, which must be procured from the places where they grow naturally. If the seeds arrive before the spring, and are sown soon after they arrive, in pots filled with good fresh earth, and placed under a garden-frame to guard them from frost, the plants will come up the following spring; but when the seeds are sown in the spring, the plants rarely come up the first year. When the plants come up and are fit to remove, part of them should be planted in an east border, where they may have only the morning sun, and the other may be planted into pots, that they may be sheltered under a frame in winter, for they are sometimes destroyed by severe frost, though they will live abroad in the common winters very well; the second year the plants will flower, and with care they may be continued three or four years.

RHINANTHUS. *Lin. Gen. Plant.* 658. Rattle, or Lousewort.

There are several species of this genus which grow naturally in moist meadows in many parts of *Europe*, one of which is very common in *England*, where it is one of the most troublesome weeds among the Grass, spreading itself over the whole ground, so that in many of the water meadows, there is more of this plant than Grass. It is an annual plant, which flowers the latter end of *May*, so that the seeds ripen by the time the Grass of these meadows is mowed, and the seeds scatter and fill the ground with young plants the following spring; therefore, in order to destroy it, the Grass should be cut as soon as the flowers of this plant appear.

These plants are with great difficulty kept in gardens; they are biennial, so are only propagated by seeds; these should be sown soon after they are ripe, otherwise they will not succeed, nor will the plants bear removing, therefore should be sown where they are to remain, which should be in a moist rich soil and a shady situation: when the plants come up, they must be thinned and kept clear from weeds, which is all the culture they require. If the seeds of these plants are permitted to scatter, the plants will come up better than those which are sown by hand.

RHIZOPHORA. *Lin. Gen. Plant.* 524. This is called Mangrove by the inhabitants of the *West-Indies*; there are several species of this genus which grow in salt water rivers, both in the *East* and *West-Indies*, but as they will not grow upon land, it is needless to enumerate them here.

RHODIOLA. *Lin. Gen. Plant.* 997. Rose-root.

The Characters are,

It hath male and female flowers in different plants; the male flowers have an empalement of one leaf, cut into four or five segments almost to the bottom; they have four obtuse petals, and four nectariums, which are erect and shorter than the empalement, with eight awl-shaped stamina, which are longer than the petals, terminated by obtuse summits. They have four oblong acute germen, without style or stigma, so are abortive. The female flowers have the same empalement as the male; they have four obtuse petals equal with the empalement, and have four nectariums like the male, with four oblong acute-pointed germen sitting upon an erect style, crowned by obtuse stigmas. The germen afterward become four horned capsules, compressed on their inner side, filled with roundish seeds.

The Species are,

1. **RHODIOLA** *staminibus corollâ duplo longioribus.* Rose-root with stamina twice as long as the petals.

2. **RHODIOLA** *staminibus corolla fere æquantibus.* Rose-root with stamina scarcely equalling the length of the petals.

The first sort grows naturally in the clefts of the rocks and rugged parts of the mountains of *Wales*, *Yorkshire*, and *Westmoreland*. This has a very thick fleshy root, which, when bruised or cut, sends out an odour like *Roses*; it has many heads, from whence in the spring come out thick succulent stalks like those of *Orpine*, about nine inches long, closely garnished with thick succulent leaves, of a gray colour, which are indented on their edges toward the top, and are placed alternately on every side the stalk. The stalk is terminated by a cluster of yellowish herbaceous flowers, which appear early in *May*; the male flowers have stamina twice the length of the petals. They have a very agreeable scent, but are not of long continuance.

The second sort grows naturally on the *Alps*; the roots of this are smaller than those of the other sort; the stalks are small, not above nine inches long; the leaves are small, but shaped like those of the other sort; the petals of the flowers are purplish, and the stamina are but little longer than the petals. This flowers later than the other sort.

These plants are preserved in the gardens of the curious, for the sake of variety; they are easily propagated by parting of the roots, which should be performed the beginning of *September*, at which time their stalks begin to decay; and if the fleshy parts of the roots are cut or broken, they should be laid to dry a few days before they are planted. These plants require a shady situation and a dry undunged soil, in which they will continue many years.

RHODODENDRON. *Lin. Gen. Plant.* 484. Dwarf Rose-bay.

The Characters are,

The flower has a permanent empalement cut into five parts; the flower hath one wheel funnel-shaped petal, spreading open at the brim; it has ten slender stamina which decline, and are the length of the petals, terminated by oval summits, and a five-cornered germen, supporting a slender style the length of the petal, crowned by an obtuse stigma. The germen afterward becomes an oval capsule with five cells, filled with small seeds.

The Species are,

1. **RHODODENDRON** *foliis ciliatis nudis, corollis infundibuliformibus.* *Lin. Sp. Plant.* 292. Rose-bay with naked hairy leaves, and funnel-shaped petals.

2. **RHODODENDRON** *foliis glabris, subtus leprosis, corollis infundibuliformibus.* *Lin. Sp. Plant.* 392. Rose-bay with smooth leaves, which are hoary on their under side, and have funnel-shaped petals.

3. **RHODODENDRON** *foliis nitidis ovalibus margine acuto reflexo.* *Lin. Sp.* Rose-bay with neat oval leaves, sharply reflexed on their border.

The first sort grows naturally on the *Alps*, and several mountains in *Italy*. This is a low shrub, which seldom rises two feet high, sending out many short ligneous branches, covered with a light brown bark, garnished closely with oval spear-shaped leaves, sitting pretty close to the branches; they are entire, have a great number of fine iron-coloured hairs on their edges and under side. The flowers are produced in bunches at the end of the branches, having one funnel-shaped petal; the tube is about half an inch long; the brim is cut into five obtuse segments, which spread half open; they are of a pale red colour, and have ten stamina in each, which are the length of the tube; after the flowers are past, the germen in the center turns to an oval capsule with five cells, filled with small seeds.

The second sort grows naturally on the *Alps* and *Apennines*. This rises with a shrubby stalk near three feet high,

sending out many irregular branches, covered with a purplish bark, closely garnished with smooth, spear-shaped, entire leaves, whose borders are reflexed backward; the upper side is of a light lucid green, their under side of an iron colour; they are placed all round the branches, without any order. The flowers are produced in round bunches at the end of the branches; they are funnel-shaped, having short tubes cut into five obtuse segments at the brim, which spread a little open; they are of a pale Rose colour, and make a good appearance.

The third sort is a very beautiful shrub, especially where it thrives well, and produces many flowers; but there are few soils and situations in this country which agrees well with it, so the shrubs are of short duration. This grows naturally in many parts of *North America*, where there are usually several stems arising from one root, which grow ten or twelve feet high; the leaves are as large as those of the Laurel, and of as thick consistence, continuing green the whole year. The flowers are produced in roundish bunches at the extremity of the former year's shoots; they are of a pale Rose colour, studded with spots of a deeper red. The tube of the flower is bent, somewhat like those of ringent flowers, in which it chiefly differs from the *Kalmia*; the stamina also incline to one side of the tube, with the style situated between them. When these shrubs are adorned with several bunches of flowers, there are very few flowering-shrubs can be compared with these for beauty.

There are some other species of this genus, which grow naturally in the eastern countries, and others are natives of *America*; but the sorts here mentioned are all I have seen in the *English* gardens; these are difficult to propagate and preserve in gardens, for they grow naturally upon barren rocky soils and in cold situations, where they are covered with snow great part of the winter; so that when they are planted in better ground, they do not thrive, and for want of their usual covering of snow in winter, they are frequently killed by frost; but could these plants be tamed, and propagated in plenty, they would be great ornaments to the gardens.

They are propagated by seeds, but these are so very small, that if they are covered deep, they will not grow. The seeds should be sown as soon as possible, after they are ripe, in pots filled with fresh gentle loamy earth, and very lightly covered with a little fine earth; then the pots should be plunged up to their rims in a shady border, and in hard frost they should be covered with bell or hand-glasses, taking them off in mild weather. If these seeds are sown early in autumn, the plants will come up the following spring; these must be kept shaded from the sun, especially the first summer, and duly refreshed with water; in autumn following they may be transplanted to a shady situation, on a loamy soil, covering the ground about their roots with Moss, which will guard them from frost in winter, and keep the ground moist in summer.

Plants of the third sort are frequently brought to *England* from *North America*, but as many of these are unskillfully taken up from the places where they naturally grow, which is in thickets, so that their roots intermix, which renders it more difficult to get them up with good roots, and coming in the winter, many of the plants fail, and those which do live, rarely continue in health many years, especially if the plants are large; therefore those persons who collect these shrubs to send to *England*, should make choice of such as are of two or three years growth, and of those plants which have come from seeds, rather than suckers from older plants; or if they would collect the seeds, and sow them immediately in a garden, on a proper soil, they might raise good plants for the purpose; which is very difficult to do in *England*, for the seeds seldom arrive here till toward

spring, so do not grow the first year; and when the plants do come up, it is very difficult to keep them alive the two first years.

RHUS. *Tourn. Inst. R. H. 611. tab. 381. Sumach.*

The Characters are,

The empalement of the flower is permanent, erect, and cut into five parts. The flower has five oval, erect, spreading petals, and five short stamina, terminated by small summits; it has a roundish germen as large as the petals, with scarce any style, crowned by three small stigmas. The germen afterward becomes a roundish hairy berry, inclosing a single hard seed of the same form.

The Species are,

1. RHUS foliis pinnatis obtusiusculè serratis, ovato-lanceolatis subtus villosis. Sumach with winged leaves, which are obtusely sawed, ovally spear-shaped, and hairy on their under side; Elm-leaved Sumach.

2. RHUS foliis pinnatis integerrimis, cordato-oblongis acuminatis, ramis petiolisque villosissimis. Sumach with entire winged leaves, which are oblong, heart-shaped, end in acute points, having very hairy branches and foot-stalks; *Virginian* Sumach.

3. RHUS foliis pinnatis serratis, lanceolatis utrinque glabris. Sumach with winged leaves, which are spear-shaped, and smooth on both sides.

4. RHUS foliis pinnatis serratis lanceolatis, subtus incanis, paniculâ compactâ. Sumach with sawed, spear-shaped, winged leaves, which are hoary on their under side, with a compact panicle.

5. RHUS foliis pinnatis, obsolete serratis, lanceolatis, utrinque glabris, paniculâ compositâ. Sumach with winged spear-shaped leaves, which are slightly sawed, and a compound panicle.

6. RHUS foliis pinnatis integerrimis, petiolo membranaceo articulato. *Flor. Leyd. Prod. 24.* Sumach with entire winged leaves, and a jointed membranaceous foot-stalk; narrow-leaved Sumach.

7. RHUS foliis pinnatis, foliolis ovatis, obtusè serratis, petiolo membranaceo villoso. Sumach with winged leaves, oval lobes, which are bluntly sawed, and a hairy foot-stalk, having jointed membranes or wings.

8. RHUS foliis ternatis, foliolis ovatis subtus tomentosis. Three-leaved Sumach with oval leaves, which are downy on their under side.

9. RHUS foliis ternatis, foliolis subpetiolatis, rhombeis angulatis, subtus tomentosis. *Lin. Sp. Plant. 266.* Three-leaved Sumach with angular rhomboid lobes, having foot-stalks downy on their under side.

10. RHUS foliis ternatis, foliolis sessilibus cuneiformibus lævibus. *Vir. Cliff. 25.* Three-leaved Sumach, whose lobes are smooth, wedge-shaped, and sit close to the stalk.

11. RHUS foliis ternatis, foliolis ovatis nervosis, marginibus sepius dentatis, utrinque viridibus. Sumach with trifoliate leaves, having oval veined lobes, which are generally indented on their edges, and green on both sides.

12. RHUS foliis ternatis, foliolis petiolatis lineari-lanceolatis integerrimis, subtus tomentosis. *Hort. Cliff. 111.* Sumach with trifoliate leaves, whose lobes stand upon foot-stalks, are linear, spear-shaped, entire, and downy on their under side.

13. RHUS foliis ternatis, lineari-lanceolatis integerrimis sessilibus utrinque viridibus. Sumach with trifoliate leaves, having linear, spear-shaped, entire lobes, sitting close to the foot-stalk, green on both sides.

14. RHUS foliis ternatis, foliolis ovatis acuminatis integerrimis, petiolatis, floribus paniculatis terminalibus. Three-leaved Sumach with oval acute-pointed lobes, which are entire, upon foot-stalks, and flowers growing in panicles, which terminate the branches.

15. *RAUS foliis simplicibus obovatis. Lin. Sp. Plant. 267.* Sumach with single, obverse, oval leaves; *Venice* Sumach, or *Coccygia*.

The first sort of Sumach grows naturally in *Italy, Spain, and Turkey*. The branches of this tree are used instead of Oak for tanning of leather, and I have been informed that the *Turkey* leather is all tanned with this shrub. This has a ligneous stalk, which divides at bottom into many irregular branches, which rise to the height of eight or ten feet; the bark is hairy, of an herbaceous brown colour; the leaves are winged, composed of seven or eight pair of lobes, terminated by an odd one, bluntly sawed on their edges, are hairy on their under side, of a yellowish green colour, and placed alternately on the branches; the flowers grow in loose panicles at the end of the branches, which are of a whitish herbaceous colour, each panicle being composed of several spikes of flowers sitting close to the foot-stalks. The leaves and seeds of this sort are used in medicine, and are esteemed very restraining, stiptick, and good for all kinds of fluxes and hæmorrhages; used both inwardly and outwardly they resist putrefaction, and stop gangrenes and mortifications.

The second sort grows naturally in almost every part of *North America*. This hath a woody stem, with many irregular branches, which are generally crooked and deformed. The young branches are covered with a soft velvet-like down, resembling greatly that of a young stag's horn both in colour and texture, from whence the common people have given it the appellation of stag's-horn; the leaves are winged, composed of six or seven pair of oblong heart-shaped lobes, terminated by an odd one, ending in acute points, hairy on their under side, as is also the midrib. The flowers are produced in close tufts at the end of the branches, and are succeeded by seeds, inclosed in purple, woolly, succulent covers, so that the bunches are of a beautiful purple colour in autumn; and the leaves, before they fall in autumn, change to a purplish colour at first, and, before they fall, to a Feuilemort. This shrub is used for tanning of leather in *America*, and the roots are often prescribed in medicine in the countries where the plant grows naturally.

The third sort grows naturally in many parts of *North America*; this is commonly titled by the gardeners *New England* Sumach. The stem of this sort is stronger, and rises higher than that of the former; the branches spread more horizontally; they are not quite so downy as those of the last, and the down is of a brownish colour; the leaves are composed of many more pair of lobes, which are smooth on both sides; the flowers are disposed in loose panicles, which are of an herbaceous colour.

The fourth sort grows naturally in *Carolina*; the seeds of this were brought from thence by the late Mr. *Catesby*, who has given a figure of the plant in his *Natural History of Carolina*. This is by the gardeners called the *Scarlet Carolina* Sumach; it rises commonly to the height of seven or eight feet, dividing into many irregular branches, which are smooth, of a purple colour, and pounced over with a grayish powder, as are also the foot-stalks of the leaves. The leaves are composed of seven or eight pair of lobes, terminated by an odd one; these are not always placed exactly opposite on the midrib, but are sometimes alternate. The upper side of the lobes are of a dark green, and their under hoary, but smooth. The flowers are produced at the end of the branches in very close panicles, which are large, and of a bright red colour.

The fifth sort grows naturally in *Canada, Maryland, and* several other parts of *North America*. This hath smooth branches, of a purple colour, covered with a gray pounce. The leaves are composed of seven or eight pair of lobes,

terminated by an odd one; the lobes are spear-shaped, sawed on their edges, of a lucid green on their upper surface, but hoary on their under, and are smooth. The flowers are produced at the end of the branches in large panicles, which are composed of several smaller, each standing upon separate foot-stalks; they are of a deep red colour, and the whole panicle is covered with a gray pounce, as if it had been scattered over them.

The sixth sort grows naturally in most parts of *North America*, where it is known by the title of *Beech* Sumach, probably from the places where it grows. This is of humbler growth than either of the former, seldom rising more than four or five feet high, dividing into many spreading branches, which are smooth, of a light brown colour, closely garnished with winged leaves, composed of four or five pair of narrow lobes, terminated by an odd one; they are of a light green on both sides, and in autumn change purplish. The midrib, which sustains the lobes, has on each side a winged or leafy border, which runs from one pair of lobes to another, ending in joints at each pair, by which it is easily distinguished from the other sorts. The flowers are produced in loose panicles at the end of the branches, of a yellowish herbaceous colour.

These six sorts are hardy plants, and will thrive in the open air here. The first and fourth sorts are not quite so hardy as the others, so must have a better situation, otherwise their branches will be injured by severe frost in the winter; they are easily propagated by seeds, which, if sown in autumn, the plants will come up the following spring, but if they are sown in the spring, they will not come up till the next spring; they may be either sown in pots, or the full ground. If they are sown in pots in autumn, the pots should be placed under a common frame in winter, where the seeds may be protected from hard frost; and in the spring, if the pots are plunged into a very moderate hot-bed, the plants will soon rise, and have thereby more time to get strength before winter. When the plants come up, they must be gradually hardened to bear the open air, into which they should be removed as soon as the weather is favourable, placing them where they may have the morning sun; in the summer, they must be kept clean from weeds, and in dry weather watered; toward autumn it will be proper to stint their growth by keeping them dry, that the extremity of their shoots may harden, for if they are replete with moisture, the early frosts in autumn will pinch them, which will cause their shoots to decay almost to the bottom, if the plants are not screened from them. If the pots are put under a common frame in autumn, it will secure the plants from injury, for while they are young and soft, they will be in danger of suffering, if the winter proves very severe; but in mild weather they must always enjoy the open air, therefore should never be covered but in frost. The spring following, just before the plants begin to shoot, they should be shaken out of the pots, and carefully separated, so as not to tear the roots, and transplanted into a nursery in rows three feet asunder, and one foot distance in the rows. In this nursery they may stand two years to get strength, and then may be transplanted where they are to remain.

This method of propagating the plants from seeds is seldom practised after a person is once possessed of the plants, for they are very subject to send up a great number of suckers from their roots, whereby they are easily propagated. The suckers of all the sorts may be taken up, and planted in a nursery for a year or two to get strength, and then may be planted where they are to remain.

These shrubs are generally planted in plantations of flowering shrubs in large gardens, where they make a fine variety in autumn, especially the second, fourth, and fifth

forts, with their large purple or red panicles, which have a good effect; but, where these are planted, their suckers should be every year taken off, otherwise they will grow up to a thicket, and destroy the old plants.

The seventh fort grows naturally in the east. The seeds of this were sent to the Royal Garden at *Paris*, where they succeeded; and from thence I received the plant, which grew very well in the open air at *Chelsea* three years, but the severe winter in 1740 destroyed it, so that it is not quite so hardy as the other forts. This rises with a shrubby stalk six or eight feet high, sending out many irregular branches. The young shoots and foot-stalks of the leaves are covered with a soft, brown, hairy down; the leaves are composed of three or four pair of oval lobes, terminated by an odd one; the inner lobes are small, the outer large; the end lobe is heart-shaped, ending in an acute point; they are sawed on their edges, and are hoary on their under side; the midrib, which sustains the lobes, has two leafy membranes running along the sides from joint to joint, which are narrow below, and gradually increase in their breadth to the next joint. When the leaves are broken, they emit a milky juice from the wound. As I have not seen the flowers of this fort, I can give no account of them.

This does not put out suckers from the root so freely as the *American* kinds, so must either be propagated by layers, or cutting off some of the roots, and planting them upon a gentle hot-bed; by which method it may be propagated, but my plant was too weak for this purpose, when it was destroyed.

The eighth fort grows naturally at the *Cape of Good Hope*. This hath a strong woody stalk, which rises ten or twelve feet high, covered with a gray bark, sending out many smooth branches, garnished with trifoliate leaves, standing upon pretty long foot-stalks. The lobes of the leaves are oval, entire, hoary on their under side, but smooth, and of a lucid green on their upper; the flowers are produced from the wings of the leaves in small bunches; they are of an herbaceous colour.

The ninth fort also grows naturally at the *Cape of Good Hope*. This rises with a woody stalk to the height of seven or eight feet, covered with a brown bark, putting out many irregular branches, garnished with trifoliate leaves, standing upon long foot-stalks. The lobes of this fort are angular, shaped like a rhombus, downy on their under side, but of a dark green on their upper. The flowers come out in slender bunches from the side of the branches, of a whitish herbaceous colour, and soon fall away.

The tenth fort grows naturally at the *Cape of Good Hope*. This rises with a woody stalk like the eighth, dividing into many branches, covered with a brown bark, garnished with trifoliate leaves, whose lobes are wedge or heart-shaped, of a lucid green, and sit close to the foot-stalk. This fort does not flower here, so far as I can find, for I have had some of the plants in my care above forty years, but they have not flowered as yet.

The eleventh fort is a native of the *Cape of Good Hope*. This hath some resemblance of the former, but the lobes of the leaves are twice as large, and are oval, with some indentures on their edges; they have several transverse veins running from the midrib to the edges, and are very stiff, of a bright lucid green on both sides. This fort has not flowered here so far as I can learn.

The twelfth fort came from the *Cape of Good Hope*, where it grows naturally. This rises with a woody stalk seven or eight feet high, dividing into several irregular branches, covered with a dark brown bark, garnished with narrow, spear-shaped, trifoliate leaves, standing upon pretty long foot-stalks, downy on their under side, but of a lucid green on their upper. The flowers are small, of an herbaceous

colour, and are produced in small loose bunches from the side of the branches.

The thirteenth fort is a native of the *Cape of Good Hope*. This rises with an upright woody stalk five or six feet high, sending out many branches, covered with a smooth brown bark, garnished with narrow, spear-shaped, trifoliate, entire leaves, standing upon short foot-stalks, of a lucid green, and have a deep furrow lengthways through the middle. This fort has not yet flowered in *England*.

All these *African* forts are too tender to live through the winter in the open air in *England*, so they are planted in pots or tubs, and housed in autumn; during the winter they must be treated in the same way as other hardy green-house plants. They all retain their leaves through the year, so make a good variety when intermixed with other plants in the green-house in winter. They may be propagated by cuttings, which should be planted in pots the beginning of *April*, and plunged into a very moderate hot-bed, covering them close with hand or bell-glasses, screening them from the sun in the heat of the day. The cuttings should be now and then refreshed with water, but it should not be given in too great quantity. If they succeed, they will put out roots in about two months; when they begin to shoot, they should be gradually hardened to bear the open air, into which they must be removed, placing them in a sheltered situation; when the cuttings have filled the pots with their roots, they should be shaken out, and parted carefully, planting each into a separate small pot, placing them in the shade till they have taken new root, when they may be intermixed with other exotick plants in a sheltered situation for the summer, and in autumn removed into the green-house.

The fourteenth fort grows naturally in the island of *Ceylon*. This rises with a woody stalk ten or twelve feet high, clothed with trifoliate leaves, standing upon pretty long foot-stalks. The lobes of the leaves are oval; they are thick, smooth, and of a lucid green. The flowers are small, of an herbaceous colour, and are produced in loose panicles at the end of the branches. These seldom appear in *England*.

This plant is tender, so must be placed in a moderate stove, otherwise it will not live through the winter in *England*. It may be propagated by cuttings in the same way as the former forts, but requires a warmer bed than those to promote their putting out roots. When they have good roots, they should be each transplanted into a separate small pot, and plunged into the tan-bed, and treated in the same way as other tender exotick plants.

The fifteenth fort grows naturally in *Spain*, *Italy*, and the *Levant*, where the leaves are used for tanning of leather; this rises with an irregular shrubby stalk to the height of ten or twelve feet, sending out many spreading irregular branches, covered with a smooth brown bark, garnished with single, obverse, oval leaves, rounded at their points, which stand upon long foot-stalks; they are smooth, stiff, and of a lucid green, having a strong midrib, from whence several transverse veins run toward the border. The flowers come out at the end of the branches upon long hair-like foot-stalks, which divide, and branch into large hair-like bunches, of a purplish colour; they are small, white, and composed of five small oval petals, which spread open.

This plant is cultivated for sale in the nursery-gardens near *London*; it is propagated by layers, which should be laid down in autumn, and by next autumn they will have taken root, when they may be taken off from the old plants, and transplanted in a nursery, where they may grow a year or two to get strength, and then be planted where they are to remain. This shrub is so hardy, as not to be injured by frost in *England*.

RIBES. *Lin. Gen. Plant.* 247. The Currant-tree.

The Characters are,

The flower has a bellied empalement, cut at the top into five concave obtuse segments; it hath five small, obtuse, erect petals, growing to the border of the empalement, and five awl-shaped stamina inserted in the empalement, terminated by incumbent compressed summits. The roundish germen is situated under the flower, supporting a bifid style, crowned by obtuse stigmas, which afterwards becomes a globular umbilicated fruit, with one cell, containing many roundish compressed seeds.

The Species are,

1. RIBES *inermis, racemis glabris pendulis, floribus planiusculis.* *Lin. Sp. Plant.* 200. Currant without thorns, smooth hanging bunches, and plain flowers; common Currant.

2. RIBES *inermis, racemis erectis, bracteis flore longioribus.* *Lin. Sp. Plant.* 200. Smooth Currant with erect bunches, and bractæ longer than the flower; sweet Alpine Currant.

3. RIBES *inermis, racemis pilosis, floribus oblongis.* *Lin. Sp. Plant.* 201. Currant without spines, having hairy branches and oblong flowers; black Currant.

4. RIBES *inermis, racemis glabris, floribus campanulatis.* Currant with unarmed smooth branches, and bell-shaped flowers.

The first sort grows naturally in the northern parts of Europe, but has been long cultivated in the gardens, and greatly improved, so that at present there are the following varieties in the English gardens, viz. the common Currant with small red fruit, the same with white fruit, and another with pale fruit, which is commonly called the *Champaign* Currant; but, since the two sorts of *Dutch* Currants have been introduced, and become plenty in the gardens, the old red and white Currants have been almost banished, so that they are rarely to be found in the English gardens at present.

The second sort is kept in a few gardens for the sake of variety, but, as the fruit is very small, and has little flavour, it is not much cultivated.

The third sort grows naturally in *Helvetia*, *Sweden*, and other northern countries, and is sometimes cultivated in gardens for its fruit, of which is made a rob, which is greatly esteemed for sore-throats, from whence the fruit has been called *Squinancy Berries* for their great use in quinsies. As this fruit has a strong disagreeable flavour, it is rarely admitted to the table.

The fourth sort grows naturally in *Pennsylvania*, from whence the plants were sent to Mr. *Peter Collinson* several years past, and has been dispersed to most parts of *England*. This has been by some thought to be the same with the common black Currant, but those who have long cultivated it, know it is very different. The shoots of this being much smaller and more compact, the bark is of a darker colour; the leaves are smaller, thinner, smoother, and have not a rank smell like those of the common sort. The flowers are smaller, bell-shaped, and grow in thinner bunches; the fruit is smaller, and not so round; the plants of this do not produce much fruit, nor is it so good as to merit cultivation, so the plant is only kept by way of curiosity. The fruit of the red and white Currants are greatly esteemed for the table, and are also very good in fevers; they are cooling and grateful to the stomach, quench thirst, and are somewhat restraining. The jelly made with the juice of this fruit and sugar is very grateful in fevers, and is used as sauce to the table. This fruit may be procured good much longer than most others upon the plants by planting them in different situations, for if they are planted against pales or walls exposed to the south, the fruit will ripen in *June*, and by planting some against north walls, if they are screened from birds, and covered in autumn from frost, they may be kept till *November*, and, as the fruit is greatly used for tarts, it is very convenient to have a succession of it for so long a time.

The *Champaign* Currant differs from the other only in the colour of the fruit, which is of a pale red or flesh colour. The taste is so near to the other, as not to be distinguished, but, this being of a different colour, makes a variety on the table.

There are plants of all these sorts with variegated leaves, which are kept in some gardens for the sake of variety, but, as these variegations go off when the plants are vigorous, they scarce deserve notice.

These sorts may be easily propagated by planting their cuttings any time from the middle of *September* to the end of *October*, upon a spot of fresh earth, either in rows at one foot asunder, or in beds, which in the spring must be kept very clear from weeds. These may remain one or two years in the nursery, during which time they must be pruned up for the purposes designed, i. e. either to clear stems about one foot high, if for standards, or, if for walls, pales, or espaliers, they may be trained up flat: then they should be planted out where they are to remain, for the younger they are planted the better they will succeed; the best season for which is soon after the leaves begin to decay, that they may take root before winter, so that they may be in no danger of suffering from drought in the spring.

These plants are generally planted in rows at about ten feet asunder, and four distance in the rows in those gardens, where the fruit is cultivated for sale; but the best method is to train them against low espaliers, in which manner they will take up much less room in a garden, and their fruit will be much fairer.

The distance they should be placed for an espalier, ought not to be less than ten or twelve feet, that their branches may be trained horizontally, which is of great importance to their bearing.

Those that are planted against pales or walls, should also be allowed the same distance. If they are planted against a south-east wall or pale, it will cause their fruit to ripen at least a fortnight or three weeks sooner than those in the open air, and those which are planted against a north wall or pale, will be proportionably later, so that by this method the fruit may be continued a long time in perfection, especially if those against the north pales are matted in the heat of the day.

These plants produce their fruit upon the former year's wood, and also upon small snags which come out of the old wood; so that in pruning them, these snags should be preserved, and the young shoots shortened in proportion to their strength. The only method, very necessary to be observed in pruning of them, is, not to lay their shoots too close, and never to prune their snags to make them smooth. This, with a small care in observing the manner of their growth, will be sufficient to instruct any person how to manage this plant, so as to produce great quantities of fruit.

These plants will thrive and produce fruit in almost any soil or situation, and are often planted under the shade of trees; but the fruit is always best when they are planted in the open air, and upon a light loamy soil.

RICINOIDES. See *Iatropha*.

RICINUS. *Tourn. Inst. R. H.* 532. tab. 307. *Palma Christi*, vulgò.

The Characters are,

It hath male and female flowers disposed in the same spike. The male flowers, which are situated on the lower part of the spike, have swelling empalements cut into three parts. The flowers have no petals, but have a great number of slender stamina, which are connected in several bodies, and are terminated by roundish twin summits. The female flowers, which are situated on the upper part of the spike, have empalements cut into five segments, and are armed with prickles; they have no petals, but

in the center is situated an oval germen, which is closely shut up in the empalement, supporting three short styles, which are bifid, crowned by single stigmas. The germen afterward turns to a roundish fruit, having three furrows, divided into three cells, opening with three valves, each cell containing one almost oval seed.

The Species are,

1. *RICINUS foliis peltatis serratis, subtus glaucis, petiolis glanduliferis.* Ricinus with target-shaped sawed leaves, which are gray on their under side, and foot-stalks bearing glands.

2. *RICINUS foliis peltatis subserratis, lobis amplioribus utrinque virentibus.* Ricinus with target-shaped leaves, which are somewhat sawed, whose lobes are large, and green on both sides.

3. *RICINUS foliis peltatis inaequaliter serratis, capsulis bifidis.* Tab. 219. Ricinus with target-shaped leaves, which are unequally sawed, and prickly capsules to the fruit.

4. *RICINUS foliis peltatis serratis, capsulis rugosis non echinatis.* Tab. 220. *Palma Christi* with target-shaped sawed leaves, and rough capsules to the fruit, which are not prickly.

5. *RICINUS foliis peltatis serratis, lobis maximis, caule geniculato, capsulis echinatis.* Ricinus with target-shaped sawed leaves, having the largest lobes, a jointed stalk, and prickly covers to the seeds.

6. *RICINUS foliis peltatis serratis, lobis maximis, caule geniculato, capsulis inermis.* *Palma Christi* with sawed target-shaped seeds, having very large lobes, a jointed stalk, and smooth covers to the seeds.

7. *RICINUS foliis palmatis serratis, profundius divisis, capsulis echinatis.* Ricinus with hand-shaped sawed leaves, which are deeply divided, and prickly covers to the seeds.

8. *RICINUS foliis palmatis serratis, profundius divisis, capsulis inermis.* *Palma Christi* with hand-shaped sawed leaves, which are deeply divided, and smooth covers to the seeds.

The first sort grows naturally in *Sicily*, and other warm parts of *Europe*. This rises with a strong herbaceous stalk to the height of ten or twelve feet; the joints are at a great distance from each other; the stalk and branches are of a gray colour; the leaves are large, and have long foot-stalks; they are deeply divided into seven lobes, which are sawed on their edges, and are gray on their under side; at the division of the lobes is a sort of navel, where the foot-stalk joins the leaves. The flowers are disposed in long spikes, which arise at the division of the branches; the lower part of the spikes are garnished with male flowers, which have swollen empalements, divided into three parts, which open, and shew a great number of slender stamina, terminated by whitish summits, connected at their base into several small bunches. The female flowers, which occupy the upper part of the spike, have prickly empalements, which inclose the roundish germen, upon which sit three short styles, crowned by oblong stigmas. The germen afterward becomes an oval capsule with three deep channels, closely armed with soft spines, and divided into three cells, each containing one oblong striped seed.

The second sort grows naturally in the islands of the *West-Indies*, where it is called *Agnus Castus*, or *Oil-tree*. This is often confounded with the former; most of the botanists suppose they are the same plant; but as I have cultivated both more than forty years, in which time I have never observed either of them vary, so I think there can be no doubt of their being different plants. This hath brown stalks, which rise six or seven feet high; the leaves are broader, and not so deeply divided as those of the former; they are of a deep green on both sides, and are unequally sawed. The spikes of flowers are shorter, the seed-vessels rounder, and of a brownish colour; and the seeds are much less, and of a reddish brown colour.

The third sort grows naturally in the *West-Indies*, and is often confounded with the former, but is very different. The stalk of this sort is thick, herbaceous, and of a grayish green; the joints are closer than those of the former sorts; it rises about four feet high; the leaves are large, of a deep green on their upper side, but grayish on their under; they are deeply cut into six or seven lobes or segments, which are unequally sawed on their edges. The spikes of flowers are loose, the covers of the capsules are green, and closely armed with soft spines; the seeds are smaller and lighter coloured than those of the second sort.

The fourth sort grows naturally in both *Indies*. This rises with an herbaceous stalk about four feet high; the lower part is purplish, the upper of a deep green; the joints of this are pretty far asunder; the leaves are of a deep green on their upper side, but are paler on their under; they are not so deeply divided as some of the other sorts, and are more regularly sawed; the spikes of flowers are large. The male flowers have more stamina, and their summits are yellow; the capsules are oval and rough, but have no spines; the seeds are small, and of a brown colour.

The fifth sort grows naturally in *Africa* and both the *Indies*. This rises with a large reddish stalk to the height of ten or twelve feet, with many joints; the leaves are the largest of any species yet known; I have measured some of them which were more than two feet and a half diameter; they are of a dark green, unequally sawed on their edges, and not so deeply cut as those of some other sorts. The spikes of flowers are large; the empalement of the flower is brown; the summits on the stamina of the male flowers are whitish; the capsules are large, oval, and closely armed with soft spines; the seeds are very large, and beautifully striped.

The sixth sort grows naturally in the *Spanish West-Indies*, from whence the late Mr. *Robert Millar* sent me the seeds. The plants of this sort are in every respect like those of the fifth, but the capsules which inclose the seeds are smooth; and this difference is permanent, therefore may be put down as a distinct species.

The seventh sort grows naturally in *Carolina*, and several other parts of *America*. Of this there are two varieties, if not distinct species; one of them has a red stalk, and the other a pale green; they are distinguished by the inhabitants of *America*, by the title of red and white Oil seed. The stalks of these seldom rise more than three feet high, divided at the top into two or three branches; the leaves are much less than those of the other sorts, and deeper divided; their borders are unequally sawed; the segments of the leaves are frequently cut on their sides. The spikes of flowers are smaller and more compact than those of the former sorts; the capsules are smaller, rounder, and of a light green, and are closely armed with soft spines; the seeds are small, and are finely striped.

The eighth sort grows naturally in the *Spanish West-Indies*, and also at the *Cape of Good Hope*. This is a lower plant than the seventh sort; the stalks are of a brownish colour; the leaves are small, deeply cut, and sawed on their edges; the spikes of flowers are short, the capsules are smooth, and the seeds are small and finely striped.

There are several other species which grow naturally in both *Indies*, which have not been examined by any curious botanist; for I have received seeds of three or four sorts, which appeared to be very different from any of the known sorts, but the seeds were too old to grow.

The sorts here enumerated, I have cultivated several years, and have always found they have kept their difference, so that I have no doubt of their being distinct species; and unless they are thus tried, there is no possibility of determining their specific difference; for when plants are

found growing in different soils and situations, they have such different appearances, as may deceive the most skilful botanist.

The plants are generally annual in these countries, though in their native places of growth they continue longer; in *England* the plants are often preserved through the winter (especially the first sort) but young plants are much preferable to those which are thus preserved; therefore few persons are at the trouble to keep them, unless when the seasons prove so bad as that their seeds do not ripen, whereby the species might be lost, if the plants are not preserved through the winter.

These plants are propagated by seeds, which must be sown upon a hot-bed in the spring, and when the plants are come up, they should be each planted into a separate pot, and plunged into a fresh hot-bed. As these plants grow very fast, their roots will in a short time fill the pots; therefore they should be shifted into larger, toward the latter end of *May*; when the season is warm, they may be hardened to the open air by degrees; and then if some of the plants are shaken out of the pots, and planted out into a very rich border, and in dry weather duly watered, they will grow to a very large size, particularly the first and fifth sorts, which I have seen upward of ten feet high in one season, and these plants have produced a great quantity of flowers and seeds; but if you intend to preserve any of the plants through the winter, they must be shifted into larger pots from time to time, as their roots shall require, placing them in the open air during the summer season in some warm situation, where they may remain until the middle or end of *October*, when they must be removed into the house with other exotick plants, observing to water them sparingly in winter, and also to admit the free air in mild weather; for they only require to be protected from frost and cold winds, so that they will endure the winter in a warm green-house, without any addition of artificial warmth.

These plants deserve a place in every curious garden for the singular beauty of their leaves (notwithstanding their flowers make no great appearance), especially those sorts which may be propagated every year from seeds, because those persons who have no green-house to place them into in winter, may cultivate them as other annual plants; amongst which these, being placed either in pots or borders, afford an agreeable variety; but it must be observed, as these are large growing plants, never to place them too near other plants of less growth, because these will overbear and destroy them; and those which are planted in pots, should be allowed room for their roots to expand, and must be frequently watered, otherwise they will not grow very large.

The inhabitants of the *West-Indies* draw an oil from the seeds of these plants, which serves for the use of their lamps; and as the plants come up as weeds in those warm countries, so they are at no trouble to cultivate the plants, but employ their negroes to collect the seeds from the plants which grow naturally, whereby they are furnished with the oil at a small expence. This oil is good to kill lice in childrens heads.

The seeds of the first sort is the *Cataputia major* of the shops; these have been formerly given by some persons to purge watery humours, which they do both upward and downward with great violence, so that at present these seeds are rarely used.

RIPENING of FRUIT early.

In order to have early fruit, a wall should be erected ten feet high, in length according to the numbers of trees intended for three years forcing; the method of constructing these walls, is fully explained under the article WALL.

This being done, a border may be marked out about four feet wide on the south-side of it, and some scantlings of wood, about four inches thick, must be fastened on a low wall, built to prevent the earth of the border from falling into the walk, and also to secure the timber from rotting, to rest the glass-lights upon; which lights are to slope backward to the wall, to shelter the fruit as there shall be occasion.

Bars about four inches wide, cut out of whole deal, must be placed between these glasses, so that the lights may rest on them. There must also be a door shaped to the profile of the frame at each end, that it may be opened at either of the ends, according as the wind blows.

The frame before-mentioned should be made so, that when the first part has been forced, the frame may be moved the next year forward, and the succeeding year forward again, so that the trees will be forced every third year; and having two years to recover themselves, will continue strong for many years.

These trees should be well grown before they are forced, otherwise they will soon be destroyed; and the fruit produced on grown trees, will be much fairer and better tasted, than on fresh planted trees.

The fruit which may be planted in these frames are,

The Avant, the *Albemarle*, the Early *Newington*, and Brown Nutmeg Peaches.

Mr. *Fairchild's* Early, the *Elruge* and *Newington* Nectarines; the Masculine Apricot; the *May Duke* and *May Cherry*.

As for Grapes, the White Chasselas and Black Sweet-water.

It has been found by experience, that the trees will be injured if the heat be applied before *January*; and that the time for applying the heat for bringing either Duke or *May* Cherries, is about the beginning of that month, and applying heat at the same time would do for Apricots; so that the Masculine Apricot will, by the beginning of *March*, be as large as Duke Cherries, and will be ripe by the beginning of *May*.

Cherries thus forced, will not hold so well as Apricots, though the former will last, perhaps, for seven years in good plight, but Apricots will thrive and prosper thus many years.

Fairchild's Early Nectarine commonly ripens about the end of *May*, if they are forced at the same time, and the *Brugnon* Nectarine will follow that.

As for the distance of these trees one from another, it need not be so great as is directed for those planted in the open air, because they will never shoot so vigorously nor last so long, therefore eight or nine feet will be sufficient.

The trees against that part of the wall, which is designed for forcing, should be pruned as soon as their leaves begin to decay, that the buds on the branches, which are left, may be benefited, by receiving all the nourishment of the branches, whereby they will become turgid and strong, by the time the walls are heated.

Apricots, Grapes, Nectarines, Peaches, and Plums, if *April* proves cold, the forcing heat must be continued till *May* is settled, to keep the fruit growing; but some of the glasses should be opened in the morning in *March* and *April*, when the wind is still and the sun warm; and they should be permitted to receive the showers that fall, while the fruit is growing; but while they are in blossom, no rain should come near them, because, if there should be any moisture lodged in the bosom of the flowers, and the sun should shine hot through the glasses, it would be apt to destroy them.

Another thing which ought to be observed in planting fruit in these frames is, to plant those fruits which come forward together, and those which come late by themselves, because

because it will be prejudicial to the forward fruit, to give them any more heat when they have done bearing, when at the same time the latter fruits set amongst them may require more heat, and to be continued longer, some of them, perhaps, requiring an artificial heat till *May*.

There may also a row or two of scarlet Strawberries be planted near to the back of this frame, and these you may expect will be ripe by the end of *March*, or beginning of *April*.

As for the Vines, they may probably be brought to blossom in *April*, and have ripe Grapes in *June*.

RIVINIA. *Plum. Nov. Gen.* 48. *tab.* 39.

The Characters are,

The empalement of the flower is permanent, composed of four oval, concave, coloured leaves. The flower has no petals; it has eight stamina, which are longer than the empalement, terminated by small oval summits, and a large roundish germen, supporting a short style, crowned by an obtuse stigma. The germen afterward turns to a roundish berry sitting in the empalement, including one hard seed.

The Species are,

1. RIVINIA *foliis lanceolatis petiolatis integerrimis, caule fruticoso ramoso*. Rivinia with spear-shaped entire leaves, having foot-stalks, and a shrubby branching stalk.

2. RIVINIA *scandens racemosa, amplis solani foliis, baccis violaceis*. *Plum. Nov. Gen.* 48. Climbing branching Rivinia, with Nightshade leaves, and Violet-coloured berries.

The first sort rises with shrubby stalks about four feet high, dividing into several spreading branches, covered with a gray spotted bark, garnished with spear-shaped entire leaves, standing upon long slender foot-stalks; they are smooth, of a lucid green, and pretty thick consistence, standing alternate, at pretty great distances on the branches. The flowers are produced in long bunches from the side and at the end of the branches, each standing upon a slender foot-stalk near half an inch long; these have no petals, but their empalements are of a scarlet colour; within these are situated eight stamina, which are longer than the empalement, terminated by small oval summits; in the center is situated a roundish germen, terminating in a point, supporting a short style. The germen turns to a roundish berry with a thin pulp, surrounding one roundish hard seed; these berries are of a scarlet colour when ripe, and afterward change to a purple; they are by the inhabitants called Currants, but are generally esteemed poisonous.

The second sort rises with a climbing woody stalk to the height of twenty feet, covered with a dark gray bark, garnished with oval spear-shaped leaves; they are smooth and entire. The flowers come out in long bunches from the side of the branches, shaped like those of the other, and are succeeded by blue berries about the same size as those of the former. This sort grows naturally in *Antigua*, from whence I have received the seeds; it was also found growing at the *Havannah*, by the late *Dr. Houstoun*, who found the first growing in *Jamaica*.

They are both propagated by seeds, which remain long in the ground before they vegetate; I have had them lie two years before the plants have appeared, but they never rise the same year the seeds are sown.

These berries should be sown in pots, and plunged into a moderate hot-bed. As the plants will not come up the same year, so the pots should be removed into the stove before winter, and plunged into the tan-bed; during the winter season, the earth must be sometimes refreshed, but must not be too moist. In the spring the pots may be taken out of the stove, and plunged into a fresh hot-bed to bring up the plants; but if they should not then rise, the earth must not be disturbed, because the plants may come up the following season.

When the plants come up and are fit to remove, they

should be each transplanted into a separate small pot, and plunged into a hot-bed, and must be treated in the same way as other plants from the same countries.

They retain their leaves all the year, so make a variety in the stove in winter, and when they flower, make a fine appearance, though their flowers are but small; for as they are produced in long bunches, from almost every joint toward the end of the branches, so the whole plant is well adorned during their continuance.

ROBINIA. *Lin. Gen. Plant.* 775. False Acacia.

The Characters are,

The empalement of the flower is small, and divided into four parts, the three under segments being narrow, but the upper one is broad. The flower is of the Pea-bloom kind; the standard is large, roundish, obtuse, and spreads open. The two wings are oval, and have short appendixes, which are obtuse. The keel is roundish, compressed, obtuse, and is extended the length of the wings. In the center is situated ten stamina, nine joined together, and the other standing single, terminated by roundish summits. It hath an oblong cylindrical germen, supporting a slender style, crowned by a hairy stigma. The germen afterward becomes an oblong compressed pod, inclosing kidney-shaped seeds.

The Species are,

1. ROBINIA *pedunculis racemosis, foliis impari-pinnatis*. *Hort. Upsal.* 212. Robinia with foot-stalks supporting long bunches of flowers, and unequal winged leaves; common Bastard Acacia, called in *America* Locust-tree.

2. ROBINIA *pedunculis racemosis, foliis impari pinnatis, leguminibus echinatis*. Robinia with foot-stalks supporting long bunches of flowers, unequal winged leaves, and prickly pods.

3. ROBINIA *foliis impari-pinnatis, foliolis ovatis, racemis pedunculisque hispidis*. Robinia with unequal winged leaves, having oval lobes, whose branches and foot-stalks of the flowers are armed with stinging spines; false Acacia, with a Rose-coloured flower.

4. ROBINIA *foliis impari-pinnatis, foliolis ovatis acuminatis, ramis nodosis glabris, pedunculis racemosis*. Robinia with unequal winged leaves, whose lobes are oval and acute-pointed, knobbed smooth branches, and flowers growing in long bunches.

5. ROBINIA *foliis impari-pinnatis, foliolis oblongo-ovatis, pedunculis racemosis confertis*. Robinia with unequal winged leaves, having oblong oval lobes, and foot-stalks with long bunches of flowers growing in clusters.

6. ROBINIA *foliis impari-pinnatis, foliolis obversè-ovatis, racemis aggregatis axillaribus, leguminibus membranaceo-tetragonis*. Robinia with unequal winged leaves, whose lobes are obversely oval, long bunches of flowers growing in clusters from the sides of the branches, and pods having four-winged membranes.

7. ROBINIA *foliis duplicato-pinnatis, foliolis ovatis sessilibus, floribus spicatis terminalibus*. Robinia with doubly-winged leaves, whose lobes are oval, sit close to the midrib, and spikes of flowers terminating the branches.

8. ROBINIA *foliis pinnatis, foliolis lanceolatis oppositis, racemis axillaribus pedunculis longioribus*. Robinia with winged leaves, having spear-shaped lobes, placed opposite, and long bunches of flowers on the sides of the branches, upon longer foot-stalks.

9. ROBINIA *foliis impari-pinnatis, foliolis oblongis acuminatis, racemis axillaribus, leguminibus oblongo-ovatis*. Robinia with unequal winged leaves, having oblong acute-pointed lobes, and bunches of flowers proceeding from the sides of the branches.

10. ROBINIA *pedunculis simplicibus, foliis quaternatis petiolatis*. *Hort. Upsal.* 212. Robinia with single foot-stalks, and leaves growing by fours upon foot-stalks.

The first sort is the common false Acacia, which is a native of *North America*. The seeds of this were first brought to *Paris* from *Canada* by *Mons. Robine*, and soon after the seeds were brought from *Virginia* to *England*, where the trees were raised in several gardens, which for some years, while young, were in great esteem; but as they grew larger, their branches were frequently broken by strong winds in the summer, which rendered them unightly, so that for several years they were seldom planted in gardens; but of late years it is become fashionable again, and great numbers of the trees have been raised, so at present there are few gardens in which there are not some of these trees planted.

This sort grows to a very large size in *America*, where the wood is much valued for its duration; most of the houses which were built at *Boston* in *New England*, upon the first settling of the *Englifs*, was with this timber, which continues very sound at this time.

It grows very fast while young, so that in two or three years from seed, the plants will be eight or ten feet high; and it is not uncommon to see shoots of this tree six or eight feet long in one summer. The branches are armed with strong crooked thorns, garnished with winged leaves, composed of eight or ten pair of oval lobes, terminated by an odd one; they are of a bright green, entire, and sit close to the midrib. The flowers come out from the side of the branches in pretty long bunches, hanging downward like those of *Laburnum*, each flower standing on a slender foot-stalk. They are of the butterfly or Pea-blossom kind, white, and smell very sweet. They appear in *June*, and when the trees are well charged with flowers, they make a fine appearance, and their odour perfumes the circumambient air; but they are of short duration, seldom continuing more than one week in beauty; after the flowers fade, the green becomes oblong compressed pods, which in warm seasons come to perfection in *England*, but ripen pretty late in the autumn.

The leaves of this tree do not come out till late in the spring, and they fall off pretty early in the autumn, which renders it less valuable than it would otherwise be, were their leaves of longer duration.

The second sort is less common than the first. There was a large tree of this kind some years growing in the garden of the bishop of *London* at *Fulham*, which produced plenty of seeds. The pods of this sort are much shorter, and closely beset with short prickles, but in other respects agrees with the first sort.

The third sort grows naturally in *Carolina*, where it sometimes rises to the height of twenty feet, but in *England* at present, it seems to be of low growth; the branches spread out near the ground, and produce their flowers very young, which is a sure sign of its not growing tall here. The branches of this tree, and also the foot-stalks of the flowers, are closely armed with small brown spines, like some sorts of *Roses*; the leaves are like those of the first sort, but their lobes are larger and rounder. The flowers come out in bunches like those of the former, but are larger and of a deep *Rose* colour.

The fourth sort grows naturally at *Campeachy*, from whence the late *Dr. Houfoun* sent the seeds. This rises with a strong woody stem to the height of thirty or forty feet, sending out many strong branches on every side, which have large swelling knots, and are closely garnished with single winged leaves, composed of eight or nine pair of oval lobes, ending in points, terminated by an odd one; these are curiously marked with purple spots on their under side, which appear faintly on their upper. The flowers are produced in long close spikes, standing almost erect; they are about half the size of the flowers of the last sort, and are of a fine *Rose* colour.

The fifth sort was found growing naturally at *Campeachy* by the late *Dr. Houfoun*. This rises with a woody branching stalk twelve or fourteen feet high; the old branches are covered with a dark brown bark, but the young shoots and the foot-stalks of the flowers are covered with an iron-coloured down; the leaves are unequally winged; the lobes are oblong, obtuse, and of a pretty thick consistence; they are smooth on their upper side, but have several transverse veins on their under. The flowers are produced at the end of the branches in long close bunches; there are six or seven of them gathered together in clusters. The flowers are but small, and are of a yellowish red colour; the pods of this are like those of the first sort.

The sixth sort grows naturally in *Jamaica*, where the inhabitants give it the appellation of *Dogwood*. This hath a strong woody stem, which rises forty feet high, and divides into many branches, covered with a dark brown spotted bark, garnished with unequal winged leaves, composed of three or four pair of obverse oval lobes, terminated by an odd one. The flowers come out in branching bunches from the side of the branches; these generally appear at a time when the trees are destitute of leaves, and as they have large clusters of flowers at every joint, so the trees seem covered with them. The bunches at the extremity of the branches are the largest, and are formed pyramidally. The flowers are but small, and do not open so fully as those of the first sort, but are of a pale *Rose* colour, so make a fine appearance; these are succeeded by pods, having four broad membranaceous wings running longitudinally at their four corners, and join at their base, covering the pods entirely; each of the pods contain four or five oblong kidney-shaped seeds.

The seventh sort was discovered by *Plumier*, in some of the *French* settlements of the *West-Indies*, and was found by the late *Dr. Houfoun* growing naturally at *Campeachy*. This rises with a strong woody stem near thirty feet high, sending out many spreading branches, covered with a light gray bark, spotted with white, garnished with double winged leaves, whose lobes are oval, and sit close to the midrib; they are of a lucid green on their upper side, but of a pale green on their under. The flowers are produced in long loose pyramidal bunches toward the end of the branches, those on the lower part of the bunch having long foot-stalks, which diminish gradually to the top, so as to form a pyramid; these bunches are almost erect. The flowers are of a scarlet colour, so make a fine appearance.

The eighth sort was found growing naturally at *Campeachy* by the late *Dr. Houfoun*. This rises with a woody stem to the height of twenty feet, covered with a very light gray bark, garnished with equal winged leaves, composed of ten or eleven pair of oval lobes, placed opposite, of a lucid green on the lower part of the branches, but those toward the end are covered with a soft iron-coloured down. The flowers come out in long bunches from the side of the branches; they are blue, and stand upon long foot-stalks; these are succeeded by pods, shaped like those of the first sort, but are downy.

The ninth sort was discovered by the late *Dr. Houfoun* growing naturally at *Campeachy*. This rises with a strong woody stem upward of thirty feet high, dividing at the top into many strong branches, covered with a dark grayish bark, spotted with white, garnished with winged leaves, composed of six or seven pair of lobes, terminated by an odd one, of a lucid green on their upper side, but pale on their under. The flowers are produced in long loose bunches from the side of the branches; they are of a pale *Rose* colour, and have very long foot-stalks; these are succeeded by oval pods swelling in the middle, where is lodged one or two kidney-shaped seeds.

The tenth sort grows naturally in *Siberia* and *Tartary*. This hath a shrubby stalk eight or ten feet high, sending out several branches, which grow erect, covered with a smooth yellowish bark; the leaves have each two pair of oval pointed lobes, which stand upon short foot-stalks. The flowers are produced upon single foot-stalks, which come out at the joints of the branches; they are yellow, and shaped like those of the *Laburnum*, but are smaller.

The first sort is generally propagated in the *English* nurseries, by suckers taken from the roots of the old trees, or by cutting off some of the roots, and planting them upon a gentle hot-bed; these will put out shoots, and become plants; but these are not so valuable as those which are raised from seeds, because they do not make near so great progress in their growth, and are very subject to send forth many suckers from their roots, whereby the ground will be filled with them to a great distance.

If this is propagated by seeds, they should be sown on a bed of light earth, about the latter end of *March*, or the beginning of *April*; and if the bed is well exposed to the sun, the plants will appear in about five or six weeks, and will require no farther care but to keep them clear from weeds. In this bed the plants may remain till the following spring, when they should be transplanted into a nursery about the latter end of *March*, placing them in rows at three feet distance row from row, and a foot and a half asunder in the rows. In this nursery they may remain two years, by which time they will be fit to transplant where they are designed to grow; for as these trees send forth long tough roots, so if they stand long unremoved, the roots will extend themselves to a great distance; therefore they must be cut off when the plants are transplanted, which sometimes occasions their miscarrying.

These trees will grow well upon almost every soil, but best in a light sandy ground, in which they will shoot six or eight feet in one year; and while the trees are young, they make an agreeable appearance, being well furnished with leaves, but when they are old, the branches being frequently broken by winds, render them unsightly, especially if they stand in an exposed place: also when the trees grow old, their branches decay and make a bad appearance, which occasioned their being rooted out of several gardens some years past. This is commonly known by the title of *Locust* tree in *America*; there are quantities of the seeds annually sent to *England* with that title.

The second sort is propagated in the same manner as the first, and the trees grow to the same size.

The third sort is at present scarce in the gardens about *London*, but in *Devonshire* it is in greater plenty, where the inhabitants give it the title of *Raspberry* plant, from the young shoots being covered with bristly hairs like the *Raspberry* plants; this does not produce seeds in *England*, so it is propagated by layers, and also cutting off part of the roots, and planting them upon a gentle hot-bed, where they will put out fibres, shoots, and become new plants. This sort should have a warmer situation than the two former, though the ordinary winters in this country never injure it, but in very severe winters the young shoots are sometimes killed in exposed places. It loves a light moist soil.

The fourth, fifth, sixth, seventh, eighth, and ninth sorts, are tender, so cannot be maintained in *England*, unless they are placed in a stove in winter. These are propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners bark; if the seeds are good, the plants will appear in six weeks or two months; when these are fit to transplant, they should be carefully shaken out of the pots, and their roots separated, putting each plant into a small pot, then plunged into a hot-bed of tanners

bark, and must have the same treatment as other tender plants from the same countries.

The tenth sort is propagated by seeds, which should be sown in a shady situation in autumn, then the plants will come up the following spring; but if the seeds are sown in the spring, the plants seldom rise the same season. When the plants come up, they will require no other care, but to keep them clear from weeds till autumn, when, if the plants have made any progress, they should be transplanted on a north border, at about six inches distance, where they may grow two years, and then should be planted where they are to remain, which should be in a cool moist soil.

RONDELETIA. *Plum. Nov. Gen.* 15. tab. 12.

The Characters are,

The flower has a permanent empalement sitting upon the germen, cut into five acute points. It has one funnel-shaped petal, with a cylindrical tube longer than the empalement, cut into five roundish segments at the brim, which are reflexed. It has five awl-shaped stamina, terminated by single summits; the roundish germen is situated under the flower, supporting a slender style the length of the tube, crowned by an obtuse stigma. The germen afterward becomes a roundish crowned capsule with two cells, inclosing two or three angular seeds in each.

The Species are,

1. RONDELETIA *foliis sessilibus.* *Lin. Sp. Plant.* 172. *Rondeletia* with leaves sitting close to the branches.

2. RONDELETIA *foliis petiolatis.* *Flor. Zeyl.* 80. *Rondeletia* with leaves growing upon foot-stalks.

The seeds of this plant were first sent me by Mr. *Robert Millar*, who collected them on the north side of the island of *Jamaica*; he also observed the trees growing plentifully in the *Spanish West-Indies*; I have also since received the seeds from *Barbadoes*, which have succeeded at *Chelsea*. This rises with a woody stalk eight or ten feet high, branching out on every side, covered with a smooth greenish bark, garnished with oblong leaves, ending in acute points; they are entire, and sit very close to the branches; their upper surface is of a lucid green, the under is paler; they are a little crumpled on their surface, and stand alternate. The flowers come out in bunches at the end of the branches; they are white, and have little scent.

The second sort grows naturally in *Malabar*. This rises with a woody stalk six or seven feet high, dividing into several branches, covered with a smooth bark, garnished with stiff, oblong, oval leaves, of a lucid green, standing alternate on the lower part of the branches, but by pairs toward the extremity; they have short foot-stalks, and are entire. The flowers are produced in large bunches at the end of the branches; they are of a yellowish white colour, and have a fragrant odour: these are succeeded by roundish capsules, having two cells, each containing three or four angular seeds.

These plants being very tender, cannot be preserved in *England*, unless they are kept in a warm stove. They are propagated by seeds, which should be sown on a hot-bed early in the spring; when the plants are come up and fit to remove, they must be transplanted into separate small pots, and plunged into a moderate hot-bed of tanners bark, where they must be treated in the same manner as hath been directed for other tender plants from the same country.

ROSA. *Tourn. Inst. R. H.* 636. tab. 408. The Rose-tree.

The Characters are,

The empalement of the flower is divided into five parts at the top, but the base is globular and bell-shaped. The flower hath five oval heart-shaped petals inserted in the empalement, and a great number of short hair-like stamina, inserted in the neck of the empalement, terminated by three-cornered summits. It hath many germen situated in the bottom of the empalement, each hav-

ing a short hairy style, inserted to the side of the germen, crowned by obtuse stigmas. The fleshy base of the empalement afterward becomes a top-shaped coloured fruit with one cell, including many hairy oblong seeds, fastened on each side to the empalement.

The Species are,

1. *ROSA caule aculeato, petiolis inermibus, calycibus semipinnatis.* Flor. Suec. 406. Rose with a prickly stalk, unarmed foot-stalks, and empalements which are half-winged; commonly called Wild Briar, Dog Rose, or Hep-tree.
2. *ROSA caule petiolisque aculeatis, calycis foliolis indivisis.* Flor. Suec. 407. Rose with stalks and foot-stalks armed with spines, and the small leaves of the empalement undivided; commonly called the Burnet-leaved Rose.
3. *ROSA foliis utrinque villosis, fructu spinoso.* Haller. Helv. 350. Rose whose leaves are hairy on both sides, and the fruit prickly; Apple-bearing Rose.
4. *ROSA aculeata, foliis odoratis, subtus rubiginosis.* Haller. Helvet. 350. Rose with spines and sweet-scented leaves, which are rusty on their under side; commonly called Sweet Briar.
5. *ROSA caule petiolisque aculeatis, foliis pinnatis, foliolis apice incis, fructu globoso.* Rose with the stalk and foot-stalk armed with spines, winged leaves, whose lobes are cut at their points, and a globular fruit; Scotch Rose.
6. *ROSA caule inermi, pedunculis hispida, calycis foliolis indivisis, fructibus oblongis.* Rose with a smooth stalk, a prickly foot-stalk to the flower, the small leaves of the empalement undivided, and oblong fruit.
7. *ROSA foliis utrinque villosis, calycis foliolis acutè serratis, fructu glabro.* Rose with leaves which are hairy on both sides, the small leaves of the empalement sharply sawed, and a smooth fruit.
8. *ROSA caule aculeato scandente, foliolis glabris serratis perennantibus.* Rose with a prickly climbing stalk, and smooth, sawed, ever-green leaves.
9. *ROSA caule aculeato, foliolis quinque glabris perennantibus.* Lin. Sp. Plant. 482. Rose with a prickly stalk, and five smooth lobes to the leaves, which are ever-green; ever-green Musk Rose.
10. *ROSA inermis, foliis pinnatis serratis utrinque glabris, calycis foliolis indivisis.* Rose without thorns, having winged leaves, which are smooth on both sides, and the leaves of the empalement undivided; wild Virginia Rose.
11. *ROSA caule aculeato, foliis pinnatis, foliolis ovatis serratis utrinque glabris, pedunculis brevissimis.* Rose with a prickly stalk, winged leaves, having oval sawed lobes, which are smooth on both sides, and short foot-stalks to the flower; the single yellow Rose.
12. *ROSA caule aculeato, foliis pinnatis, foliolis rotundioribus serratis, petalis emarginatis bicoloribus.* Rose with a prickly stalk, winged leaves having rounder sawed lobes, the petals of the flower indented at the top, and of two colours; the Austrian Rose.
13. *ROSA caule aculeato scandente, foliis senis glabris, floribus umbellatis.* Rose with a prickly climbing stalk, leaves having seven smooth lobes, and flowers growing in umbels; greater Musk Rose.
14. *ROSA caule aculeato, pedunculis hispida calycibus semipinnatis glabris.* Lin. Sp. Plant. 491. Rose with a prickly stalk, bristly foot-stalks, and smooth half-winged empalements; the Dutch hundred-leaved Rose.
15. *ROSA caule aculeato, pedunculis hispida, calycibus pinnatifidis hirsutis.* Rose with a prickly stalk, bristly foot-stalks to the flowers, and wing-pointed hairy empalements; Damask Rose.
16. *ROSA caule aculeato, pedunculis lævibus, calycibus semipinnatis glabris.* Lin. Sp. Plant. 492. Rose with a prickly stalk, smooth foot-stalks to the flowers, and smooth half-winged empalements; common great white Rose.

17. *ROSA caule aculeato, foliis subtus hirsutis, calycibus semipinnatis villosis.* Rose, with a prickly stalk, leaves which are hairy on their under side, and half-winged hairy empalements to the flowers; the Blush Belgick Rose.

18. *ROSA caule petiolisque aculeatis, foliis subtus villosis, calycibus semipinnatis hispida.* Rose with prickly stalks and foot-stalks, leaves hairy on their under side, and bristly half-winged empalements; commonly called Provence Rose.

19. *ROSA caule inermi pedunculis aculeatis, calycibus semipinnatis.* Rose with an unarmed stalk, prickly foot-stalks, and half-winged empalements to the flowers; the Blush Rose.

20. *ROSA caule subinermi, foliis quinque subtus villosis, calycis foliolis indivisis.* Rose with a stalk almost unarmed, leaves having five lobes, hairy on their under side, and the leaves of the empalement undivided; the red Rose.

21. *ROSA foliis pinnatis serratis subtus villosis, aculeis oppositis, calycis foliolis indivisis.* Rose with winged sawed leaves, which are hairy on their under side, spines placed opposite, and the small leaves of the empalement undivided; the Cinnamon Rose.

22. *ROSA caule petiolisque aculeatis, pedunculis calycibusque pilosissimis.* Rose with armed stalks, the foot-stalks and the empalements of the flower very hairy; commonly called Moss Provence Rose.

There are a great variety of double Roses now cultivated in the English gardens; most of them have been accidentally obtained from seeds, so that they must not be ranged as distinct species, therefore I shall only insert their common names, by which they are known in the gardens, that those, who are inclined to collect all the varieties, may be at no loss for their titles. The sorts before enumerated, I believe, are distinct species, as their specific characters are different, though it is difficult to determine which of them are really so, therefore I do not positively assert they are distinct, though I have great reason to believe they are so.

The varieties of Garden Roses which are not before mentioned:

The monthly Rose,
The striped monthly Rose,
The York and Lancaster Rose,
Mrs. Hart's Rose,

} are all supposed to be varieties of the Damask Rose.

The red Belgick Rose is supposed a variety of the Blush Belgick.

The single Velvet Rose,
The double Velvet Rose,
The Royal Velvet Rose,

} are all varieties; the last I raised from the seeds of the pale Provence Rose.

The childing Rose,
The marbled Rose,
The double Virgin Rose,

} have great affinity with each other.

The Cabbage Provence is only a variety of the common Provence.

The Blush or pale Provence is a variety of the red Provence.

The white monthly,
The white Damask,

} are varieties of the Damask Rose.

The Frankfort Rose may be a distinct species, but is of little value; the flowers rarely open fair, and have no odour.

The double sweet Briar,
The ever-green sweet Briar,
The double Blush sweet Briar,

} are varieties of the common sort.

The Austrian Rose, with red and yellow flowers, is only an accidental variety.

The double yellow Rose, is a variety of the single yellow.

The Rosa Mundi is a variety of the red Rose.

The small, white, and semidouble white, are varieties of the common white.

The first sort is very common in hedges in most parts of *England*, so is not cultivated in gardens. The hedges of this are used in medicine for making a conserve. There are two or three varieties of this Rose commonly met with in hedges, one with a white, another with a red flower, and one with smooth leaves; the two first are evidently varieties, but I doubt if the last is not a distinct species.

The second sort grows naturally in many parts of *England*. This seldom rises above three feet high. The stalks are slender, closely armed with small spines; the leaves are small, and are composed of three pair of roundish lobes, terminated by an odd one; the flowers are white, and have an agreeable musky scent. This propagates fast by its creeping roots.

The third sort grows naturally in the northern counties in *England*; this rises with strong stalks to the height of seven or eight feet. The young branches are covered with a smooth brown bark; the spines are but few, and are very strong; the leaves are large, and hairy on both sides; they are composed of three pair of oblong oval lobes, terminated by an odd one; these are deeply sawed on the edges; the flowers are large, single, and of a red colour, and are succeeded by large roundish hedges or fruit, which are set with soft prickles; these have a pleasant acid pulp surrounding the seeds, therefore are by some persons preferred, and made into a sweetmeat, which is served up in desserts to the table.

The fourth sort is the common Sweet-Briar, which is so well known as to need no description. This is found growing naturally in some parts of *Kent*.

The fifth sort is the Dwarf *Scotch* Rose, of which there are two varieties, one with a variegated flower, and the other of a livid red colour. This sort seldom rises more than a foot high. The stalks are covered with a brown bark, and are closely armed with small spines; the leaves are very small, resembling those of Burnet; the flowers are small, and sit close to the branches; the fruit is round, and of a deep purple colour, inclining to black when ripe.

The sixth sort rises to the height of six or seven feet. The stalks and branches have no spines, but are covered with a smooth reddish bark; the leaves are composed of three pair of thin oval lobes, terminated by an odd one, of a bright green, and very slightly sawed on their edges, standing pretty far asunder upon the midrib; the foot-stalks of the flowers are armed with bristly hairs; the five leaves of the empalement are long, slender in the middle, but terminate in an oval leafy point; the flowers are single, of a bright red colour; these are succeeded by long spear-shaped hedges, which are smooth. The plants produce a second crop of flowers about the end of *August*, but these fall off, and are not succeeded by hedges.

The seeds of the seventh sort were sent me by *Robert More, Esq;* from *Spain*, where he found the plants growing naturally; this rises with strong upright stalks about three feet high, armed with strong thorns. The leaves are hairy on both sides; the lobes are roundish, sawed on their edges; the small leaves of the empalement are acutely sawed; the flowers are single, of a bright red colour; these are followed by large, smooth, roundish hedges, which ripen the end of *August*.

The eighth sort was discovered by Signior *Micheli*, growing naturally in the woods near *Flrence*, who sent it to Dr. *Boerhaave* of *Leyden*, in whose curious gardens I saw it growing in the year 1727. This hath slender stalks, which trail upon the ground, unless they are supported, and, if trained up to a pole or the stem of a tree, will rise twelve or fourteen feet high; they are armed with crooked reddish spines, garnished with small leaves, composed of three pair of oval acute-pointed lobes, terminated by an odd one, of

a lucid green, and are sawed on their edges; they continue green all the year; the flowers are small, single, white, and have a musky odour; these in their natural place of growth continue in succession great part of the year, but their time of flowering in *England* is in *June*.

The ninth sort grows naturally in *Spain*; the seeds of this were sent me by *Robert More, Esq;* who found the plants growing there naturally. This rises with erect stalks five or six feet high, covered with a green bark, and armed with strong, crooked, white spines. The leaves are composed of five oval lobes, ending in acute points; they are smooth, of a lucid green, and are slightly sawed on their edges; these continue all the year, and make a goodly appearance in winter. The flowers grow in large bunches or umbels at the end of the branches; they are single, white, and have a strong musky odour; they appear in *August*, and, if the autumn proves favourable, will continue in succession till *October*.

The tenth sort grows naturally in *Virginia* and other parts of *North America*; this rises with several smooth stalks to the height of five or six feet. The young branches are covered with a smooth purple bark; the leaves are composed of four or five pair of spear-shaped lobes, terminated by an odd one, of a lucid green on their upper side, but pale on their under, and are deeply sawed on their edges; the flowers are single, of a livid red colour; the empalement is divided into five long narrow segments, which are entire. This is kept in gardens for the sake of variety, but the flowers have little scent.

The eleventh sort is the single yellow Rose; this hath weak stalks, which send out many slender branches, closely armed with short, crooked, brown spines. The leaves are composed of two or three pair of oval thin lobes, terminated by an odd one, of a light green, sharply sawed on their edges; the flowers grow upon short foot-stalks; they are single, of a bright yellow colour, but have no scent.

The twelfth sort is commonly called the *Austrian* Rose. The stalks, branches, and leaves, are like those of the last, but the leaves are rounder; the flowers are larger; the petals have deep indentures at their points; they are of a bright yellow within, and of a purplish copper colour on the outside; they are single, have no scent, and soon fall away. There is frequently a variety of this with yellow flowers upon one branch, and copper colour upon another. This sort of Rose loves an open free air and a northern aspect.

The thirteenth sort is the Musk Rose; this rises with weak stalks to the height of ten or twelve feet, covered with a smooth greenish bark, armed with short strong spines. The leaves are smooth, composed of three pair of oval spear-shaped lobes, terminating in points, ending with an odd one; they are of a light green colour, sawed on their edges; the flowers are produced in large bunches in form of umbels at the end of the branches; they are white, and have a fine musky odour. There is one with single, and another with double flowers of this sort. The stalks of these plants are too weak to support themselves, so the plants should be placed where they may have support.

The fourteenth sort is the *Dutch* hundred-leaved Rose; this rises with prickly stalks about three feet high. The leaves have sometimes three, and at others five lobes; the lobes are large, oval, smooth, of a dark green, with purple edges; the foot-stalk of the flower is set with brown bristly hairs; the empalement of the flower is smooth, half-winged; the flowers are very double, and of a deep red colour, but have little scent.

The fifteenth is the *Damask* Rose; this rises with prickly stalks eight or ten feet high, covered with a greenish bark, armed with short spines. The leaves are composed of two pair

pair of oval lobes, terminated by an odd one; they are of a dark green on their upper side, but pale on their under; the borders frequently turn brown, and are slightly sawed; the foot-stalks of the flowers are set with prickly hairs; the empalement of the flower is wing-pointed and hairy; the flowers are of a soft pale red, and not very double, but have an agreeable odour; the hips are long and smooth.

The sixteenth is the common large white Rose, so well known as to need no description. Of this there are two varieties, one with a half double flower, having but two or three rows of petals, and the other has a smaller flower, and the shrub is of lower growth.

The seventeenth sort is called the Blush *Belgick* Rose; this rises about three feet high, with prickly stalks. The leaves are composed either of five or seven lobes, which are oval, hairy on their under side, slightly sawed on their edges; the foot-stalks of the flowers and the empalements are hairy, and without spines; the empalements are large and half-winged; the flowers are very double, of a pale flesh colour, and have but little scent. It generally produces great quantities of flowers. The red *Belgick* Rose differs from this only in the colour of the flower, which is of a deep red.

The eighteenth sort is the common *Provence* Rose, which is well known in the *English* gardens, being cultivated in great plenty in the nurseries, and is one of the most beautiful sorts yet known. The flowers of this sort are sometimes very large, and the petals are closely folded over each other like Cabbages, from whence it is called the Cabbage Rose. The flowers of this sort of Rose have the most fragrant odour of all the sorts, therefore is better worth propagating.

The nineteenth sort is the Blush Rose. The stalks of this rise from three to four feet high; and are not armed with spines; the leaves are hairy on their under side; the foot-stalks of the flowers are armed with some small spines; the empalement of the flower is half-winged; the flowers have five or six rows of petals, which are large, and spread open; they are of a pale blush colour, and have a musky scent.

The twentieth sort is the common red Rose, whose flowers are used in medicine. The stalks of this grow erect, and have scarce any spines; they rise from three to four feet high; the leaves are composed of three or five large oval lobes, which are hairy on their under side; the small leaves of the empalement are undivided; the flowers are large, but not very double, spread open wide, and decay soon; they are of a deep red colour, and have an agreeable scent. The *Rosa Mundi* is a variety of this with striped flowers.

The twenty-first sort is the double Cinnamon Rose; this is one of the smallest flowers, and the earliest of all the kinds. The stalks rise about four feet high, covered with a purplish smooth bark, and have no spines but at the joints immediately under the leaves, where they are placed by pairs; they are short and crooked. The leaves are composed of three pair of oval lobes, terminated by an odd one; they are hairy on their under side, and are sawed on their edges; the leaves of the empalement of the flower are narrow and entire; the flower is small, double, and has a scent like Cinnamon, from whence it has the title of Cinnamon Rose.

The twenty second sort is called the Moss *Provence* Rose, from the resemblance which the flowers of this have to those of the common *Provence* Rose, yet it is undoubtedly a distinct species, for although the stalks and shoots of this are very like those of the common, yet the plants are difficult to propagate, which the common sort is not. This very rarely sends up suckers from the root, and when the branches are laid down, they are long before they put out roots, so that this sort has been frequently propagated

by budding it upon stocks of other sorts of Roses, but the plants so raised are not so durable as those which are propagated by layers.

The stalks and branches of this sort are closely armed with brown spines; the foot-stalks of the flowers and the empalements, are covered with long hair-like moss; the flowers are of an elegant crimson colour, and have a most agreeable odour.

Most of the sorts of Roses are of foreign growth, and have been at various times introduced into the *English* gardens, but they are generally natives of northern countries, or grow upon the cold mountains in the warmer parts of *Europe*, so they are very hardy in respect to cold, but love an open free air, especially the yellow Rose, the *Austrian* Rose, and the monthly Rose. The two former will not flower in a warm soil and situation, nor near the smoke of *London*; and the monthly Rose will not flower much better, unless it is planted in a free open air, for it seldom flowers in the smoke of *London*.

The usual time of these shrubs producing their flowers, is from the middle or latter end of *May* till the middle or end of *July*.

But in order to continue these beauties longer than they are naturally disposed to last, it is proper to plant some of the monthly Roses near a warm wall, which will occasion their budding at least three weeks or a month before those in the open air, and, if you give them the help of a glass before them, it will bring their flowers much forwarder, especially where dung is placed to the backside of the wall (as is practised in raising early fruits); by this method I have seen fair Roses of this kind blown in *February*, and they may be brought much sooner against hot walls, where people are curious this way.

You should also cut off the tops of such shoots which have been produced the same spring, early in *May*, from some of these sorts of Roses which are planted in the open air, and upon a strong soil; this will cause them to make new shoots, which will flower late in autumn, as will also the late removing the plants in spring, provided they do not suffer by drought.

The next sort of Rose which flowers in the open air, is the Cinnamon, which is immediately followed by the *Damask* Rose, then the Blush, *York*, and *Lancaster* come, after which the *Provence*, *Dutch* hundred-leaved, white, and most other sorts of Roses follow, and the latest sorts are the Moss Roses, which, if planted in a shady situation, seldom flower until *September*, and, if the autumn proves mild, will continue often till the middle of *October*.

The plants of these two sorts should be placed against a wall, pale, or other building, that their branches may be supported, otherwise they are so slender and weak, as to trail upon the ground. These plants should not be pruned until spring, because their branches are somewhat tender, so that when they are cut in winter, they often die after the knife; these produce their flowers at the extremity of the same year's shoots in large bunches, so that their branches must not be shortened in the summer, lest thereby the flowers should be cut off. These shrubs will grow to be ten or twelve feet high, and must not be checked in their growth, if you intend they should flower well, so that they should be placed where they may be allowed room.

The lowest shrub of all the sorts here mentioned is the *Scotch* Rose, which rarely grows above one foot high, so that this must be placed among other shrubs of the same growth. The red Rose and the *Rosa Mundi*, commonly grow from three to four feet high, but seldom exceed that, but the *Damask*, *Provence*, and *Frankfort* Roses; grow to the height of seven or eight feet; so that in planting them, great care should be taken to place their several kinds, according

to their various growth, amongst other shrubs, that they may appear beautiful to the eye.

The yellow Rose, as also the *Austrian* Rose, are both natives of *America*. These were originally brought from *Canada* by the *French*; the other varieties, which are now in the gardens, have been accidentally obtained from seeds, and are preserved by budding them on the other sorts. The shrubs of these Roses seldom shoot so strong as most of the other sorts, especially in the light land near *London*, where they rarely produce their flowers. These are esteemed for their colour, being very different from all the other sorts of Roses, but, as their flowers have no scent, and are of short duration, they do not merit the price they are generally sold at.

The *Frankfort* Rose is of little value, except for a stock to bud the more tender sorts of Roses upon, for the flowers seldom open fair, and have no scent; but, it being a vigorous shooter, renders it proper for stocks to bud the yellow and *Austrian* Roses, which will render them stronger than upon their own stocks, but the yellow Roses seldom blow fair within eight or ten miles of *London*, though in the northern parts of *Great-Britain* they flower extremely well. This sort must have a northern exposure, for, if it is planted too warm, it will not flower.

The *Damask* and monthly Rose seldom flower well in small confined gardens, nor in the smoke of *London*, therefore are not proper to plant in such places, though they frequently grow very vigorously there. These always begin to shoot the first of any of the sorts in the spring, therefore frequently suffer from frosts in *April*, which often destroys all their flowers.

All the sorts of Roses may be propagated either from suckers, layers, or by budding them upon stocks of other sorts of Roses, which latter method is only practised for some peculiar sorts, which do not grow very vigorous upon their own stocks, and send forth suckers very sparingly, or where a person is willing to have more sorts than one upon the same plant; but, where this is designed, it must be observed to bud only such sorts upon the same stock as are nearly equal in their manner of growth, for if there be a bud of a vigorous-growing sort, and others of weak growth, budded in the same stock, the strong one will draw all the nourishment from the weaker, and entirely starve them.

If these plants are propagated by suckers, they should be taken off annually in *October*, and transplanted out either into a nursery in rows (as hath been directed for several other sorts of flowering shrubs), or into the places where they are to remain; for if they are permitted to stand upon the roots of the old plants more than one year, they grow woody, and do not form so good roots as if planted out the first year, so there is more danger of their not succeeding.

But the best method to obtain good-rooted plants, is to lay down the young branches in autumn, which will take good root by the autumn following, when they may be taken from the old plants, and transplanted where they are to remain. The plants which are propagated by layers, are not so apt to send out suckers from their roots as those which are from suckers, therefore should be preferred before them, because they may be much easier kept within compass, and these will also flower much stronger. The plants may be transplanted any time from *October* to *April*, but, when they are designed to flower strong the first year after planting, they should be planted early, though, as I said before, if they are planted late in the spring, it will cause them to flower in autumn, provided they do not suffer by drought.

Most of these sorts delight in a rich moist soil and an open situation, in which they will produce a greater quantity of flowers, and those much fairer, than when they are

upon a dry soil, or in a shady situation. The pruning, which they require, is only to cut out their dead wood, and take off all the suckers, which should be done every autumn; and, if there are any very luxuriant branches, which draw the nourishment from the other parts of the plant, they should be taken out, or shortened, to cause them to produce more branches, if there be occasion for them to supply a vacancy; but you must avoid crowding them with branches, which is as injurious to these plants as to fruit-trees, for, if the branches have not equal benefit of the sun and air, they will not produce their flowers so strong, nor in so great plenty, as when they are more open, so that the air may circulate more freely between them.

ROSA SINENSIS. See *Hibiscus*.

ROSA THE GUILDER. See *Opulus*.

ROSMARINUS. *Tourn. Inst. R. H.* 195. tab. 92. *Rosemary*.

The Characters are,

The flower has a tubulous empalement, compressed at the top, the mouth erect, and divided into two lips; the upper lip is entire, and the under bifid. It hath one petal, whose tube is longer than the empalement; the brim is ringent; the upper lip is short, erect, and divided into two parts, whose borders are reflexed; the lower lip is reflexed, and cut into three parts. It hath two awl-shaped stamina, inclining toward the upper lip, terminated by single summits, and a four-pointed germen, with a style the shape, length, and in the same situation with the stamina, crowned by an acute stigma. The germen afterward becomes four oval seeds sitting in the bottom of the empalement.

The Species are,

1. ROSMARINUS foliis linearibus marginibus reflexis, subtus incanis. *Rosemary* with linear leaves, which are reflexed on their edges, and hoary on their under side; *Garden Rosemary* with a narrower leaf.

2. ROSMARINUS foliis linearibus obtusis, utrinque virentibus. *Rosemary* with obtuse linear leaves, which are green on both sides; or broad leaved wild *Rosemary*.

These two sorts have been frequently supposed the same, and their difference accidental, but I have long cultivated both, and have raised them from seeds without finding them vary, so I believe they are distinct species. The leaves of the second sort are broader than those of the first, and their points are obtuse; the flowers are also much larger, and of a deeper colour; the stalks grow larger, and spread out their branches wider; the whole plant has a stronger scent. These differences the gardeners, who cultivate the plants for the market, observe.

There are two other varieties of these plants, one of the first sort with striped leaves, which the gardeners call the *Silver Rosemary*; the other is of the second sort, which is striped with yellow; this the gardeners call the *Gold striped Rosemary*. The plants of this sort are pretty hardy, so will live in the open air through our common winters, if they are upon a dry soil.

These plants grow plentifully in the southern parts of *France*, in *Spain*, and in *Italy*, where, upon dry rocky soils near the sea, they thrive prodigiously, and perfume the air so as to be smelt at a great distance from the land; but, notwithstanding they are produced in warm countries, yet they are hardy enough to bear the cold of our ordinary winters very well in the open air, provided they are planted upon a poor, dry, gravelly soil, on which they will endure the cold much better than upon richer ground, where the plants will grow more vigorously in summer, and so be more subject to injury from frost, nor will they have so strong an aromack scent as those upon a dry barren soil.

Those sorts with striped leaves are somewhat tender, especially that with silver stripes, so should either be planted near a warm wall, or in pots, to be sheltered in winter under a frame, otherwise they will be subject to die in frosty weather.

These



RUBIA foliifera Hort. Cliff. 35.

J. Miller delin. et. sculp.

These sorts may be propagated by planting slips or cuttings in the spring of the year, just before the plants begin to shoot, upon a bed of light fresh earth, and, when they are rooted, they may be transplanted into the places where they are designed to grow; the best time is about the beginning of *September*, that they may take new root before the frosty weather comes on; for, if they are planted too late in autumn, they seldom live through the winter, especially if the weather proves very cold, so that if you do not transplant them early, it will be the better method to let them remain unremoved until *March* following, when the frost is over, observing never to transplant them at a season when the dry east winds blow, but rather defer the doing of it until the season is more favourable; for, if they are planted when there are cold drying winds, their leaves are apt to dry up, which often kills them; but, if there happen to be some warm showers soon after they are removed, it will cause them to take root immediately, so that they will require no farther care, but to keep them clear from weeds.

Although these plants are tender when planted in a garden, yet, when they are by accident rooted in a wall (as I have several times seen them), they will endure the greatest cold of our winters, though exposed much to the cold winds, which is occasioned by the plants being more stunted and strong, and their roots being drier.

The flowers of the narrow-leaved garden sort are used in medicine, as are also the leaves and seeds.

ROYENA: *Lin. Gen. Plant.* 491.

The Characters are,

The flower has a bellied permanent empalement, whose mouth is obtuse and five-pointed. It has one petal, having a tube the length of the empalement, but the brim is divided into five parts, which turn back. It hath ten short stamina growing to the petal, terminated by oblong, erect, twin summits, and an oval hairy germen sitting upon two styles a little longer than the stamina, crowned by single summits. The empalement afterward turns to an oval capsule with four furrows, having one cell with four valves, containing four oblong triangular seeds.

The Species are,

1. ROYENA foliis ovatis scabriusculis. *Hort. Cliff.* 149. Royena with oval rough leaves.

2. ROYENA foliis lanceolatis glabris. *Prod. Leyd.* 441. Royena with smooth spear shaped leaves.

3. ROYENA foliis lanceolatis hirsutis. *Prod. Leyd.* 441. Royena with hairy spear-shaped leaves.

The first sort has been long an inhabitant of some curious gardens in *England*, but it is not very common here, for it is very difficult to propagate.

This plant grows eight or ten feet high, and puts out its branches on every side, so may be trained up to a regular head: the branches are clothed with oval shining leaves, which are placed alternately, and continue all the year, so make an agreeable variety among other exotick plants in the green-house, during the winter season. The flowers are produced from the wings of the leaves along the branches, but as they have little beauty, few persons regard them. I have not observed any fruit produced by these plants in *England*.

The second sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk five or six feet high, sending out many slender branches, covered with a purplish bark, and garnished with small oval leaves, less than those of the Box-tree; they are smooth, entire, and of a lucid green, continuing all the year. The flowers come out from the wings of the leaves round the branches; they are white, and shaped like a pitcher; these are succeeded by roundish purple fruit, which ripen in the winter.

The third sort grows naturally at the *Cape of Good Hope*.

This rises with a strong woody stalk seven or eight feet high, covered with a gray bark, sending out many small branches alternately, which are garnished with spear-shaped hoary leaves, covered with soft hairs. The flowers come out upon short foot-stalks from the side of the branches; they are of a worn-out purple colour, and small.

These plants are too tender to live through the winter in the open air in *England*, therefore they must be removed into the green-house in autumn, and treated in the same way as Orange-trees, with which culture the plants will thrive.

The first and third sorts are difficult to propagate here, for the branches which are laid down seldom put out roots, and those which do, are two years before they will have made roots sufficient to transplant, and their cuttings very rarely succeed; these are the only methods by which they can be increased in those countries, where they do not produce seeds. The best time to plant the cuttings is in *September*; these should be planted in small pots, and plunged into a very moderate hot-bed. The pots should be closely covered down with hand-glasses to exclude the external air, and the cuttings refreshed with a little water every eighth or tenth day, according as the earth becomes dry, for much moisture will kill them. If the cuttings shoot, they must be gradually inured to bear the open air, and when they are well rooted, they should be each planted in a separate small pot, and afterward treated as the old plants.

If the plants put out any young shoots from the bottom, they should be carefully laid down in the ground while young, because when the shoots are tender, they are more apt to put out roots than after they are become woody and hard; these branches should be slit in the same manner as is practised in laying of Carnations: they must be frequently, but gently watered during the warm weather in summer, but in cold weather it must be sparingly given them; when these are rooted, they may be taken off, and treated in the same way as the cuttings.

The second sort is very apt to send up suckers from the roots, which may be taken off with the roots, and thereby increased; or those which do not put out roots, may be laid down in the same manner as the former; and the cuttings of this more frequently succeed than those of the other, so that this sort is much easier propagated.

RUBIA. *Tourn. Inst. R. H.* 113. tab. 38. Madder.

The Characters are,

The empalement of the flower is small, cut into four segments, and sits upon the germen. The flower has one bell-shaped petal, having no tube, but is divided into four parts. It hath four awl-shaped stamina, which are shorter than the petals, terminated by single summits, and a twin germen under the flower, supporting a slender style, divided into two parts upward, and crowned by two headed stigmas. The germen afterward becomes two smooth berries joined together, each having one roundish seed with a navel.

The Species are,

1. RUBIA foliis senis lanceolatis supernè glabris. Madder with six spear-shaped leaves in whorls, whose upper surfaces are smooth; dyer's Madder.

2. RUBIA foliis inferioribus senis, supernè quaternis binifve, utrinque asperis. Madder with the lower leaves, growing by sixes round the stalks, and the upper ones by fours or pairs, which are rough on both sides; rough wild Madder.

3. RUBIA foliis quaternis. *Prod. Leyd.* 254. Madder with four leaves, which are placed round the stalks.

The first sort, which is cultivated for the root that is used in dyeing and staining of linens, grows naturally in the *Levant*. This hath a perennial root, and an annual stalk; the root is composed of many long, thick, succulent fibres, almost as large as a man's little finger; these are joined at the top in a head, like the roots of Asparagus, and run very

very deep into the ground; I have taken up roots, whose strong fibres have been more than three feet long; from the upper part (or head of the root) come out many side roots, which extend just under the surface of the ground to a great distance, whereby it propagates very fast; for these send up a great number of shoots, which, if carefully taken off in the spring, soon after they are above ground, become so many plants. These roots are of a reddish colour, somewhat transparent, and have a yellowish pith in the middle, which is tough, and of a bitterish taste; from the root arise many large four-cornered jointed stalks, which in good land will grow five or six feet long, and, if supported, sometimes seven or eight; they are armed with short herbaceous prickles, and at each joint are placed five or six spear-shaped leaves; their upper surfaces are smooth, but their midrib on the under side is armed with rough herbaceous spines; the leaves sit close to the branches in whorls. From the joints of the stalk come out the branches, which sustain the flowers; they are placed by pairs opposite, each pair crossing the other; these have a few small leaves toward the bottom, which are by threes, and upward by pairs opposite; the branches are terminated by loose branching spikes of yellow flowers, which are cut into four parts, resembling stars. These appear in *June*, and are sometimes succeeded by seeds, which never ripen in *England*.

The second sort grows naturally in *Spain*. This hath perennial roots like those of the first sort, but are much larger; the stalks of this are smaller than those of the first sort, and are almost smooth; their lower parts are garnished with narrow leaves, placed by sevens in whorls round the stalks, but upward they diminish to four, three, and two toward the top; these are rough on both sides; at each joint of the stalk come out two short foot stalks opposite, having two small rough leaves, ending with branching foot-stalks, sustaining small yellow flowers.

The third sort grows naturally in *Spain* and the *Balearic Islands*; I received the seeds of this sort from *Gibraltar*, and also from *Minorca*, where the plants grew out of the crevices of the rocks. The roots of this sort are much smaller than those of the two former, but are less succulent; they strike deep into the ground, and send up several slender four-cornered stalks, which are perennial; these grow a foot and a half long, and divide into many branches, whose joints are very near each other; they are garnished with short, stiff, rough leaves, placed by fours round the stalk, of a lucid green, and continue all the year.

There is a sort which grows naturally in *Wales*, and also upon *St. Vincent's Rock*, which has four leaves at each joint, but these are narrower and longer than those of the third sort; the stalks of this are perennial, and the leaves evergreen, so that *Mr. Ray* has mistaken this plant, having supposed it to be the second, which hath annual stalks rising much higher, therefore I should rather think it might be the third sort, if they were equally hardy; but the third sort is so tender, as to be always killed by severe frosts in *England*.

The first sort is that which is cultivated for the use of the dyers and callico printers, and is so essential to both manufactories, as that neither of those businesses can be carried on without this commodity; and the consumption of it is so great here, as that upon a moderate computation, there is annually so much of it imported from *Holland*, as the price of it amounts to more than one hundred and eighty thousand pounds sterling, which might be saved to the publick, if a sufficient quantity of it were planted in *England*, where it might be cultivated to greater advantage than in *Holland*, the lands here being better adapted to grow this plant. But as the growing of this plant in quantity, has been for several years discontinued, so the method of cul-

ture is not well known to many persons here; and as there is at present an inclination in the publick to regain this lost branch of trade (for formerly there was not only enough of this commodity raised in *England* for our own consumption, but also great quantities of it were sent abroad), so we shall here give a full account of the culture of the plant, and also of the method of preparing the root for use; and shall begin with the method now practised in *Zealand*, where the best and greatest quantity of Madder is now raised.

In all the *Netherlands*, there is no where better Madder cultivated than in *Schowen*, one of the islands of *Zealand*, which is performed in the following manner:

The land which is designed for Madder, if it is strong and heavy, is ploughed twice in autumn, that the frost in winter may mellow it and break the clods; then it is ploughed again in the spring, just before the time of planting the Madder, but if the ground is light, then it is ploughed twice in the spring; at the last ploughing it is divided into lands of three feet broad, with furrows between each land, four or five inches deep. Madder requires a loamy substantial soil, not too stiff and heavy, nor over light and sandy; for although it may thrive tolerably well in the latter, yet such land cannot have a second crop of Madder planted upon it in less than eight or ten years interval; but in *Schowen*, where the land is substantial, they need not stay longer than three or four years, in which interval the ground is sown with Corn, or planted with any kinds of pulse. It is granted, that the best land for producing of Madder is in *Schowen*, where a gemet of land, which is three hundred square rods of twelve feet each, will yield from one thousand pounds to three thousand pounds weight, according to the goodness of the land and the favourableness of the seasons; but in light land, the quantity is from five hundred to a thousand pounds weight.

The time for planting of Madder begins toward the end of *April*, and continues all *May*, and sometimes in very backward springs, there is some Madder planted the beginning of *June*. The young shoots from the sides of the root are taken off from the mother plant, with as much root as possible; these are called *Kiemen*, and are planted with an iron dibble in rows at one foot asunder, and commonly four *Kiemen* in a row.

The quantity of these slips (or *Kiemen*) as is required to plant one gemet of land, are sold at different prices, according to the price which Madder bears, or to the demand for the plants; they are often sold from sixteen to twenty guilders, and sometimes they have been sold for ten or eleven pounds *Flemish*, but the lowest price is from fifteen guilders to three pounds *Flemish*.

The expence of planting out a gemet of land with slips (or *Kiemen*) costs for labour only, from sixteen to twenty guilders, according as the land is heavy or light: there are generally employed six men to plant, two to rake the ground; these earn each a guilder a day; and five or six women or boys, called *carpers* or *pluckers* of the shoots or *Kiemen*, these earn twelve *Dutch* pence a day, or two *schillings*.

The first year the Madder is planted, it is customary to plant Cabbages or dwarf *Kidney-beans*, in the furrows between the beds, but there is always great care taken to keep the ground clean from weeds; this is generally contracted for at two pounds *Flemish* at each gemet of land.

In *September* or *October*, when the young Madder is cleaned for the last time that season, the green Haulm (or stalks) of the plants, is carefully spread down over the beds, without cutting any part off, and in *November* the Haulm of the Madder is covered over with three or four inches of earth.

This covering of the Madder is performed either with the plough or with the spade; if it is done by the first, it costs

costs two guilders and a half, or three guilders in strong land each gemet, and over and above this, one guilder and a half to level the tops of the beds, and make them smooth; but it is better performed with the spade, only it is more chargeable, for that costs from eight to ten guilders each gemet, but at the same time the clods are better broken, and the surface of the beds made smooth and even.

The second year in the beginning of *April*, which is about the time the Kiemen or young shoots are beginning to come out, the earth on the top of the beds should be scuffled over and raked, to destroy the young weeds, and make the surface smooth and mellow, that the Kiemen may shoot out the easier above ground; this labour costs three shillings each gemet.

The second summer there must be the same care taken to keep the Madder clean as in the first, and then nothing is planted in the furrows, or suffered to grow there; at the last time of cleaning the ground, in *September* or *October*, the green Haulm is again spread down upon the beds; and in *November*, the Madder is again covered with earth in the same manner as the first year.

By this method of culture, one can see how necessary it is to plant the Madder in beds, for thereby it is much easier covered with the earth of the furrows; and hereby the earth of the beds is every time heightened, whereby the Madder roots will be greatly lengthened, and the Kiemen or young shoots will have longer necks, and by being thus deeply earthed, will put out more fibres and have much better roots, without which they will not grow; and it is of equal use to the mother plants, for by this method the roots will be longer; and in this consists the goodness and beauty of the Madder, for those which have but few main roots, are not so much esteemed as those which are well furnished with side roots, called *Tengels*; a Madder plant that has many of these roots, is called a well-bearded Madder plant; therefore one must never cut off the side roots, for by so doing there will be a less crop of Madder, and but few Kiemen or young shoots can be produced; besides, by the loss of moisture, sometimes the plants will droop and become weak; and there is great profit in having a large quantity of Kiemen to draw in the spring, which are in plenty the second and third years.

The Madder roots are seldom dug up the second year, but generally after it has grown three summers, therefore the culture of the third year is the same as in the second, during the spring and summer.

Before the first day of *September*, it is forbidden to dig up any Madder in this island; but on that day early in the morning, a beginning is made, and the person who carries the first cart load to the stove, has a premium of a golden rider, or three ducats.

The digging up the Madder of a gemet of land, costs from thirty-six to one hundred guilders, according to the goodness of the crop, and the lightness or stiffness of the ground, but in light land it costs from nine to ten pounds *Flemish*; the persons who are adroit in this business, are generally paid five shillings *Flemish* per day.

The Madder produces flowers in the middle of summer, and sometimes a few seeds, but they never ripen here; nor would they be of use to cultivate the plants, since it is so easily done by the Kiemen.

Some years past they began to plant here the great wild Madder, which was called *French Madder*, but this was not esteemed so good for use as the tame Madder, from which it differs much, so that was not continued. The more bitter of taste the roots of the Madder are, when taken out of the ground before it is brought to the stove, the less it will lose of its weight in drying, and is the better afterward for use.

When the Madder is dug out of the ground, it is carried to the stove, and there laid in heaps; in that which is called the cold stove, and separated with hurdles made of wicker, and memorandums kept of each parcel, and to what countryman it belongs, that each may be dried in their turns, and prepared or manufactured, for which turn generally lots are cast beforehand. The Madder thus carried to the stove is *Relzyn*.

This *Relzyn* is carried about six o'clock in the morning, into the tower or steeple, hoisted in baskets by ropes to the rooms, and divided or spread where it remains till the next day, two or three o'clock in the morning, about twenty or twenty-one hours; then those roots which have lain in the hottest places are removed to cooler, and those in the cooler are removed to the hotter places nearer the oven. This is continued for four or five days, according as there has been more or less carried there; but it is always the goods of one person, that every one may have his own, and of as equal quality as possible, when it is delivered out.

When the Madder is sufficiently dried in the tower, then it is threshed on the threshing floor, which is made clean from dirt or filth, and then it is brought to the kiln, and there spread on a hair-cloth for about twenty hours, during which time the kiln is made more or less hot, according as the roots are more or less thick, or the weather more or less cold.

From the kiln the Madder is moved to the pounding-house, and is there pounded on an oaken block made hollow, with six stampers platted at the bottom with iron bands; these stamps are kept in motion by a mill very much resembling a grist-mill, which is turned by three horses; the presence of the pounding-master is here always required, to stir the Madder continually with a shovel, to bring it under the stampers. When the Madder is thus properly pounded, it is sifted over a tub till there is enough to fill a cask: this first pounding, which chiefly consists of the thinnest and smallest roots, and the outside husks with some earth, which by drying and threshing could not be separated, is called *Mor Mull*.

What remains in the sieve is put on the block again, and pounded a second time; and when the pounding-master guesses a third part is pounded, then the Madder is taken out again, and sifted over another tub, and put into a separate cask, and this is called *Gor gemeens*; that which remains in this second operation, not enough pounded in the sieve, is for the third time put on the block, and pounded till it is all reduced to powder, which is called *Kor krap*s.

When the Madder is cleansed from the dirt and *Mull*, and is entirely pounded at once, then it is called *Oor Onberooftde*, so that this *Onberooftde* actually consists of the *Gemeens* and *Krap*s pounded together, and sifted without separating them from each other.

When there is two-thirds of *Krap*s, and one-third *Gemeens*, which was separately prepared or manufactured, then they are called two and one, or marked $\frac{2}{1}$.

The sweepings of the stove, as also of the ground and beams being swept together is not lost, but is put amongst the *Mull*, or sold by itself.

The sweepings of the mill, and every part of the pounding place, is also gathered together, and put into a cask; this is called *Den Beer*.

When the Madder is thus prepared and put into casks, it is in *Zealand* examined by sworn assayers and tried, if it is not faulty packed up; that is, whether in the preparing it is properly manufactured, or falsely packed up, and to see if every part of the cask is filled with Madder of equal goodness and quality, not burned in the drying, or mixed with dirt; which the assayers, by certain trials, and by weighing and washing of the Madder,

der, can know, if it is according to the statutes of the country.

There are sundry statutes made and published by the states of *Zealand*, concerning the preparing of Madder; as one of the 28th of *July*, 1662, one on the 29th of *September*, and 31st of *October*, 1671, another on the 23d of *September*, 1699, and the last on the 28th of *April*, 1735: by which statutes, among other things, it is strictly forbidden, That no person shall prepare Kraps, in which there shall be more than two pounds of dirt in a hundred weight, nor above eight pounds in the like weight of *Onberooftde*, or in *Gemeens* more than twelve pounds in a hundred weight.

If the Madder upon trial is found good, the arms of the city or village, and the sign of the stove where the Madder was prepared, is painted on the cask with black paint. The trial of the Madder is in no place more exact, or more religiously observed, than in the city of *Zirkzee*, therefore the merchants in *Germany*, who know this, always prefer the Madder of that place to all others, and will not buy any which has not the arms of *Zirkzee* painted upon the casks, if they are to be had.

We before mentioned the tower, the kiln, &c. where the Madder is dried and prepared for use, the draughts of these are exhibited in the annexed plans, with their explanation; but that a better judgment may be formed of their use, we shall here take notice, that the tower is the place where the Madder is first dried. This tower is heated by fifteen or sixteen pipes or flues of brick-work, which run on each side the tower under the floor, and are covered with low burnt tiles, some of which are loose; so that by taking up these, the heat is moderated, and conducted to any part of the tower, the person who has the care of drying the Madder pleases.

This tower has four or five lofts made of strong laths; they are four or five feet above each other, upon which the Madder is laid; these are heated by an oven, which is placed in the room where the work people live, and is by them called the *Glory*.

The kiln is in a room, whose length is equal to the breadth of the stove, and is entirely arched over at the top; the oven, by which the kiln is heated, is called the *Hog*; this is built upon a stone wall, which rises a foot or two above ground; and the small arch, by which the heat passes through every part, has several square little holes in the brick work, that the heat may come out; over these holes, on the top of the kiln, are laid wooden laths the whole length, and upon them a hair-cloth, on which the Madder is laid to dry, before it is carried to the pounding place. In the Madder-stoves there is no other fuel used but *Friezland* turf, which gives an equal and moderate heat.

In the Madder-stoves, the people work more by night than day; first, because at the time of year when the Madder is brought into the stoves, the nights are much colder than the days; and secondly, that the matter, who must be always attentive to his work, may not be interrupted by visitors; and thirdly, because they see less dust; but principally, because the Madder, which is pounded in the night, is of a much better colour than that which is pounded in the day.

In the Madder-stoves are always constant workmen, one who is the dryer, who has the care of drying the Madder in the tower and the kiln; for the right performance of this, art and experience are required, the goodness of the Madder greatly depending on the right drying. This person is a sort of foreman, and has the direction of all the workmen; his pay is five stivers, for every hundred weight of Madder which is prepared in the stove; he has one person under him for his assistant, to perform part of the laborious work, and to be always at hand; this man is paid eighteen or

nineteen shillings per week *Flemish*, which is the constant wages.

The third person is the pounder, who is always present when the Madder is pounding, who with a particular shovel which is small, and fitted to the cavity of the pounding block, stirs the Madder from time to time, to bring it under the stampers; he is paid four stivers for every hundred weight of Madder.

The fourth is a driver, who with a team of three horses, causes the mill to turn and pound the Madder; his pay for himself and the three horses, from eight to nine stivers per hundred weight, according as he can bargain.

Besides these four, there are five other assistants, who lay the Madder on and take it off; this is often performed by the wives and boys of the other workmen; these five have fifty stivers for every three thousand pounds of Madder which is prepared, so they have each ten stivers.

There are nineteen or twenty Madder-stoves in the island of *Schowen*, which, at an average, prepare in one crop, that lasts from *September* to *February*, ten thousand weight of Madder each, which in the whole amounts to two million-pounds weight; and if we suppose, that the Madder is sold at an average for four pounds *Flemish* per hundred weight, which is a moderate price, one may soon reckon what advantage the culture of this dyeing commodity produces to this one island.

The countrymen pay to the owners of the Madder-stoves, two guilders for preparing every hundred weight of *Mull*, and for each hundred weight of hard Madder; that is, of *Kraps*, *Gemeens*, or *Onberooftde*, three guilders, according as they will have them prepared.

In *Zealand*, Madder is cultivated by every kitchen-gardener, each having a quantity to take up annually, in proportion to the size of his garden, and most of the farmers there do the same; for as the roots require three years growth to have them in perfection, so they every spring plant a certain allotment of land for the purpose. The ground which has produced Madder, will be fresh and well prepared for other crops, in like manner as the land upon which *Asparagus* roots have grown to be taken up for forcing upon hot-beds in winter, which is practised by most of the kitchen-gardeners near *London*, for these roots are commonly allowed three years growth, by those persons who value themselves on having large *Asparagus*; so there is a great affinity in the culture of both these roots, for the land which will produce one of these crops is always good for the other. It is therefore much to be wished, that the kitchen-gardeners in *England* would undertake the culture of Madder, who are much more likely to succeed in it than any other persons; but it is feared the trouble of drying and manufacturing the roots for use, is a principal objection to this.

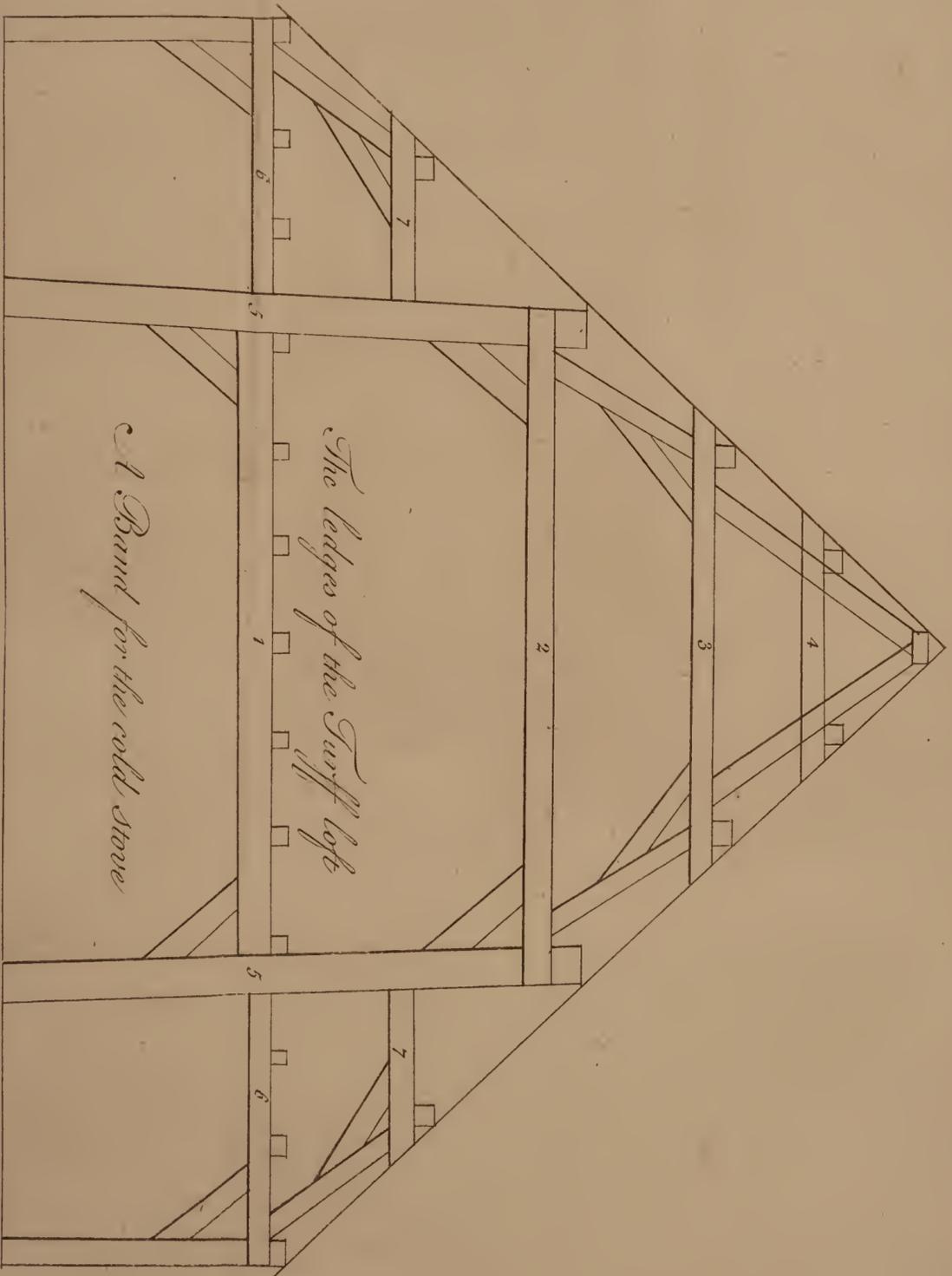
The building of a Madder-stove quite new from the foundation, costs in the whole about twenty-four hundred pounds *Flemish*, which is twelve hundred pounds sterling.

P L A T E I.

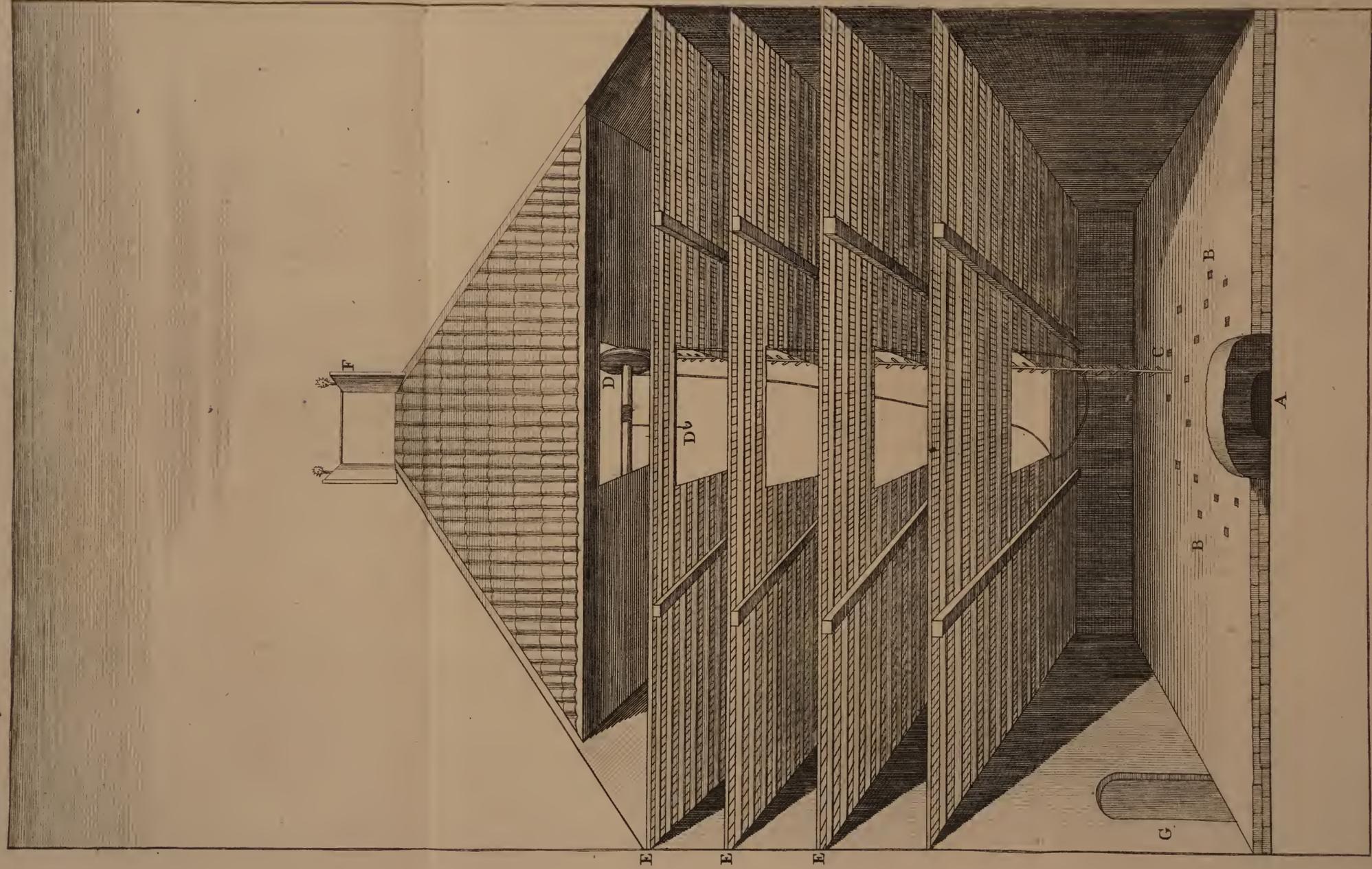
An explanation of the plan of the cold stove:

- Fig. 1. Is the lower band, whose thickness is fourteen by sixteen inches.
2. The upper band, which is twelve by fourteen inches.
 3. The cap and band, which is ten by twelve inches.
 4. The upper cap, which is six by seven inches.
 5. The two main jaumbs, which are thirteen by fifteen inches of stone.
 6. The half bands and posts of nine by seven inches.
 7. The uppermost half band, which is small, six by eight inches.

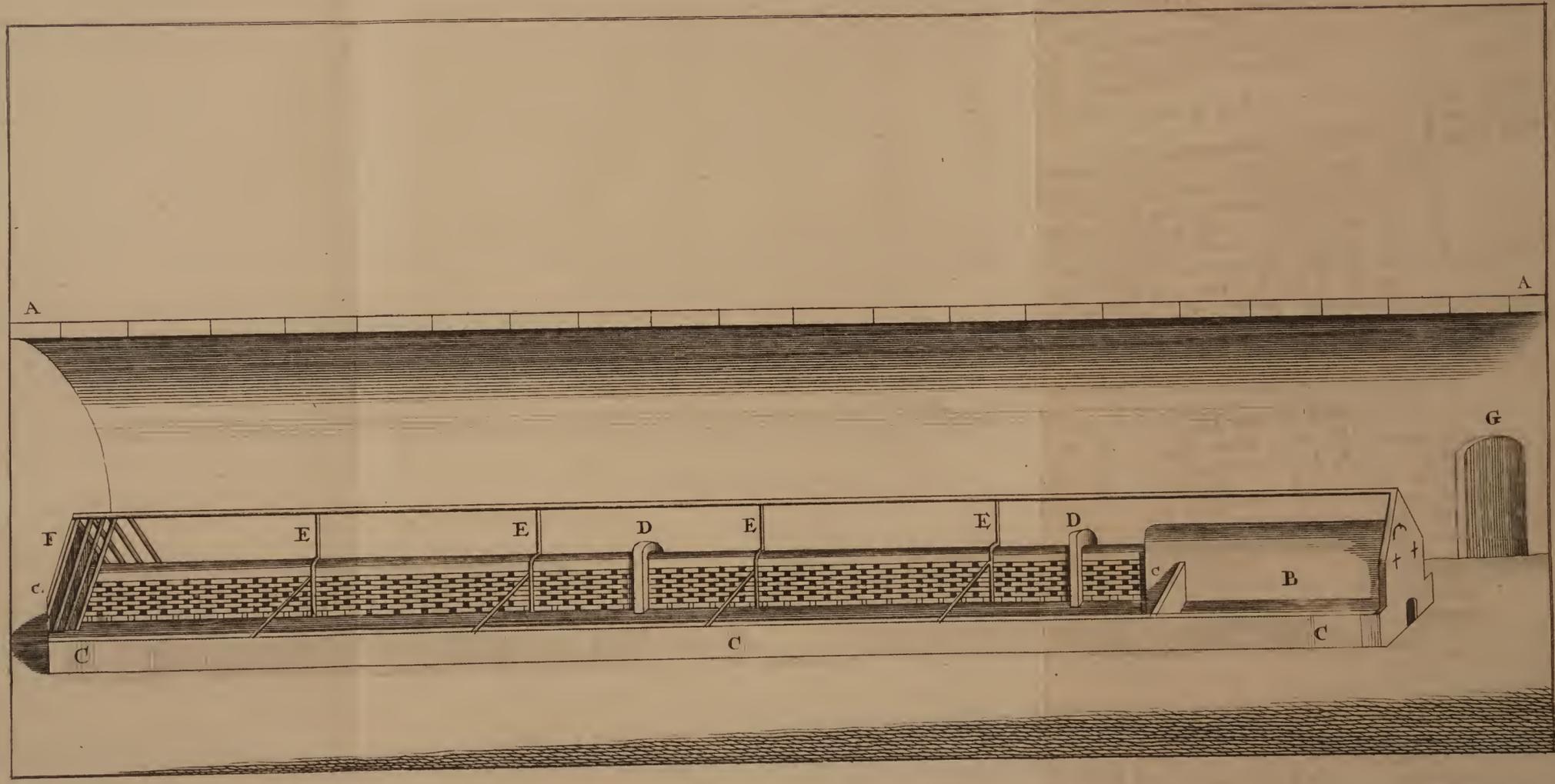
A Plan of the Structure of the Cold Store



A Plan of the Tower where the Madder is first layed to dry.



The Arched Room cut perpendicularly thro' the middle where the Kiln stands, with a representation of the Kiln.



P L A T E II.

A plan of the arched room cut through perpendicularly in the middle where the kiln stands, with a representation of the kiln.

AA Is the segment of the arch.

B The oven of the kiln which is called the Hog; this has no chimney; when the fire is first kindled either with Turf or other fuel, the smoke is let out through a small window.

CCC A stone foundation, on which the oven and kiln are built.

CC Is properly the kiln itself, which must be observed in what manner it is built, with little holes to let out the heat.

DD Stone bands made for the greater firmness, about the kiln.

EEEE Iron bars placed to strengthen the kiln, and also to lay the upper long lath upon.

F Small cross laths over the kiln, which lie from one end C to the other end C upon the kiln, but there are few of these represented, that the small holes of the kiln may better appear.

G The door of the entrance.

P L A T E III.

A plan of the tower where the Madder is first laid to dry.

A Is the oven of the tower.

BB The pipes whereby the heat spreads itself, is here shewn by the openings where the tyles are taken off.

C A sort of stairs by which they climb.

DD The windlafs with its rope and hook, to hoist the Madder to the lofts.

EEEE The four lofts of the lath of the oven.

F The chimney above the roof.

G The door by which they enter.

P L A T E IV.

An explanation of the plan of the section of the tower.

Fig. 1. 1. 1. 1. The four bands of the tower, which are sixteen inches square.

2. The cap band ten by twelve inches.

3. The springing band six by eight inches.

4. The interstice to the tower six by seven inches.

5. The spanning plate five by seven inches.

6. 6. The lower and second girder six by seven inches.

7. The third girder seven by nine inches.

8. The fourth girder six by eight inches.

9. The fifth girder six by seven inches.

10. The crown piece of the tower five by six inches.

The ribs in the tower must be laid fourteen inches asunder from middle to middle cornerways, and the laths between an inch and a half distant.

P L A T E V.

A plan of the pounding house, in which is shewn at A the driver, who with his three horses causes the mill to turn, which works the stampers: at B is shewn the pounder, who with his shovel continually brings the Madder under the stampers.

Fig. 1. Is the beam which supports the axletree, which is fourteen by fifteen inches.

2. The hollow oaken block or trough, twenty-seven by twenty-nine inches.

3. The king post eighteen inches square.

4. The upper band six by seven inches.

5. The cross bands five by seven inches.

6. The cross arms six by ten inches.

7. The swaarden six by ten inches.

8. The axis from six to eight inches.

9. The feller six by eight inches of elm wood.

10. The king beam eleven by thirteen inches of fir wood.

11. The drawers under the mill five by six inches.

12. The plate for the running of the truckle three by sixteen inches.

13. The wooden knobs to the wheel of ash.

14. The staves made of box wood.

15. The six stampers six inches square of ash.

P L A T E VI.

An explanation of the section of the pounding house.

Fig. 1. The under band sixteen inches square.

2. The upper band twelve by fourteen inches.

3. The band of the cap post ten by twelve inches.

4. The springing band six by seven inches.

5. The spanning plate five by seven inches.

6. The first girder six by seven inches.

7. The second girder nine by eleven inches.

8. The third girder six by eight inches.

9. The uppermost girder six by seven inches.

10. The top or cap four by five inches.

The above account is the method of cultivating Madder in *Zealand*, where the best Madder is now produced; to this I shall add, what I have observed of the growing of Madder in other parts of *Holland*, as also the experience I have had of the growth of Madder in *England*, with an account of the method of planting it here.

In the year 1727, I observed a great quantity of this plant cultivated in *Holland*, between *Helwoetstuyts* and the *Brill*; and it being the first time I had ever seen any considerable parcel of it, I was tempted to make some enquiries about its culture, and take some minutes of it down upon the spot, which I shall here insert, for the use of such as may have curiosity to attempt the culture of it.

In autumn they plough the land, where they intend to plant Madder in the spring, and lay it in high ridges, that the frost may mellow it; in *March* they plough it again, and at this season they work it very deep, laying it up in ridges eighteen inches asunder, and about a foot high; then about the beginning of *April*, when the Madder will begin to shoot out of the ground, they open the earth about their old roots, and take off all the side shoots which extend themselves horizontally, just under the surface of the ground, preserving as much root to them as possible; these they transplant immediately upon the tops of the new ridges, at about a foot apart, observing always to do this when there are some showers, because then the plants will take root in a few days, and will require no water.

When the plants are growing, they carefully keep the ground hoed, to prevent the weeds from coming up between them: for if they are smothered by weeds, especially when young, it will either destroy or weaken them so much, that they seldom do well after. In these ridges they let the plants remain two seasons, during which time they keep the ground very clean; and at *Michaelmas*, when the tops of

the plants are decayed, they take up the roots and dry them for sale. This is what I could learn of their method of cultivating this plant, to which I will subjoin a few observations of my own, which I have since made upon the culture of Madder in *England*.

The land upon which I have found Madder thrive best, is a soft sandy loam, and if it has been in tillage some years, it will be better than that which is fresh broken up. This should have at least a depth of two feet and a half, or three feet of good earth, and must be quite clear from couch, or the roots of any bad weeds; for as the roots of Madder should remain three years in the ground, so where there are any of those weeds which spread and multiply at their roots, they will intermix with the Madder roots, and in three years will have taken such possession of the ground, as to greatly weaken the Madder, and render it very troublesome to separate when the Madder is taken up.

The ground should be ploughed deep before winter, and laid in ridges to mellow; and if it is not too strong, there will be no necessity for ploughing it again, till just before the time of planting the Madder, when the land should be ploughed as deep as the beam of the plough will admit; and there should be men following the plough in the furrows, who should dig a full spit below the furrow, and turn it up on the top of the baulk; by preparing the ground of this depth, the roots of the Madder will strike down, and be of greater length, in which the goodness of the crop chiefly consists. The land being thus prepared and made level, will be fit to receive the plants. The best time for planting of the Madder, is about the middle, or in the latter end of *April*, according as the season is more or less forward, which must be determined by the young shoots; for when these are about two inches above ground, they are in the best state for planting.

In the taking up of these shoots for planting, the ground should be opened with a spade, that they may be separated from the mother plants with as much root as possible; for if the roots are broken off, they will not succeed: these plants should be drawn up no faster than they are planted, for if they lie long above ground, they will shrink, and their tops will wither, and then they often miscarry; therefore if they are brought from a distant place, there should be great care taken in the packing of them up for carriage; especial regard should be had not to pack them so close, or in so great quantity, as to cause them to heat, for that will soon spoil them; but if they are a little withered by lying out of the ground, their roots should be set upright in water for a few hours, which will stiffen and recover them again.

In the planting of Madder, there are some who make the rows but one foot asunder, others one foot and a half, some two feet, and others who allow them three feet distance. I have made trial of the three last distances, and have found when the roots have been left three years in the ground, that three feet distance row from row is the best; but if it is taken up in two years, two feet asunder may do very well; and the distance in the rows plant from plant, should be one foot, or a foot and a half.

If there is no danger of the ground being too wet in winter, the plants may be planted on the level ground; but if on the contrary, the ground should be raised in ridges where each row of plants is to be set, that their roots may not reach the water in winter, for if they do, it will stop their downright growth; and this is the reason for the *Dutch*, who plant Madder in the *Low Countries*, raising their ridges so high as two or three feet, and in *Zealand*, where the ground is drier, they raise the beds four or five inches above the intervals, that the wet may drain off from the beds where the Madder is planted.

The method of planting is as follows, *viz.* The ground

being made smooth, a line is drawn cross it to mark out the rows, that they may be strait for the more convenient cleaning, and for the better digging or ploughing of the ground between the rows; then with an iron-shod dibble, holes are made, at the distance which the plants are to stand from each other. The depth of the holes must be in proportion to the length of the roots of the plants, which must be planted the same depth they had been while they were upon the mother plants; for if any part of the root is left above ground, the sun and winds will dry them, which will retard the growth of the plants; and, should any part of the green be buried in the ground, it will not be so well, though, of the two, the latter will be less prejudicial, especially if there is not too much of the green buried. When the plants are put into the holes, the earth should be pressed close to them to secure them from being drawn out of the ground, for crows and rooks frequently draw the new plants out of the ground, before they get new roots, where there is not this care taken; so that in two or three days, I have known half the plants on a large piece of land destroyed by these birds.

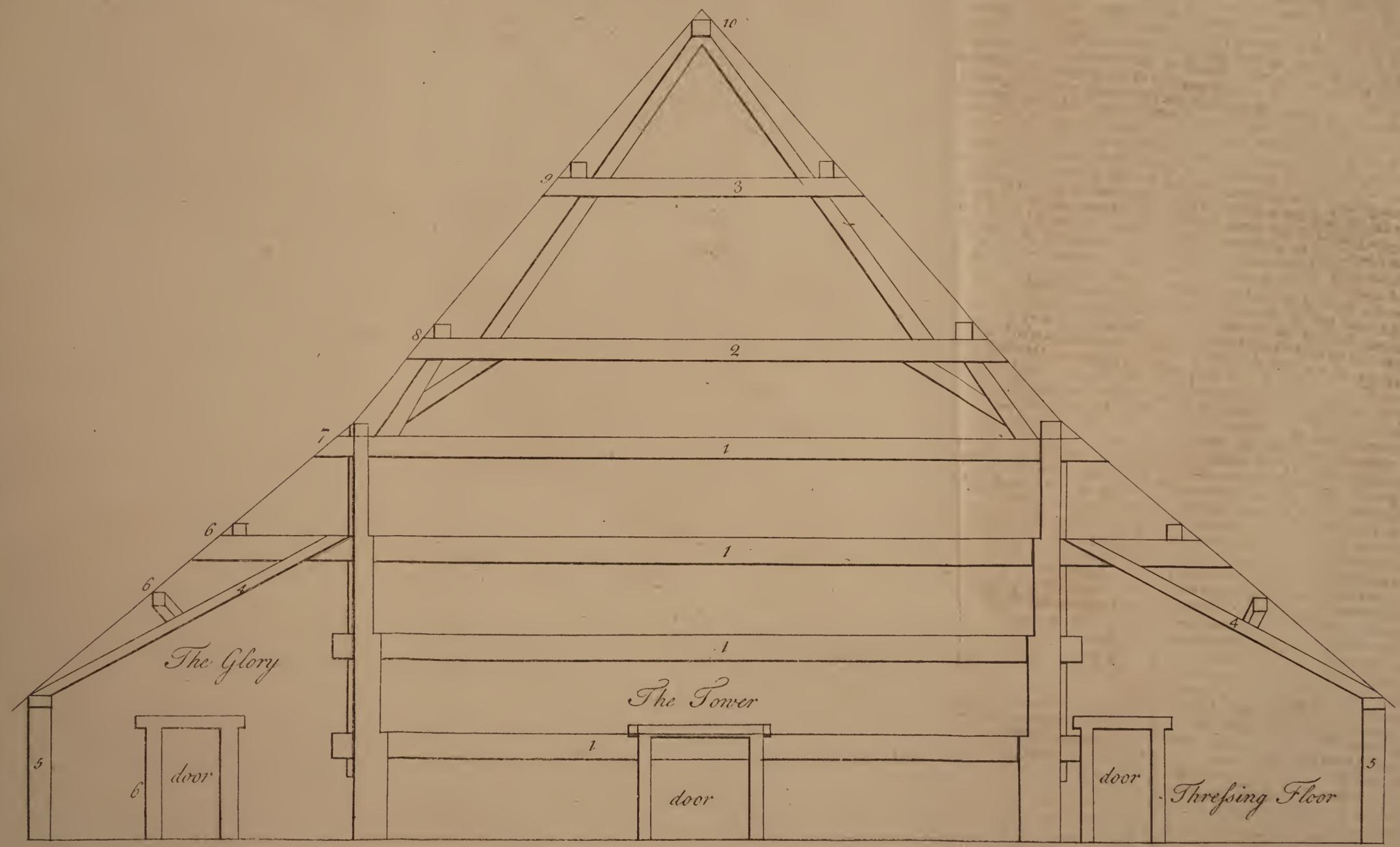
If there happens to be some showers of rain fall in a day, or two after the plants are planted, it will be of great service to them, for they will presently put out new roots, and become strong, so that, if dry weather should afterward happen, they will not be in so much danger of suffering thereby, as those which are later planted. There are some who, from a covetous temper of making most use of the ground, plant a row of dwarf Peas, or Kidney-beans, between each row of Madder, and pretend that hereby the land is kept cleaner from weeds; but I am very certain the crop of Madder is injured thereby much more than the value of those things which grow between the rows, as I have experienced; therefore I advise those persons who plant Madder, never to sow or plant any thing between the rows, but to keep the Madder quite clean from weeds, or any other kind of vegetable.

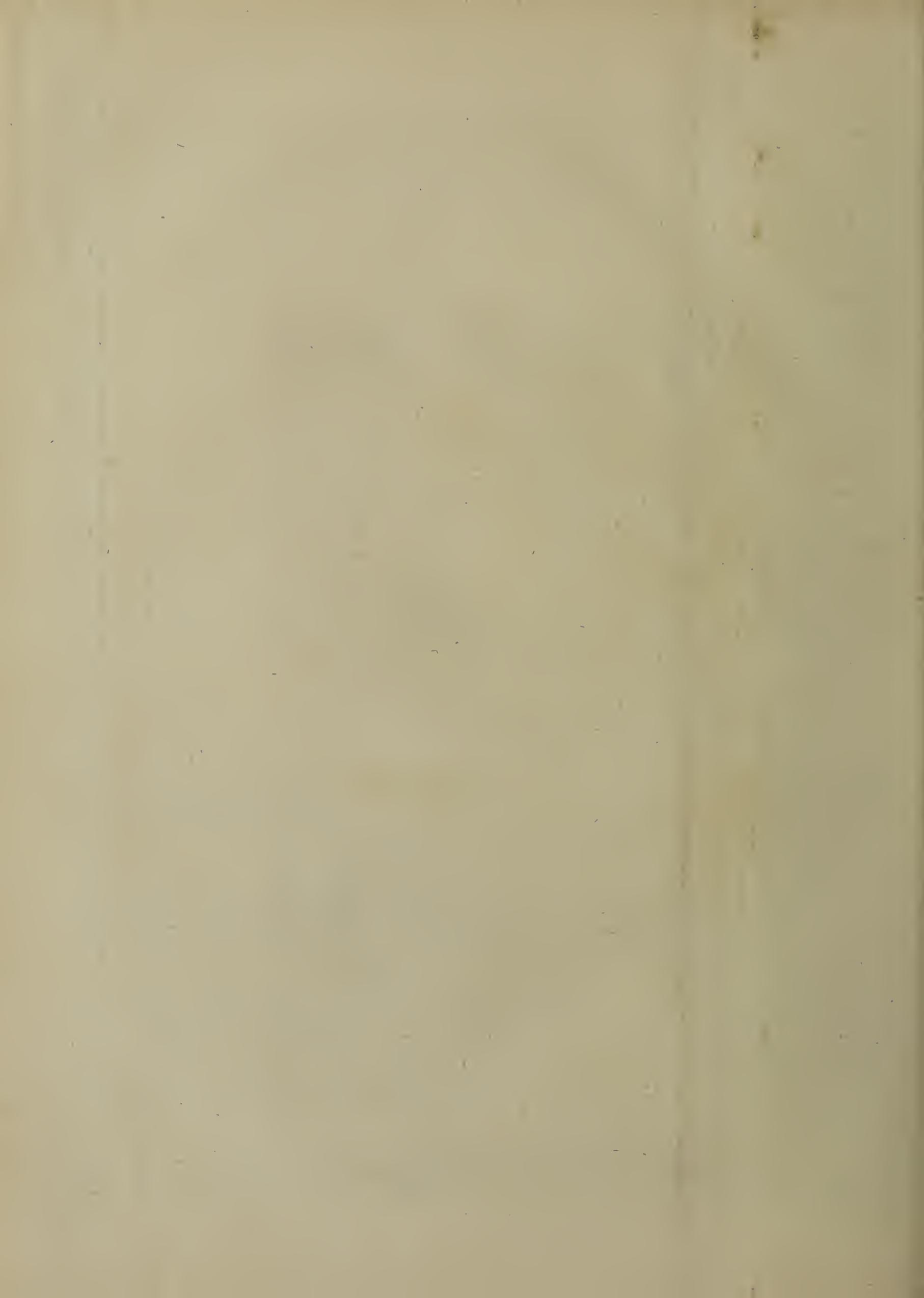
In order to keep the ground thus clean, it should be scuffled over with a *Dutch* hoe, as soon as the young weeds appear; at which time a man can perform a great deal of this work in a day, and if it is done in dry weather, the weeds will die as fast as they are cut down; whereas, when the weeds are left to grow in the spring, so as to get strength, they are not so soon destroyed; and the expence of hoeing the ground then will be more than double; besides, there will be danger of cutting down some of the weaker plants with the weeds, if the persons employed to perform this work are not very careful, therefore it is much cheaper, as also better for the Madder, to begin this work early in the spring, and to repeat it as often as the weeds render it necessary; for by keeping the ground thus constantly clean, the Madder will thrive the better.

During the first summer, the only culture which the Madder requires, is that of keeping it clean in the manner before directed, and, when the shoots or haulm of the plants decay in autumn, it should be raked off the ground; then the intervals between the rows should be either dug with a spade, or ploughed with a hoeing plough, laying up the earth over the heads of the plants in a roundish ridge, which will be of great service to the roots. The *Dutch* cover the haulm of their Madder with earth, leaving it to rot upon the ground; this perhaps may be necessary in their country to keep the frost out of the ground, but, as I have never found that the severest winters in *England* have injured the Madder roots, there is not the same necessity for that practice here.

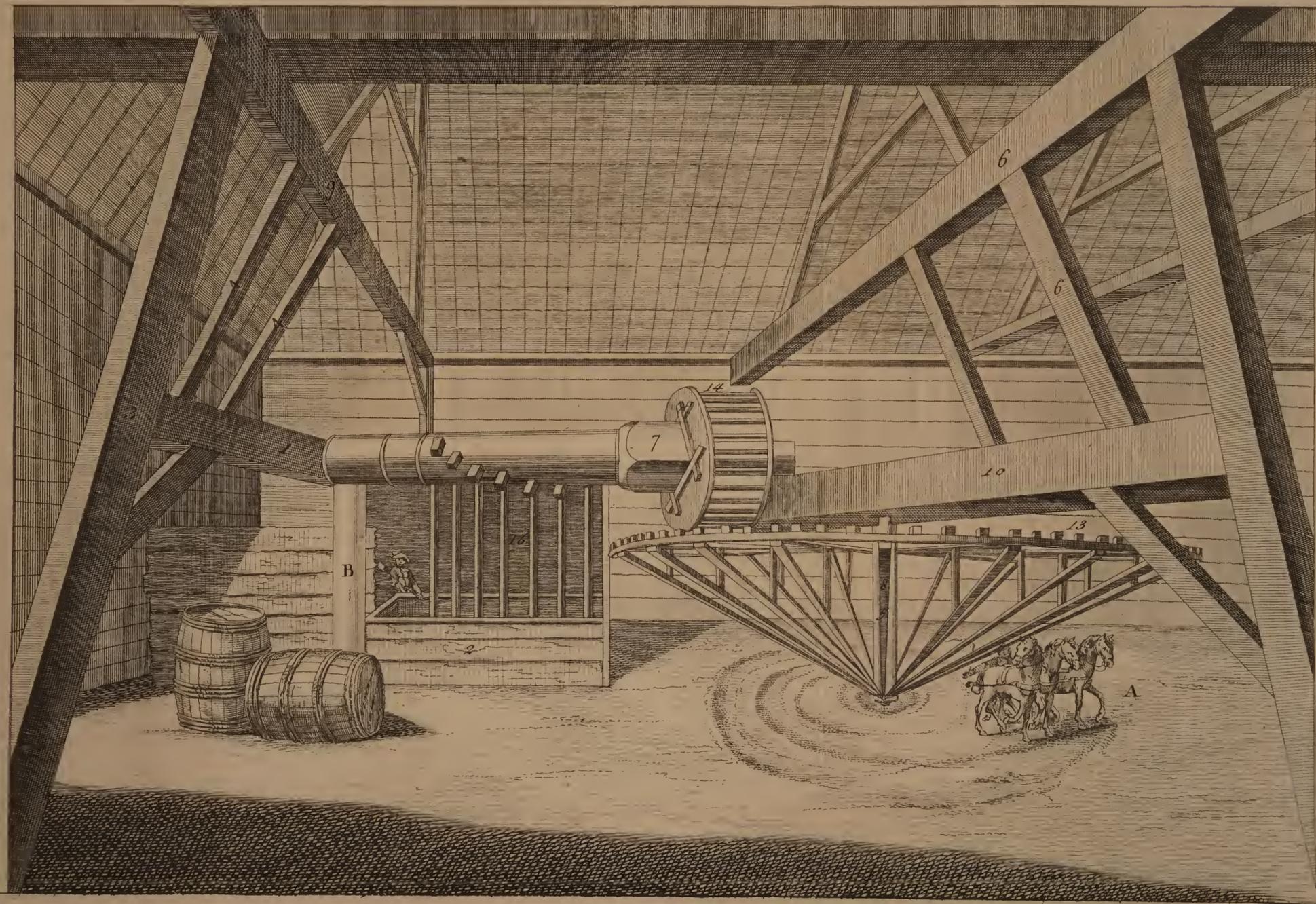
The following spring, before the Madder begins to shoot, the ground should be raked over smooth, that the young shoots may have no obstruction, and, if there should be any young

A Section of the Tower

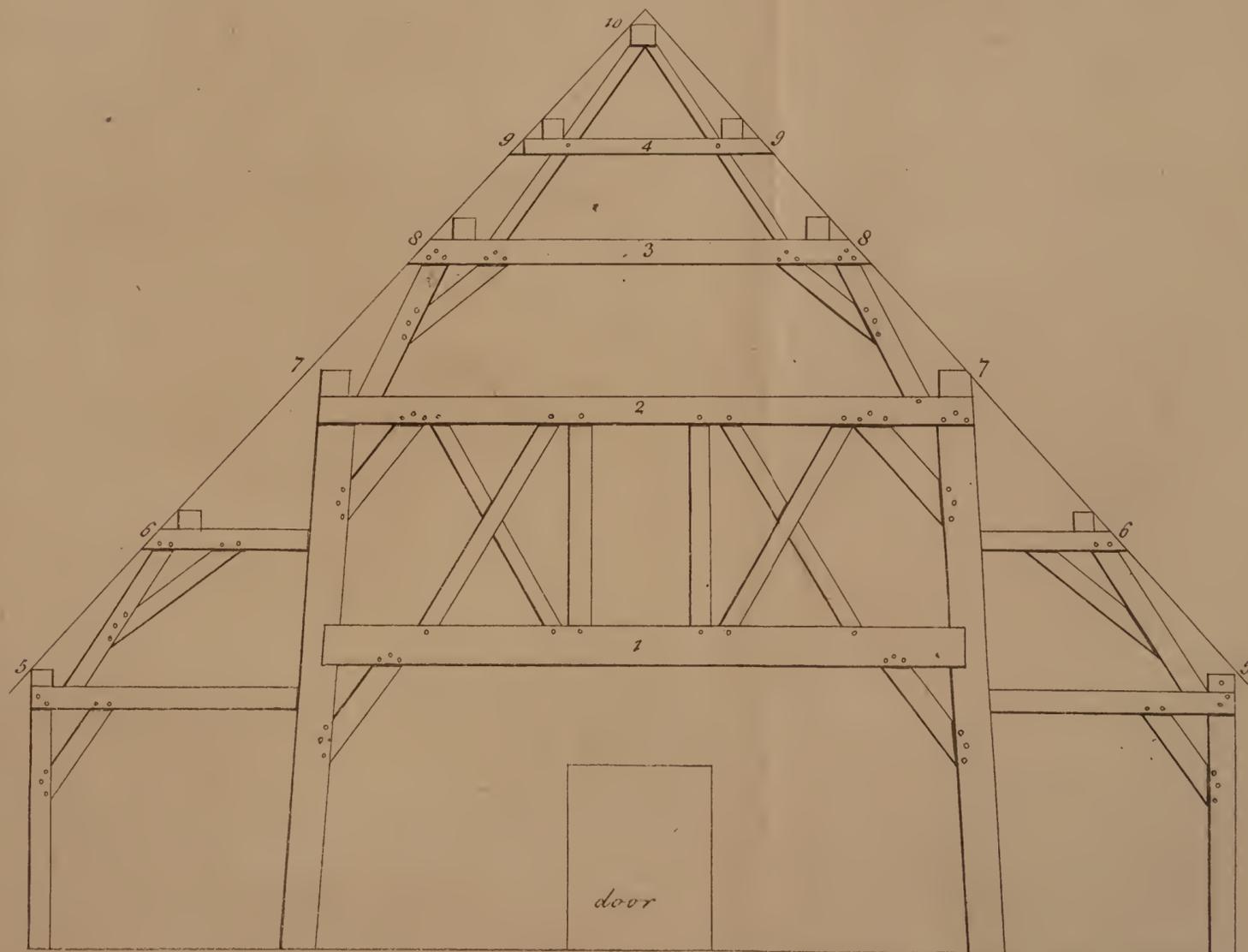




A Plan of the Pounding House.



A Section of the Pounding House.



young weeds appearing on the ground, it should be first scuffled over to destroy the weeds, and then raked over smooth; after this the same care must be taken in the following summer to keep the ground clean, and, if it is performed by the hoe plough, the earth of the intervals should be thrown up against the side of the ridges, which will earth up the roots, and greatly increase their strength; but, before the ground of one interval is so hoed, the haulm of the plants should be turned over to the next adjoining interval, and, if they are permitted so to lie for a fortnight or three weeks, and then turned back again on those intervals which were hoed, observing first to scuffle the ground to destroy any young weeds, which may have appeared since the stirring of the ground, then the alternate intervals should be ploughed in like manner, turning the earth up against the opposite sides of the roots; by this method the intervals will be alternately ploughed, and the plants earthed up, whereby the ground will be kept clean and stirred, which will greatly promote the growth of the roots; and by this method the superficial shoots will be subdued, and the principal roots greatly strengthened. The following autumn the ground should be cleared of the haulm and weeds, and the earth raised in ridges over the roots, as in the foregoing year.

The third spring the roots will furnish a great supply of young plants, but, before these appear, the ground should be cleaned and raked smooth, that the shoots may have no obstruction to their coming up; and, when the young plants are fit to take off, it should be performed with care, always taking off those which are produced at the greatest distance from the crown of the mother plants, because those are what rob them most of their nourishment, and the wounds made by separating them from the old roots are not near so hurtful as those near the crown, for the stripping off too many of the shoots there will retard the growth of the plants.

The culture of the Madder in the third summer, must be the same as the second, but, as the roots will then be much stronger, the earth should be laid up a little higher to them at the times when the ground is cleaned; and, if all the distant superficial shoots, which come up in the intervals, are hoed or ploughed off, it will be of service to strengthen the larger downright roots, and, as the haulm will now be very strong and thick, the frequent turning it over, from one interval to another, will prevent its rotting, for if it lies long in the same position, the shoots which are near the ground, where there will be always more or less damp, and being covered with the upper shoots, the air will be excluded from them, which will cause them to rot; for the shoots of Madder are naturally disposed to climb upon any neighbouring support, and in places where they have been supported, I have seen them more than ten feet high; but the expence of staking the plants to support their shoots, would be much too great to be practised in general, therefore the other method of turning the haulm over from one interval to the other, will be found of great use, for hereby it is kept from decaying, and by so doing the sun is alternately admitted to each side of the roots, which is of more consequence to the growth of the Madder than most people conceive, from many repeated trials I have found, that where the haulm has decayed or rotted in summer, it has greatly retarded the growth of the roots. There have been some ignorant pretenders who have advised the cutting off the haulm in summer, in order to strengthen the roots, but whoever practises this, will find to their cost the absurdity of this method, for I have fully tried this many years ago, and have always found that every other root, upon which this was practised, was at least a third part smaller than the intermediate roots, whose haulm was left entire. The occasion of my first making this experiment

was, because the plants had been set too near each other, and the season proving moist, had increased the number and strength of the shoots, so that they were so thick, as that many of them began to rot; to prevent which, I cut off the shoots of every other plant to give room for the others to spread; but soon after this was done, the plants produced a greater number of shoots than before, which were weaker, and the effect it had upon the roots was as before related; since then I have frequently repeated the experiment on a few roots, and have always found the effect the same.

As soon as the haulm of the Madder begins to decay in autumn, the roots may be taken up for use, because then the roots have done growing for that season, and will then be plumper and less liable to shrink than if they are dug up at another season; for I have always found that roots of every kind of plant, which are taken out of the ground during the time of their growing, are very apt to shrink, and lose more than half their weight in a short time.

When the season for digging up the Madder roots is come, it should be done in the following manner, *viz.* A deep trench should be dug out at one side of the ground next to the first row of Madder, to make a sufficient opening to receive the earth, which must be laid therein in digging up the row of roots, so that it should be at least two feet broad, and two spits and two shovelings deep: this should be made as close as possible to the roots, being careful not to break or cut them in doing it; then the row of roots must be carefully dug up, turning the earth into the trench before mentioned. In the doing of this, there should be to every person who digs, two or three persons to take out the roots as entire as possible, that none may be lost, and as much of the earth should be shaken out of the roots as can be done, for after the principal roots are taken up, there will be many of the long fibres remaining below, which break off; therefore, in order to get the roots as clean as possible, the whole spot of ground should be dug of the same depth as the first trench, and the pickers must follow the diggers to get them all out to the bottom. As the digging of the land to this depth is necessary, in order to take up the roots with as little loss as possible, it is a fine preparation for any succeeding plants; and I have always found that the ground, where the Madder has grown, produced better crops of all kinds than lands of equal goodness, which had not the like culture, especially those plants with tap-roots, as Carrots and Parsneps.

After the roots are taken up, the sooner they are carried to the place of drying, the finer will be their colour, for if they lie in heaps, they are apt to heat, which will discolour them; or if rain should happen to wet them much, it will have the same effect, therefore no more roots should be taken up than can be carried under shelter the same day.

The first place in which the roots should be laid to dry, must be open on the sides to admit the air, but covered on the top to keep out the wet. If a building is to be erected new, such as the tanners have for drying their skins will be as proper as any, for these have weather-boards from top to bottom, at equal distances, to keep out the driving rain, but the spaces between being open, admit the air freely; and if instead of plank-floors or stages above each other, they are laid with hurdles or basket work, upon which the roots are laid to dry, the air will have freer passage to the under side of the roots, which will dry them more equally.

In this place they may remain four or five days, by which time the earth, which adhered to the roots, will be so dry as to easily rub off, which should be done before the roots are removed to the cold stove, for the slower the roots are dried, the less they will shrink, and the better will be the colour of the Madder; and the cleaner the roots are from earth,

earth, the better the commodity will be for use when prepared.

After the roots have laid a sufficient time in this place, they should be removed into another building called the cold stove, in which there should be conveniencies of flues passing through different parts of the floor and the side walls; in this the roots should be laid thin upon the floors, and turned from time to time as they dry, taking those roots away, which are nearest to the flues that convey the greatest heat, placing them in a cooler part of the room, and removing such of them as had been in that situation to the warmer, from whence the other are taken. The constant care in this particular will be of great service to the quality of the Madder, for, when this is properly conducted, the roots will be more equally dried, and the commodity, when manufactured, will be much fairer and better for use.

When the outside of the roots has been sufficiently dried in this cold stove, they should be removed to the threshing floor, which may be the same as in a common barn where Corn is threshed. The floor of this should be swept, and made as clean as possible; then the roots should be threshed to beat off their skins or outside coverings; this is the part which is prepared separately from the inner part of the root, and is called Mull, which is sold at a very low price, being the worst sort of Madder, so cannot be used where the permanency or beauty of the colours are regarded; these husks are separated from the roots, pounded by themselves, and are afterward packed up in separate casks, and sold by the title of Mull. If this is well prepared, and not mixed with dirt, it may be sold for about fifteen shillings *per* hundred weight, at the price which Madder now bears, and this, as is supposed, will defray the whole expence of drying the crop.

After the Mull is separated from the roots, they must be removed to the warmer stove, where they must be dried with care, for if the heat is too great, the roots will dry too fast, whereby they will lose much in weight, and the colour of the Madder will not be near so bright; to avoid which, the roots should be frequently turned, while they remain in this stove, and the fires must be properly regulated. If some trials are made by fixing a good thermometer in the room, the necessary heat may be better ascertained than can be done any other way; but this will require to be greater at some times than at others, according as the roots are more or less succulent, or the weather more or less cold or damp; but it will always be better to have the heat rather less than over-hot, for, though the roots may require a longer time to dry with a slow heat, yet the colour will be the better.

When the roots are properly dried in this stove, they must be carried to the pounding-house, where they must be reduced to powder in the manner before related; but whether it is necessary to separate the Kraps from the Gemeens, as is now practised by the *Dutch*, the consumers of Madder will be better judges than myself.

There has been some objections of late made to the introducing or rather retrieving the culture of Madder in *England*, which it may be proper here to take notice of, lest they should have so much weight as to prevent many persons from engaging in it. The first which has been generally started is, that the land in this country is not so well adapted for growing Madder, as that in *Holland*, to which I can with truth affirm, that there are vast tracts of land here much better adapted for producing Madder than the best land in *Zealand*, and from the experience, which I have had of its growth, will produce a greater crop.

Another objection which I have heard, was the labour in *Holland* being cheaper than in *England*. The *Dutch* will always undersell us, so consequently will maintain this

branch of trade; but this is certainly a great mistake, for, though the labourers employed in cultivating Madder, may not earn so great wages as is generally paid in *England*, sure I am that the difference between an expert *English* labourer, and that of the best *Dutchman*, in the ploughing, hoeing, planting, &c. of Madder, is much greater than that of their pay; for I am sure a good *English* gardener or ploughman will do more business, and perform it better, in four days, than the best workman in *Holland* can do in six. What I now say is greatly within compass from my own knowledge; so that, supposing we were to proceed in the same manner now practised by the *Dutch*, this could be no objection to the cultivating of Madder; but we shall soon find ways of performing the most laborious part, at much less expence, by means of the hoeing-plough, which may be used to great advantage in the cultivation of Madder, whereby the expence will be much lessened, and, when once this is well established in *England*, there can be no doubt but that great improvements will be made both in the culture and method of preparing the commodity for use.

There has been objections made against farther trials of growing Madder, because some who have engaged in it, have not succeeded; but in answer to this, it must be observed, that their ill success was owing to a want of skill. Some of them continued to plant repeated crops of Madder on the same spot of ground, till the roots became so small, as scarce to pay the expence of digging up; and here it is proper to observe, that Madder should not be planted on the same land, till after an interval of seven or eight years, during which interval the ground may be sown with any sort of grain, or kitchen vegetables, which it will produce to great advantage after Madder, because the land will be wrought so deep. The *Dutch* always sow grain upon their Madder ground in the intervals of four years, and have great crops from it; and they are obliged, from the scarcity of land fit for this purpose, to plant the same ground after an interval of four years; but, as we are not under the same necessity, it will be much better to stay eight years, for the roots of Madder are very similar to those of *Asparagus*, and draw much the same nourishment from the ground; and it is well known that, when *Asparagus* roots are dug up, which have been growing three years, if the same ground is planted with *Asparagus* again in a few years, it will not thrive equal to that which is planted on ground, upon which *Asparagus* has not grown for several years; and this is always found to be the case even in kitchen-gardens near *London*, where, by the well working and frequent dunging of the ground, it may be supposed changed in three or four years, more than the fields can possibly be in eight or ten.

Madder should not be planted in very rich dunged land, for in such there will be very large haulm, but the roots will not be in proportion; and, where there is much dung or sea-coal ashes, the Madder roots will be of a darker colour, as it also will, where it is cultivated in the smoak of *London*, which is likewise the case with *Liquorice*, for that, which grows in a sandy loam at a distance from *London*, is always much brighter and clearer than that which grows in the rich lands in the neighbourhood of *London*.

If the cultivation of Madder is carried on properly in *England*, it will employ a great number of hands from the time harvest is over, till the spring of the year, which is generally a dead time for labourers, and hereby the parishes may be eased of the poor's rate, which is a consideration worthy of publick attention.

RUBEOLA. See *Asperula*, *Galium*, and *Sherardia*.

RUBUS. *Tourn. Inst. R. H.* 614. *tab.* 315. Bramble, or Raspberry Bush.

The Characters are,

The flower has a permanent empalement, which is cut into five spear-shaped segments; it hath five roundish petals, which are inserted in the empalement, and a great number of stamina, which are also inserted in the empalement, terminated by roundish compressed summits, with a great number of germen, having small hair-like styles on the side of the germen, crowned by permanent stigmas. The germen afterward becomes a berry, composed of many acini, collected into a head, each having one cell, in which is contained one oblong seed.

The Species are,

1. RUBUS foliis quinato-digitatis ternatisque, caule petiolisque aculeatis. Flor. Suec. 409. Bramble or Blackberry with hand-shaped leaves, having five and three lobes, and the foot-stalk and branches prickly; the common Blackberry.

2. RUBUS foliis ternatis nudis, caule aculeato. Hort. Cliff. 192. Bramble with naked trifoliate leaves, and a prickly stalk; the Dewberry.

3. RUBUS foliis quinato-pinnatis ternatisque, caule aculeato, petiolis canaliculatis. Flor. Suec. 408. Bramble with winged leaves, having five and three lobes, a prickly stalk, and channelled foot-stalks; prickly Raspberry.

4. RUBUS foliis ternatis subtus tomentosus, caule glabro. Raspberry with trifoliate leaves, which are woolly on their under side, and have a smooth stalk.

5. RUBUS foliis quinato-pinnatis ternatisque, caule aculeato, petiolis teretibus. Lin. Sp. Plant. 493. Bramble with winged leaves, having five and three lobes, a prickly stalk, and taper foot-stalks; Virginia Raspberry with a black fruit.

6. RUBUS foliis simplicibus palmatis, caule inermi multifloro multifloro. Hort. Cliff. 192. Raspberry with single hand-shaped leaves, and an unarmed stalk, having many flowers; commonly called flowering Raspberry.

7. RUBUS foliis ternatis nudis, caulibus petiolisque hispida. Lin. Sp. Plant. 493. Bramble with naked leaves growing by threes, and hairy stalks and foot-stalks.

8. RUBUS foliis ternatis nudis, flagellis repentibus herbaccis. Flor. Suec. 411. Bramble with naked trifoliate leaves, and creeping herbaceous stalks; dwarf Rock Bramble.

9. RUBUS foliis ternatis, caule inermi unifloro. Flor. Suec. 412. Bramble with trifoliate leaves, and an unarmed stalk having one flower.

10. RUBUS foliis simplicibus lobatis, caule unifloro. Flor. Suec. 413. Bramble with single leaves, having lobes, and a stalk bearing one flower; the Cloudberry.

The first sort grows naturally on the side of banks, and in hedges in most parts of England, so is not cultivated in gardens; this is so well known as to need no description. Of this there are the following varieties:

1. The common Bramble with white fruit, which was found in a hedge near Oxford by Mr. Jacob Bobart. The branches of this sort are covered with a light green bark; the leaves are of a brighter green than the common sort, and the fruit is white, but it seldom produces fruit in gardens.

2. The Bramble without thorns; this is in every respect like the first, but the branches and foot-stalks have no thorns.

3. The Bramble with elegant cut leaves; this differs from the first, by having the leaves more finely cut.

4. The Bramble with double flowers; this differs from the first in having very double flowers, so is frequently planted in gardens for ornament.

5. The Bramble with variegated leaves; this is by some preserved in gardens, but it is very apt to become plain, if planted in good ground.

These sorts are easily propagated by laying down their branches, which will put out roots at every joint very freely. They may be transplanted any time from September to March, and will grow in almost any soil or situation.

The second sort hath weaker trailing stalks than the first;

the leaves are trifoliate, and the lobes are larger than those of the other; the fruit is smaller, the acini larger, and but few in each, which are of a deeper black colour. This grows naturally in England, and is known by the title of Dewberry.

The third sort is the Raspberry, which grows naturally in the woods in the northern parts of England, but is cultivated in gardens for its fruit, which supplies the table at the season when they are ripe. There are two or three varieties of this, one with a red, and the other a white fruit, and the third generally produces two crops of fruit annually; the first ripens in July, and the second in October, but those of the latter season have seldom much flavour. These are accidental varieties, but the fourth sort I believe to be a distinct species, for the leaves are trifoliate, larger than those of the common sort, woolly on their under side, and the branches and stalks have no thorns. This produces but few fruit, and those are small, which has occasioned its being neglected.

The Raspberry is generally propagated by suckers, though I should prefer such plants as are raised by layers, because they will be better rooted, and not so liable to send out suckers as the other, which generally produce such quantities of suckers from their roots, as to fill the ground in a year or two; and where they are not carefully taken off, or thinned, will cause the fruit to be small, and in less quantities, especially when the plants are placed near each other, which is too often the case, for there are few persons who allow these plants sufficient room.

In preparing these plants, their fibres should be shortened; but the buds, which are placed at a small distance from the stem of the plant, must not be cut off, because those produce the new shoots the following summer. These plants should be planted about two feet asunder in the rows, and four or five feet distance row from row; for if they are planted too close, their fruit is never so fair, nor will ripen so kindly, as when they have room for the air to pass between the rows. The soil in which they thrive best, is a fresh strong loam, for in warm light ground they do not produce so great plenty of fruit, for they naturally grow in cold land, and in shade; therefore when they are planted in a warm situation and a light soil, they do not succeed.

The season for dressing of them is in October, at which time all the old wood that produced fruit the preceding summer, should be cut down below the surface of the ground, and the young shoots of the same year must be shortened to about two feet in length; then the spaces between the rows should be well dug, to encourage their roots; and if you bury a very little rotten dung therein, it will make them shoot vigorously the following summer, and their fruit will be much fairer. During the summer season, they should be kept clear from weeds, which, with the before-mentioned culture, is all the management they will require; but it is proper to make new plantations once in three or four years, because when the plants are suffered to remain long, they will produce few and small fruit.

The Virginian flowering Raspberry is commonly propagated in the nurseries as a flowering shrub. The flowers of this sort are as large as small Roses, and there is a succession of them for two months or more, so that they make an agreeable variety during their continuance. This sort frequently produces fruit in England, which are not so large as those of the common sort, and have little flavour. These ripen in September, or the beginning of October.

The Virginian Raspberry rises with purplish stalks a little higher than the common sort; the leaves are of a lucid green on their upper side, but hoary on their under; their foot-stalks are taper; the fruit is shaped like those of the common Blackberry, and are of a deep black when ripe; the

the fruit has little flavour, so the plants are never cultivated for their fruit here. It ripens late in autumn.

The eighth sort grows naturally upon rocky hills in the northern counties of *England*, and most of the northern parts of *Europe*. This hath trailing herbaceous stalks, which put out roots at their joints, whereby it propagates in plenty; the leaves are trifoliate; the lobes are large, and of a lucid green; the fruit are small, so not worth cultivating.

The ninth sort grows naturally in *Norway*, *Sweden*, and *Siberia*; this hath an upright stalk about three inches high, garnished with small trifoliate leaves; the stalk is terminated by one purple flower, which is succeeded by a small red fruit, having the scent and flavour of Strawberries. This plant grows naturally upon mossy bogs, so cannot be cultivated to any purpose on dry ground, and is preserved in a few gardens for the sake of variety.

The tenth sort grows naturally upon some of the highest hills in the north of *England* and *Scotland*, also upon high boggy places in the northern parts of *Europe*. This plant cannot be transplanted into gardens so as to thrive; the stalks rise about six or eight inches high, and are generally garnished with two lobated leaves, standing at a distance from each other. The stalk is terminated by a single flower, which is succeeded by a small black fruit, not much unlike that of the Dewberry.

RUDBECKIA. *Lin. Gen. Plant.* 878. Dwarf Sunflower, *vulgò.*

The Characters are,

It hath female and hermaphrodite florets, inclosed in one common empalement, composed of two orders of leaves, the scales of which are plain, broad, and short. The rays or border of the flower is composed of female half florets, which end with two or three indentures; these have germen sitting upon proper receptacles, but have neither style or stamina, and are barren. The hermaphrodite florets are tubulous, funnel-shaped, and indented in five parts at the brim. They have five short hair-like stamina in each, terminated by cylindrical summits, and a germen sitting in the common empalement, having a slender style, crowned by a reflexed stigma, divided in two parts. The germen afterward becomes single, oblong, four-cornered seeds, crowned by their proper cup, which has four indentures.

The Species are,

1. **RUDBECKIA** *foliis indivisis spatulato-ovatis; radii petalis emarginatis.* *Lin. Sp. Plant.* 907. Rudbeckia with oval, spattle-shaped, undivided leaves, and the petals of the rays indented; commonly called Dwarf American Sunflower.

2. **RUDBECKIA** *foliis lanceolato-ovatis alternis indivisis, petalis radii bifidis.* *Flor. Virg.* 104. Rudbeckia with oval, spear-shaped, undivided leaves, placed alternate, and the petals of the ray bifid; commonly called Dwarf Carolina Sunflower.

3. **RUDBECKIA** *foliis inferioribus trilobis, superioribus indivisis.* *Hort. Upsal.* 269. Rudbeckia with under leaves, having three lobes, and the upper ones entire.

4. **RUDBECKIA** *foliis inferioribus compositis acutè dentatis, caulinis simplicibus dentatisque.* Rudbeckia with compound, indented, lower leaves, those upon the stalks single and indented.

5. **RUDBECKIA** *foliis omnibus quinatis, acutè dentatis exterioribus trilobatis.* Rudbeckia with all the leaves composed of five lobes, which are sharply indented, and the outer ones divided into three.

6. **RUDBECKIA** *foliis inferioribus compositis, caulinis quinatis ternatisque, summis simplicibus.* Rudbeckia with compound lower leaves, those on the stalks quinquifoliate and trifoliate, and the top ones single.

The first sort grows naturally in *Virginia*, and several other parts of *North America*. The root of this will continue four or five years, but unless there is care taken to

shelter it in winter, the plants are often destroyed by cold or too much wet. This sort sends out heads, by which it may be propagated; the leaves are oblong, oval, and hairy; the stalks rise a foot and a half high, having one or two leaves near the bottom. The foot-stalk which supports the flower, is naked near a foot in length, and is terminated by one pretty large yellow flower, shaped somewhat like the Sunflower, from whence it was titled Dwarf Sunflower. The petals or rays of the flower are very stiff, and slightly indented at their points; the middle or disk of the flower is very prominent, pyramidal, and of a dark purple colour. These flowers are of long duration, for I have frequently observed one flower has continued in beauty near six weeks; and as the plants produce many flowers, so there is a succession of them on the same plant, from the middle of *July* till the frost puts a stop to them, which renders the plants more valuable. This sort will sometimes produce good seeds in *England*, when the seasons are favourable; but they are generally propagated here by offsets or slips, unless when good seeds can be procured either here or from *America*. The best time to separate the offsets is in the spring, because the plants continue to flower so late in autumn, as to render it impracticable to perform it till it is late, so that the frost will set in before the slips can have taken root. The plants will live abroad in the open air through the winter, if they are planted in a dry soil and a warm situation; but it will always be prudent to shelter two or three plants under a common hot-bed frame in winter to preserve the kind, because in very severe winters those in the open air are often killed.

The second sort grows naturally in *Carolina*, and also in *Virginia*. This is a perennial plant like the former, but very rarely produces seeds in *England*; nor do the plants put out heads, whereby it may be propagated like the other, so that it is at present not very common here. The leaves of this sort are longer and broader than those of the other, and are smooth, having three veins; the foot-stalks which support the flowers are taller, and have two or three narrow leaves on each, which are placed alternate: on the top is one flower with long narrow Peach-coloured petals, which are reflexed backward; the middle or disk is very prominent, and of a dark purple colour, but the summits being of a gold colour, adds a lustre to the other. This sort may be treated in the same manner as the other; it flowers at the same season, but the flowers are not of so long duration as those of the former.

The third sort grows naturally in several parts of *North America*. This is a biennial plant, which in warm summers perfects its seeds in *England*; the lower leaves of this sort are divided into three lobes, but those upon the stalks are undivided; they are hairy, and shaped like those of the first sort; the stalks branch out on their sides, and are better garnished with leaves than either of the other. The flowers are very like those of the first sort, but smaller; the plants will live through the winter in the open air in mild seasons, and may be propagated by slips or heads; but the best way is to raise the plants from seeds, because those will flower much better than such as are procured by slips; the second year the seedling plants will flower, and produce ripe seeds.

The fourth sort grows naturally in most parts of *North America*, and has been long an inhabitant in *European* gardens, where it was generally known by the title of Sunflower. The root of this is perennial, but the stalk is annual; the lower leaves are composed of five broad lobes, which are deeply cut into acute points, some of them are jagged almost to the midrib; the outer lobe is frequently cut into three deep segments. The stalks rise seven or eight feet high, and divide upward into several branches; they are smooth, green, garnished with single leaves, which are oval,

ovate, heart shaped; some of these are indented on their edges, and others are entire. The foot-stalks which sustain the flowers are naked, and terminated by a single flower with yellow petals or rays, shaped like those of the Sun-flower, but smaller. This does not produce seeds here, but is easily propagated by parting of the roots, in the same manner as the perennial Sun-flower. It is very hardy in respect to cold, but loves a moist soil.

The fifth sort has a perennial root like the former, and is a native of the same country. This hath smooth green stalks, which rise higher than those of the former; the leaves are all composed of five lobes, which are much narrower, and end with sharper points than those of the former, which are very acutely indented on their sides. The flowers are smaller, and the petals narrower than those of the former sort, but appear at the same season. It is equally hardy with the former, and may be propagated in the same way.

The sixth sort grows naturally in *North America*, and also in *Siberia*, from both which countries I have received the seeds. This hath a perennial root like the two former; the leaves at bottom are composed of seven or nine lobes, some of which are entire, and others are jagged to the midrib; they are smooth, and of a dark green; the stalks rise six feet high, and divide into many branches. They are of a purple or iron colour, very smooth, garnished with leaves, which toward the bottom are hand-shaped, composed of five lobes, and the upper have but three; those at the top are single. The flowers are smaller than those of the two former sorts, but are of the same shape and colour.

The three last mentioned sorts may be propagated in plenty, by parting of their roots; the best time for this is in *October*, when their stalks will begin to decay; for if they are removed in the spring, they will not produce many flowers the same year. They love a moist soil, and should be allowed room, for if they are too near other plants, they will rob them of their nourishment. They are proper furniture for large gardens, where they may be allowed room, or in walks round fields, because they require little culture.

RUELLIA. *Plum. Nov. Gen. 12. tab. 2.*

The Characters are,

The flower has a permanent empalement cut into five narrow acute segments at the top, which are erect. It has one petal, with a tube the length of the cup, which inclines at the neck; the brim spreads open, and is cut into five segments, the two upper being large and reflexed. It hath four stamina situated in the tube, connected in pairs, terminated by short summits, and a roundish germen, supporting a slender style, crowned by a bifid stigma. The germen afterward becomes a taper capsule, pointed at each end, having two cells, inclosing roundish compressed seeds.

The Species are,

1. RUELLIA foliis ovatis crenatis, pedunculis bifloris. Ruellia with oval crenated leaves, and foot-stalks bearing two flowers.

2. RUELLIA foliis petiolatis, floribus verticillatis subsessilibus. *Hort. Upsal. 178.* Ruellia with leaves having foot-stalks, and flowers growing in whorls fitting close to the stalks.

3. RUELLIA foliis petiolatis, pedunculis longis subdivisis nudis. *Lin. Hort. Upsal. 179.* Ruellia with leaves having foot-stalks, and long naked foot-stalks to the flowers, which are divided.

4. RUELLIA foliis subcrenatis lanceolato-ovatis, capitulis ovatis, foliolis bipidis. *Lin. Sp. Plant. 635.* Ruellia with oval spear-shaped leaves, which are somewhat crenated, oval pods, and prickly, hairy, small leaves.

The first sort grows naturally in many of the islands in the *West-Indies*; the roots of this are composed of many swelling fleshy tubers, which are like those of the Day Lily,

but smaller. The stalk rises about four or five inches high, sending out two or three short side branches, garnished with leaves placed opposite; some of these are small and shaped like a spatula, others are much larger; they have short foot-stalks, and are a little crenated on their edges. The flowers are produced on the side, and at the end of the stalk; those on the side have two flowers upon each foot-stalk, which come out opposite, but those at the top sustain three. The flowers have narrow tubes about an inch long, spreading out to a sort of bell-shape; at the top they are cut into five obtuse segments, which are large, and spread open; they are of a fine blue, but of short duration, each flower seldom lasting in beauty one day; after the flower fades, the germen becomes a taper pod one inch and a half long, having two cells, which, when ripe, burst with a touch, and cast out the seeds to a distance.

The second sort grows naturally in *Carolina*; the root of this is fibrous and perennial; the stalks rise about a foot high; they are four-cornered, and have two longitudinal furrows; the joints are three or four inches asunder, at each stand two oval leaves upon very short foot-stalks. The flowers come out from the wings of the leaves, two or three rising from the same point, sitting very close to the stalks; they are small, and of a pale purple colour, but are very fugacious; they open early in the morning, but fade by ten or eleven o'clock in the forenoon; these are succeeded by short taper pods, surrounded by the hairy segments of the empalement.

The third sort grows naturally in the *West-Indies*. This hath a perennial root, composed of many fleshy fibres; the leaves lie close to the ground; the stalks grow five or six inches high, with leaves placed by pairs at each joint, standing upon foot-stalks. The foot-stalks which sustain the flowers are naked, and divide into two smaller, each sustaining one small purple flower, which is very fugacious; their empalements are cut into very narrow segments to the bottom. After the flowers are past, the germen becomes a taper capsule about an inch long, including roundish compressed seeds.

The fourth sort grows naturally in both *Indies*; I received the seeds of this from *Carthage* in *New Spain*. This hath a ligneous creeping root; the stalks are single, taper, and rise about five or six inches high; the leaves are oval, spear-shaped, and have very short foot-stalks; they are a little waved on their edges, are hairy, and curled. The flowers are produced from the side of the stalk, which are yellow, coming out between rough, hairy, small leaves. The seeds ripen in *September*.

These plants are propagated by seeds, which must be sown in the spring in pots, and plunged into a moderate hot-bed; when the plants come up, they must be transplanted each into a separate small pot, and plunged into a fresh hot-bed of tanners bark, and must be shaded from the sun, until they have taken new root; after which time, they must have free air admitted to them every day in warm weather. If the plants thrive well, those of the first and third sorts will produce flowers the *July* following, and will perfect their seeds in *August*; but the roots will continue, provided they are plunged into the bark-bed in the stove, and kept in a moderate temperature of heat.

The second sort is not a plant of long continuance, seldom abiding longer than two years; but if it is treated in the same manner as the two other, it will ripen seeds the second year, so may be propagated easily.

The fourth sort does not so constantly produce seeds as the three others, so is not so common in *England* at present. This requires the same treatment as the other sorts.

If the seeds of these plants are permitted to scatter in the neighbouring pots, the plants will come up without care,

fo may be transplanted into pots, and plunged into the tan-bed.

RUMEX. *Lin. Gen. Plant.* 407. Dock.

The Characters are,

The empalement of the flower is permanent. The flower has three petals, which are larger than the empalement, to which they are very like. It hath six short hair-like stamina, terminated by erect twin summits, and a three-cornered germen, supporting three hair-like reflexed styles, thrusting out of the clefts of the petals, crowned by large jagged stigmas. The germen afterward becomes a three-cornered seed, included in the petals of the flower.

The Species are,

1. RUMEX floribus hermaphroditis, valvulis integerrimis, foliis oblongo-lanceolatis. Dock with hermaphrodite flowers having entire valves, and oblong spear-shaped leaves; commonly called Patience Rhubarb.

2. RUMEX floribus hermaphroditis, valvulis integerrimis graniferis, foliis cordatis obtusis. Rumex with hermaphrodite flowers, having entire valves, bearing grains, and obtuse heart-shaped leaves; called Monks Rhubarb.

3. RUMEX floribus hermaphroditis pedicellatis, foliis lanceolatis longissimis. Rumex with hermaphrodite flowers growing upon small foot-stalks, and the longest spear-shaped leaves; or Water Dock.

4. RUMEX floribus hermaphroditis, valvulis dentatis graniferis, foliis cordato-oblongis. *Hort. Cliff.* 138. Rumex with hermaphrodite flowers, indented grain-bearing valves, and oblong heart-shaped leaves; or sharp-pointed Dock.

5. RUMEX floribus hermaphroditis, valvulis integris graniferis, foliis lanceolatis undulatis acutis. *Lin. Sp.* 335. Rumex with hermaphrodite flowers, entire grain-bearing valves, and acute, spear-shaped, waved leaves; or curled sharp-pointed Dock.

6. RUMEX floribus hermaphroditis, valvulis integerrimis, unica granifera foliis cordato-lanceolatis. *Hort. Cliff.* 138. Rumex with hermaphrodite flowers, entire valves, and heart-formed spear-shaped leaves; the bloody Dock.

7. RUMEX floribus hermaphroditis verticillatis, valvulis acutè dentatis, foliis lanceolatis. Rumex with hermaphrodite flowers growing in whorls, acutely-indented valves, and spear-shaped leaves; sharp-pointed Dock with a golden flower.

8. RUMEX floribus hermaphroditis, valvulis dentatis, foliis cordato-oblongis, obtusiusculis crenulatis. *Lin. Sp.* 335. Rumex with hermaphrodite flowers, indented valves, and blunt, oblong, heart-shaped leaves; common broad-leaved, or Butter Dock.

9. RUMEX floribus hermaphroditis, foliis lyris. *Guet. Stam.* 1. p. 7. Rumex with hermaphrodite flowers, and lyre-shaped leaves; the Fiddle Dock.

10. RUMEX floribus hermaphroditis, valvulis dentatis graniferis, foliis linearibus. *Lech. Scan.* 26. Rumex with hermaphrodite flowers, indented grain-bearing valves, and linear leaves.

11. RUMEX floribus hermaphroditis pedunculis longioribus, valvulis profunde dentatis, foliis cordato-oblongis. Rumex with hermaphrodite flowers growing upon longer foot-stalks, valves which are deeply indented, and oblong heart-shaped leaves; or Aleppo Dock.

12. RUMEX floribus hermaphroditis, valvulis trifido setaceis, unica granifera. *Hort. Upsal.* 89. Rumex with hermaphrodite flowers and bristly three-pointed valves; or annual Egyptian Dock.

13. RUMEX floribus hermaphroditis valvulis lævibus, caule arborco, foliis subcordatis. *Vir. Cliff.* 32. Rumex with hermaphrodite flowers, smooth valves, a tree like stalk, and leaves which are almost heart-shaped; Tree Sorrel.

14. RUMEX floribus hermaphroditis, valvulis nudis dentatis

planis reflexis. *Hort. Upsal.* 90. Rumex with hermaphrodite flowers, and plain, naked, indented, reflexed valves.

15. RUMEX floribus hermaphroditis geminatis, valvularum alis maximis membranaceis reflexis, foliis indivisis. *Hort. Cliff.* 130. Rumex with hermaphrodite flowers growing by pairs, very large membranaceous wings to the valves, which are reflexed, and undivided leaves.

16. RUMEX floribus hermaphroditis distinctis, valvularum alis maximis membranaceis, foliis erosis. *Flor. Leyd. Prod.* 230. Rumex with hermaphrodite flowers growing upon distinct spikes, very large membranaceous wings to the valves, and leaves appearing as if bitten.

The first sort was formerly much more cultivated in the English gardens than at present; the roots of this has been generally used for the Monks Rhubarb, and has been thought the true, but others suppose the second sort should be used as such. The root is large, and divides into many thick fibres; their outer cover is brown, but they are yellow within, with some reddish veins; the leaves are broad, long, and acute-pointed; their foot-stalks are of a reddish colour; the stalks rise six or seven feet high, and divide toward the top into several erect branches, garnished with a few narrow leaves, terminating with loose spikes of large staminate flowers. These appear in June, and are succeeded by pretty large three-cornered seeds, whose coverings are entire, which ripen in autumn.

The second sort grows naturally on the Alps, but has been long cultivated in the English gardens. This hath large roots, which spread and multiply by their offsets; they are shorter and thicker than those of the first sort, of a very dark brown on their outside, and yellow within. The leaves are of the round heart-shape, standing upon long foot-stalks. The stalks rise from two to three feet high; they are thick, and have a few small roundish leaves on the lower part, but the upper part is closely garnished with spikes of white flowers, standing erect close to the stalks. These appear the latter end of May, and are succeeded by large triangular seeds, which ripen in August.

The third sort grows naturally in ponds, ditches, and standing waters, in many parts of England; this is supposed to be the *Herba Britannica* of the ancients. It hath large roots, which strike deep into the loose mud, sending out leaves which are above two feet long, drawing to a point at each end. The stalks rise five or six feet high when the plants grow in water, but in dry land seldom more than three; these are garnished with narrow leaves among the spikes of flowers to the top. The flowers stand upon slender foot-stalks, which are reflexed; they are of an herbaceous colour, appear in June, and the seeds ripen in autumn.

The fourth sort grows naturally in moist places in many parts of England; this is the *Oxylapathum* of the shops, which is directed by the college to be used in medicine; but the markets are supplied with roots of the common Docks, which are indifferently gathered by those who collect them in the fields, where the eighth sort is much more common than this. The roots of this sort are slender and run downright, sending out a few small fibres; the stalks rise about two feet high, garnished at bottom with leaves four inches long, and one and a half broad in the middle; they are rounded at their base, where they are slightly indented, but end in acute points; they are plain, and slightly crenated on their edges. From the joints of the stalk come out alternately slender long foot-stalks, which sustain the spikes of flowers, which grow in small whorls round the stalks, at about an inch distant; these have scarce any leaves upon the foot-stalks between the whorls of flowers, so may be easily distinguished from the small Water Dock, which has many.

The fifth sort is more commonly found growing naturally about *London* than the fourth; the leaves of this are much longer than those of the former, and are indented on their sides, which are also waved; the stalks rise about the same height as those of the former. The spikes of flowers from their side are shorter, and closer garnished with flowers on pretty long foot-stalks; the covering of the seed is entire.

The sixth sort is very like the fourth in appearance, but the leaves have deep blood-coloured veins, and some small spots of the same on their surface; the stalks are red, and rise about the same height as the fourth; but the covering of the seed is entire, whereas those of the fourth are indented, so may be readily distinguished. It grows naturally in many parts of *England*.

The seventh sort grows naturally in several parts of *England*; this is a biennial plant, which perishes soon after the seeds are ripe; the stalks rise near two feet high; they are of a deep purple colour, garnished with spear-shaped leaves toward the bottom, which are four inches long, and almost one broad in the middle, but those on the upper part of the stalk are very narrow, and not more than two inches long; the spikes of flower come out from the sides of the stalks alternately. The flowers grow in thick whorls, which sit close to the stalks; these are of a bright yellow, and the covers of the seeds are sharply indented.

The eighth sort is the most common Dock by the sides of roads and banks in every part of *England*; the leaves of this sort are broad and rounded at their points, though some of them end more acutely than others; they are near a foot long, and five inches broad toward their base, having many transverse veins running from the midrib to their borders. The stalks rise from two to three feet high, branching out on their sides, having a few leaves on their lower part, of the same shape with the other, but smaller. The flowers grow in whorls, sitting very close to the stalks; some plants have indented coverings to their seed, and others have entire coverings; both these are frequently found intermixed, so that I doubt of their being distinct species. The leaves of this Dock were formerly much used for wrapping up of butter, and from thence the plant was called Butter Dock.

The ninth sort grows naturally in many places near *London*; this is a biennial plant, which perishes soon after the seeds are ripe. The stalks of this rise about a foot high, and branch out from the bottom; the leaves grow near the root; they are about two inches and a half long, and are hollowed on their sides, so as to resemble the sides of a fiddle; the stalks are generally bent at their joints. The flowers grow in whorls round the stalks, to which they fit very close; they are hermaphrodite; the covers of the seeds are sharply indented.

The tenth sort is sometimes found growing naturally in *England*, upon places where the water has stood in winter. This seldom rises more than five or six inches high, but divides into two or three branches; the leaves are about three inches long, and a quarter of an inch broad, smooth, and stand upon short foot-stalks. The flowers grow in whorls round the branches, to which they fit very close; these are succeeded by small triangular seeds, having indented covers.

The eleventh sort came originally from *Aleppo*; this is a biennial plant; the leaves are nine or ten inches long, smooth, of a light green, and three inches broad at their base, where they are indented, and end in acute points. The stalks rise from two to three feet high, sending out many branches from their sides, garnished with large whorls of herbaceous flowers, standing upon pretty long foot-stalks; these are succeeded by three-cornered seeds, whose coverings are deeply indented.

The twelfth sort grows naturally in *Egypt*; this is an an-

nual plant; the stalk rises about ten inches high, sending out a few horizontal branches toward the bottom; the leaves are about two inches long, and half an inch broad at the broadest part. The flowers grow in whorls round the stalks; they are very small, and the hair-like beards, which adhere to the covering of the seed, being long, obscure the flowers, so they are scarce visible to the naked eye.

All these sorts of Docks rise easily from seeds, and, if introduced into a garden, will become troublesome weeds, if their seeds are permitted to scatter; therefore few persons care to propagate any of them, except the two first sorts, which are cultivated for their use in medicine. The seeds of all the Docks should be sown in autumn soon after they are ripe, for those seeds which are sown in the spring, rarely grow the same year: when the plants come up, they will require no other care but to thin them where they are too close, and keep them clean from weeds. They all delight in a moist rich soil.

The thirteenth sort is commonly known among the gardeners, by the title of Sorrel-tree. This came originally from the *Fortunate*, or *Canary Islands*, but has been long an inhabitant in some *English* gardens; it rises with a ligneous stalk ten or twelve feet high, covered with a smooth brown bark, sending out many slender branches, garnished with smooth, roundish, heart-shaped leaves, standing alternately upon pretty long foot-stalks. The flowers come out in loose panicles toward the end of the branches; they are of an herbaceous colour, and are sometimes succeeded by triangular seeds with smooth covers, but they rarely ripen in *England*. This plant is easily propagated by cuttings, which may be planted in any of the summer months, in a bed of loamy earth, and shaded from the sun until they have taken pretty good root; then they should be taken up, and planted in pots, placing them in the shade till they have taken new root; after which they may be removed to a sheltered situation, among other hardy greenhouse plants, till autumn, when they must be removed into the greenhouse, and treated in the same way as other hardy kind of plants, which only want protection from frost.

The fourteenth sort is a low annual plant, which grows naturally in *Italy* and *Spain*. This is generally found on swampy moist ground; the stalks are slender, branching at the bottom, and rise about four inches high; the lower part is garnished with small, oval, succulent lobes; their upper part is furnished with small herbaceous flowers growing in whorls, and have no leaves between them; they are succeeded by small seeds, whose covers are sharply indented and reflexed. These appear in *June*, and the seeds ripen in *August*, which, if permitted to scatter, will furnish a supply of young plants the following spring; or if the seeds are then sown, the plants will come up the following spring, and require no other care but to thin them, and keep them clean from weeds.

The fifteenth sort is an annual plant; this hath pretty thick succulent stalks, which rise a foot high, and divide into many branches; the leaves are of the round heart-shaped and undivided, having very long foot-stalks. The flowers grow in loose spikes at the end of the branches; these are succeeded by large covers to the seeds, which are inflated, and have broad membranaceous borders; the seeds are triangular, and ripen in autumn.

The sixteenth sort grows naturally in *Egypt*. This is also an annual plant, whose stalks rise a foot and a half high, dividing upward into several branches; the stalks are garnished with arrow-pointed leaves about three inches long, whose sides are irregularly torn, as if they had been gnawed by insects; they stand upon pretty long foot-stalks, and have smooth surfaces; the flowers are disposed in loose spikes; some spikes have only male flowers, and others

have all hermaphrodite flowers, and some plants have only male, and others hermaphrodite flowers. The latter are succeeded by triangular seeds, inclosed in large inflated covers, of a deep red colour, having membranaceous borders. The seeds of this ripen in autumn.

The seeds of both these sorts grow very freely, if sown in a bed of light earth in the spring, where the plants are designed to remain. When they come up, they will require no other care, but to keep them clean from weeds, and thin them where they are too close.

RUSCUS. *Tourn. Inst. R. H. 79. tab. 15.* Knee-holly, or Butchers broom.

The Characters are,

It hath male and female flowers in distinct plants; the male flowers have erect spreading empalements, composed of six oval convex leaves, whose borders are reflexed; they have no petals, but an oval nectarium the size of the empalement, which is erect and inflated, opening at the mouth; they have no stamina, but each has three spreading summits, sitting on the top of the nectarium, which are joined at their base. The female flowers have empalements, but no petals, and nectariums like the male; they have no stamina, but have an oblong oval germen hid within the nectarium, supporting a cylindrical style, crowned by an obtuse stigma, standing above the mouth of the nectarium. The germen afterward becomes a globular berry with two or three cells, inclosing two globular seeds.

The Species are,

1. *Ruscus foliis supra floriferis nudis. Hort. Cliff. 465.* Ruscus with leaves which bear flowers on their upper side, and are naked; Knee-holly, or Butchers-broom.

2. *Ruscus foliis subtus floriferis nudis. Hort. Cliff. 465.* Ruscus with leaves which bear flowers beneath, and are naked.

3. *Ruscus foliis subtus floriferis sub foliolo. Hort. Cliff. 465.* Ruscus with flowers under the leaves.

4. *Ruscus racemo terminali hermaphroditico. Hort. Cliff. 469.* Ruscus with hermaphrodite flowers in long bunches, terminating the stalks.

5. *Ruscus foliis ternis ovatis acuminatis, supra floriferis nudis.* Ruscus with oval acute-pointed leaves, which are placed by threes, and flowers on their upper side.

6. *Ruscus foliis ovatis acuminatis, supra floriferis nudis, caulibus flexuosis.* Ruscus with acute-pointed leaves, bearing flowers on their upper side, and flexible stalks.

7. *Ruscus foliis margine floriferis. Hort. Cliff. 464.* Ruscus with flowers growing on the borders of the leaves.

8. *Ruscus caule fruticoso ramoso, foliis lanceolatis rigidis, floribus pedunculatis terminalibus.* Ruscus with a shrubby branching stalk, spear-shaped stiff leaves, and flowers growing upon foot-stalks, terminating the branches.

The first sort is very common in the woods in divers parts of England, and is rarely cultivated in gardens. The roots of this kind are sometimes used in medicine, and the green shoots are cut, bound into bundles, and sold to the butchers, who use it as besoms to sweep their blocks, from whence it had the name of Butchers-broom. It is also called by some Knee-holly.

This hath roots composed of many thick fibres, which twine about each other, from which arise several stiff green stalks about three feet high, sending out from their side several short branches, garnished with stiff, oval, heart-shaped leaves, placed alternately on every part of the stalk, ending with sharp prickly points. The flowers are produced in the middle on the upper side of the leaves; these are male in some, and female in other plants; they are small, and cut into six parts, of a purple colour, sitting close to the midrib; they appear in June, and the female flowers are succeeded by berries, almost as large as Cherries, of a sweetish taste, which ripen in winter, when they are of a beautiful red colour.

As this plant grows wild in most parts of England, it is rarely admitted into gardens, but, if some of the roots are planted under tall trees in large plantations, they will spread into large clumps, and, as they retain their leaves in winters, at that season they will have a good effect. The seeds of this plant generally lie a year in the ground before they vegetate, and the plants so raised are long before they arrive to a size big enough to make any figure, so it is not worth while to propagate them that way, especially as the roots may be easily transplanted from the woods. The roots and seeds of this plant have been used in medicine; the young shoots of this plant in the spring, are sometimes gathered and eaten by the poor like those of Asparagus; the branches of this plant, with their ripe fruit upon them, are frequently cut, and put into basons, mixing them with the stalks of ripe seeds of male Piony, and those of the wild Iris or Gladwyn, which together make a pretty appearance in rooms, at a season of the year when there are few flowers, and these will continue a long time in beauty.

The second sort grows naturally in the mountainous parts of Italy, but is preserved for the sake of variety in many English gardens. The roots of this have large knotty heads with long thick fibres like those of the former sort, from which arise many tough limber stalks near two feet high, garnished by stiff, oblong, oval leaves, ending in points, placed alternately on the stalks. The flowers are produced on the under surface of the leaves near the middle, sitting close to the midrib; they are small, of an herbaceous white colour; the female flowers are succeeded by small red berries, about the size of those of Juniper.

It stands in most dispensaries among the plants used in medicine, and has been commended for opening obstructions in the kidneys, and to provoke urine.

The third sort grows naturally upon shady mountains in Italy, Hungary, and other parts of Europe. The root of this is composed of many thick fibres like those of the former, from which arise many tough limber stalks, which are about ten inches high, garnished with spear-shaped leaves, having several longitudinal veins, placed for the most part alternate, but sometimes they are opposite. On the middle of the upper surface of these comes forth a small leaf of the same shape, and at the same point, from the bosom of the small leaves, come out the flowers, which are of a pale yellow colour. The female flowers are sometimes succeeded by berries almost as large as those of the first sort, which are red, and ripen in winter. This is sometimes called Bilingua, or double Tongue, from the leaves growing one out of another. It stands in dispensaries as a medicinal plant, but is rarely now used.

The fourth sort grows naturally in the Archipelago, but is frequently planted in the English gardens; it is called Laurus Alexandrina, i. e. Alexandrian Bay, and is supposed to be the plant with which the ancients crowned their victors and poets. The stalks of this being very pliable, may be easily wrought into coronets for this purpose; and the leaves of this plant having a great resemblance to those which are represented on the ancient busts, seem to confirm this opinion.

The roots of this are like those of the former species; the stalks are slender and much more pliable; they rise about four feet high, and send out many side branches, garnished with oblong acute-pointed leaves, rounded at their base, of a lucid green, placed alternately, sitting close to the branches. The flowers are produced in bunches at the end of the branches, which are hermaphrodite, of an herbaceous yellow colour, and are succeeded by berries like those of the first sort, which ripen in winter.

The fifth sort grows naturally in *Zant* and some of the other islands in the *Morea*. The roots of this are like those of the former sorts; the stalks rise about two feet high; they are slender, pliable, and garnished with oval leaves, placed by threes round the stalk, rounded at both ends, terminating in acute points. The flowers grow on the under side of the leaves, fastened to the midrib; they are naked, and have pretty long foot-stalks; the segments or petals are very narrow; the fruit I have not seen, so can give no account of it.

The sixth sort grows naturally in *Italy*, where it was discovered by Signior *Micheli* of *Florence*. The roots of this are much longer than those of the first sort; the stalks rise near five feet high, are very pliant, and send out several side branches, garnished with stiff oval leaves, ending in acute points. The flowers are produced on the upper surface of the leaves, sitting close to the midrib; they are small, of an herbaceous white colour, and are succeeded by berries, which are smaller than those of the first sort, of a pale red when ripe.

All these sorts are very hardy, and will thrive in almost any soil or situation, so are very proper for planting round the verges of close woods, or under large trees in wilderness quarters, for, as they are always green, they make a good appearance in winter, after the deciduous trees have cast their leaves; they are easily propagated by parting of their roots. The best time for this is in autumn, but, when this is performed, the roots should not be divided into small parts, because that will weaken them so much, that they will make but little figure, until they have had two or three years growth; they may also be propagated by sowing of their seeds; but this is a very tedious method, so is seldom practised.

The seventh sort sends out pliant stalks, which rise seven or eight feet high, and have several short branches proceeding from their sides, which are garnished with stiff leaves, rounded at the foot-stalk, ending in acute points. The flowers are produced in clusters on the edges of the leaves, which are white, and are succeeded by berries of a yellowish red colour, not so large as those of the first sort.

This sort is tender, and must therefore be planted in pots, and in winter removed into the green-house; but it should be placed where it may have free air in mild weather, for it only requires to be screened from frost; in the summer it must be set abroad with other hardy green-house plants. With this management the plants will send forth stems six or eight feet high, furnished with leaves from bottom to top, and will be closely set with flowers upon their edges, which make a very beautiful and odd appearance. This is also propagated by parting the roots, as the former, which should not be done very often, because, if the roots are not permitted to remain some time to get strength, they will produce but weak shoots, and very few flowers. This sort grows plentifully at *Madeira*, from whence the seeds may be procured; but they commonly remain in the ground a year before the plants come up, so should be sown in pots, and placed under a hot-bed frame in winter, to screen the seeds from the frost, and the following spring the plants will appear.

The eighth sort was discovered by the late Dr. *Houfston* growing naturally at *Carthage* in *New Spain*; this rises with shrubby stalks eight or ten feet high, which divide into many branches, garnished with stiff spear-shaped leaves, sometimes ranged in whorls round the stalks, and at others they are opposite. The flowers are produced in loose bunches at the end of the branches, standing upon slender foot-stalks; they are small, of a red colour, and shaped like those of the first sort.

This plant is tender, so must be kept in a stove during the winter, otherwise it will not live in *England*.

RUTA. *Tourn. Inst. R. H. 257. tab. 133. Rue.*

The Characters are,

The flower has a permanent empalement cut into five parts; it has four or five oval petals, which are narrow at their base, and eight or ten awl-shaped spreading stamina, the length of the petals, crowned by erect summits, with a gibbous germen having a cross furrow, supporting an erect awl-shaped style, crowned by a single stigma. The germen afterward becomes a gibbous capsule with five lobes, and five cells opening in five parts at the top, filled with rough angular seeds.

The Species are,

1. RUTA foliis decompositis, floribus octandris, staminibus corollâ longioribus. Rue with decomposed leaves, and flowers having eight stamina, which are longer than the petals; or broad-leaved Garden Rue.

2. RUTA foliis decompositis, foliolis oblongo-ovatis, staminibus corolla æquantibus. Rue with decomposed leaves, the small leaves oblong, oval, and stamina equalling the petals.

3. RUTA foliis inferioribus decompositis, foliolis linearibus, summis quinquesidis trifidisque. Rue with decomposed linear leaves below, and the upper ones five or three-pointed; or smaller wild Rue.

4. RUTA foliis decompositis, floribus decandris, marginibus petalorum ciliatis. Rue with decomposed leaves, flowers having ten stamina, and the borders of the petals of the flower hairy; or broad-leaved Aleppo Rue.

5. RUTA foliis compositis, floribus decandris, petalis florum ciliatis. Rue with compound leaves, flowers having ten stamina, and hairy petals to the flower; or narrow-leaved Aleppo Rue.

6. RUTA foliis simplicibus indivisis. *Lin. Sp. Plant. 384.* Rue with single undivided leaves.

7. RUTA caule erecto corymbose, foliis compositis, floribus decandris, staminibus corollâ longioribus. Rue with an erect corymbus stalk, compound leaves, and flowers having ten stamina, which are longer than the petals.

The first sort is the common Rue, which has been long cultivated in the gardens, and is that which is directed to be used in medicine, but of late years the second sort has so generally prevailed, as almost to supplant the first, in the gardens about *London*, that being harder than the first, is not so liable to be killed by severe frost.

This rises with a shrubby stalk to the height of five or six feet, sending out branches on every side, garnished with decomposed leaves, whose small leaves (or lobes) are wedge-shaped, of a gray colour, and have a strong odour. The flowers are produced at the end of the branches, in bunches almost in form of umbels; they are composed of four yellow concave petals, which are cut on their edges, and eight yellow stamina, which are longer than the petals, terminated by roundish summits. The germen becomes a roundish capsule, with four lobes punched full of holes, containing rough black seeds.

The second sort hath a shrubby stalk, which rises three or four feet high, sending out many branches, garnished with decomposed leaves, narrower than those of the former sort, of a bluish gray colour, and have a strong odour. The flowers grow in longer and looser bunches than the former; they have four short, concave, yellow petals, and eight short stamina of equal length with the petals. The seed-vessel is like that of the former, but smaller.

The third sort grows naturally in *Spain*. The lower leaves of this are compounded of several parts, which are joined to the midrib in the same manner as the branching winged leaves, garnished with small linear leaves, standing without order. The stalks rise from two to three feet high, branching out from the bottom, and are garnished with leaves, divided into five parts, those at the top into three, which are

are as small and narrow as those at the bottom, of a gray colour, but not so stinking as those of the other. The flowers grow at the end of the branches in loose spikes, which are generally reflexed; the petals of the flower are yellow; these are succeeded by small seed-vessels, filled with angular black seeds.

The seeds of the fourth sort came first from *Aleppo*, but has been brought from the *Cape of Good Hope*. This hath strong shrubby stalks, which rise three feet high, dividing into many branches, garnished with decomposed leaves, larger than those of the common sort, and have a stronger odour. The flowers are disposed almost in form of an umbel at the end of the branches; they have five concave yellow petals, whose borders are set with fine hairs, and ten stamina, which are of equal length with the petals. The seed-vessels of this are much larger than those of the common sort.

The fifth sort grows naturally at *Aleppo*. This hath shrubby stalks which are smaller, and do not rise so high as those of the former sort. The leaves are much narrower and grayer than those, but have the same strong odour; the flowers are smaller, having five petals, which are pretty close set with small hairs; they have ten thick stamina, five of which are alternately longer than the petals; the seed-vessels are like those of the first sort.

The sixth sort grows naturally in *Spain*. This rises with several single stalks from the root near a foot and a half high, garnished with single narrow leaves, of a yellowish green colour, placed alternately on the stalks, to which they fit very close; at the base of these come out one or two very small leaves, of the same shape and colour. The flowers grow in small clusters at the end of the stalks; they have each five oblong yellow petals, and ten stamina of equal length, terminated by awl-shaped summits.

The seventh sort rises with an erect stalk two feet high, garnished with compound leaves, whose smaller leaves are narrow, obtuse, of a grayish colour, but have not so strong an odour as the former. The upper part of the stalk divides in form of a corymbus, sustaining upon naked foot-stalks small bunches of yellow flowers, which have five concave petals, and ten stamina, which are much longer than the petals, terminated by roundish summits.

All these plants may be propagated either by sowing of their seeds, or by planting slips or cuttings, both of which must be done in the spring. The manner of propagating them from cuttings, being the same as for Lavender, *Stœchas*, and other hardy aromatick plants, need not be here repeated; if they are propagated by seeds, there needs no farther care but to dig a bed of fresh earth in the spring, making it level, then to sow the seed thereon, and rake the ground smooth; after which you must observe to keep the bed clear from weeds until the plants come up about two inches high, when they should be transplanted out into fresh beds, where they may remain for use. All these plants must have a dry soil, otherwise they are very subject to be destroyed in winter. The two *Aleppo* Rues, and the wild Rue, are somewhat tenderer than the common sort, but these will endure our ordinary winters very well in the open air, especially if they are planted on a dry soil.

The sixth and seventh sorts are tenderer than either of the other, and of shorter duration. The seeds of the seventh sort were sent me from *Gibraltar Hill*, where the plant grows naturally. This doth not ripen its seeds here, unless the summers are warm, and, in hard winters, the plants are generally killed, unless they are removed into shelter.

The sixth sort will live through the winter in the open air, provided it is planted in a poor dry soil, and the second year it will perfect seeds; but, as it is of short duration,

young plants should be annually raised to succeed the others.

All the sorts of Rue will live much longer, and are less liable to be injured by frost in winter, when they grow in a poor dry rubbishy soil, than in good ground, for in rich moist land the plants grow very vigorously in summer, and are so replete with moisture, that a small frost will kill their tender shoots; whereas in poor dry ground, their growth will not be great, but their shoots will be hard and compact, so more able to resist the cold.

RUTA CANINA. See Scrophularia.

RUTA MURARIA, Wall-rue, or white Maiden-hair.

This plant is found growing out of the joints of old walls in divers parts of *England*, where it is gathered for medicinal use, but, as it cannot be cultivated in gardens, so as to grow to advantage, I shall not say any thing more of it in this place.

RUYSCHIANA. Boerb. Ind. alt. 1. p. 172.

The Characters are,

The flower hath a permanent tubulous empalement, cut into five segments at the top, the upper one being broader and blunter than the other; it is of the lip kind, having a tube longer than the empalement. The chaps are large and swelling; the upper lip is erect, arched, and gently indented at the top; the lower lip is trifid; the two side segments are narrow, and stand erect; the middle is broad, reflexed, and indented at the point. It hath four stamina, two of which are long, situated under the upper lip; the other two are shorter, and situated just below them; they are terminated by oblong summits, fastened in the middle; it has four germen, situated at the bottom of the empalement, supporting a slender style the length of the stamina, crowned by a bifid reflexed stigma. The germen afterward becomes four oblong seeds, which ripen in the empalement.

The Species are,

1. RUYSCHIANA floribus spicatis, foliis bracteisque linearibus glabris indivisis. Ruyschiana with spiked flowers, linear leaves, and bractææ, which are smooth and undivided.

2. RUYSCHIANA floribus spicatis, foliis linearibus trifidis hirsutis. Ruyschiana with spiked flowers, and hairy, linear, three-pointed leaves.

3. RUYSCHIANA floribus axillaribus, foliis lanceolatis dentatis glabris. Ruyschiana with flowers growing at the wings of the stalks, and smooth, indented, spear-shaped leaves.

The first sort grows naturally in *Austria* and *Hungary*. This hath a perennial root, and an annual four-cornered stalk, which rises about two feet high, garnished with two smooth linear leaves. At each joint of the stalk come out two or three very narrow small leaves, of the same shape. The flowers are produced in whorled spikes at the top of the stalks, having small narrow leaves under each whorl. They have tubulous empalements cut into five segments at the top, four of which are narrow, and end in acute points; the other, which is on the upper side of the flower, is broader, and rounded at the point. The tube of the flower is longer than the empalement, is swelling, and large at the chaps; the upper lip is broad, erect, and arched over the tube; the lower lip is shorter, having two short side segments, which are erect; the middle segment is broad, rounded, indented at the point, and is reflexed back to the tube. It has four stamina, which lie close under the upper lip, arched in the same manner; two of these are as long as the style, which stands in the same position; the other two are shorter, and are situated just below the other; they are terminated by oblong summits, fastened in the middle to the stamina. The style is crowned by a bifid, reflexed, narrow stigma; the flowers appear in *June*, are of a fine blue colour, and are succeeded by four oblong seeds, which ripen in the empalement.

The second sort grows naturally in *Siberia*; this hath a perennial root. The stalks are four-cornered, hairy, rising a foot and a half high, garnished with hairy linear leaves, cut into three parts; the flowers grow in short whorled spikes at the end of the stalk, having some very narrow leaves under each whorl; the tube of the flower is longer, more equal in size than that of the former, and the middle segment of the lower lip is not so much reflexed. In other respects, the flowers are the same.

The third sort grows naturally in *Tartary*; this hath a perennial root; the stalks do not grow erect like the first, but spread nearer to an horizontal position; they have two large leaves opposite at each joint, and four smaller, two on each side between the larger; they are smooth, have sharp indentures on their edges, and stand erect. The flowers come out from the side of the stalks at the base of the leaves, two or three standing together on each side the stalk; their empalements are purple, cut into five acute segments at the top, the upper lip having three broad, and the lower two narrower. The flowers are of a paler blue than those of the first sort.

These plants are propagated by seed, which should be sown the latter end of *March*, in a bed of light earth in an open exposure; in five or six weeks after the plants will appear, when they should be carefully cleared from weeds. When the plants are about two inches high, they should be transplanted into a bed or border of light undunged earth,

observing to shade them from the sun until they have taken root; after which time they will require no farther care, but to keep them constantly clear from weeds till *Michaelmas*, when they should be removed into the places where they are designed to remain for good.

When the plants are first transplanted into the nursery-bed, they should be placed about six inches asunder every way, which will be sufficient room for them to grow the first season; this will admit of the hoe to come between the plants to destroy the weeds, which is by much a better method than pulling out the weeds by hand, and is much sooner performed. For as the hoe stirs the ground between the plants, it not only cuts down the weeds which were up and visible, but also destroys all those whose seeds were sprouted, and would have soon after appeared; so that one hoeing, if well performed, in dry weather, will more effectually destroy the weeds than two hand-weedings would do; besides, the stirring the ground is of great service to the plants.

At *Michaelmas*, when the plants are transplanted for good, they should be carefully taken up with balls of earth to their roots, and planted in the middle of the borders, intermixing them with other hardy plants of the same growth, in the pleasure-garden, where they will make a pretty appearance when they are in flower.

As these plants do not continue many years, it will be proper to raise a supply of young ones to succeed them.

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SABINA. See Juniperus.

SACCHARUM. *Lin. Gen. Plant.* 68. The Sugar-cane.

The Characters are,

It hath no empalement, but a woolly down longer than the flower incloses it. The flower is bivalve; the valves are acute-pointed, concave, and chaffy. It has three hair-like stamina the length of the valves, terminated by oblong summits, and an awl-shaped germen, supporting two rough styles, crowned by single stigmas. The germen afterward becomes an oblong acute-pointed seed, invested by the valves.

We have but one Species of this genus, viz.

SACCHARUM *floribus paniculatis*. *Hort. Cliff.* 26. Sugar-cane with flowers growing in panicles.

This plant grows naturally in both *Indies*, where it is cultivated for its juice, which, when boiled, affords that sweet salt which is called Sugar.

The Canes were formerly cultivated in the south of *France* for the same purpose, but it was in small quantities only, for in sharp winters they were killed, unless they were covered, so they had only the summer for their growth, which was too short for their getting sufficient strength to produce Sugar enough to answer the expence, so the planting of these Canes there has been long discontinued; they were also planted in several parts of *Spain*, before they were introduced to *France*, and are at present cultivated in plenty in *Andalusia*, from whence great quantities of Sugar are

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annually sent to *Madrid*, but there are few now planted in the other parts of *Spain*.

The root of this plant is jointed, like those of the other sorts of Cane or Reeds, from which arise four, five, or more shoots in number, proportionable to the age or strength of the root. These rise eight or ten feet high, according to the goodness of the ground in which they grow; for in some moist rich soils there have been Canes measured, which were near twenty feet long; but these were not near so good as those of middling growth, as they abounded with juice, which had but a small quantity of the essential salt in it, so that the expence of fuel and trouble of boiling, was more than the Sugar would defray. The Canes are jointed; the joints are more or less distant from each other, in proportion to the soil. The leaves are placed at each joint; the base or lower part of the leaf embraces the Cane to the next joint above its insertion, before it expands; they are three or four feet long from the joint where they unfold to their point, according to the vigour of the plant, and have a deep whitish furrow, or hollowed midrib, which is broad, prominent on the under side; the edges of the leaves are thin, and armed with small sharp teeth, which are scarce to be discerned by the naked eye, but will cut the skin of a tender hand, if it be drawn along it. The flowers are produced in panicles at the top of the stalks, composed of many spikes, which are nine or ten inches long, and are again subdivided into smaller spikes; these have long down which

which inclose the flowers, so as to hide them from sight; afterward the germen becomes an oblong-pointed seed, which ripens in the valves of the flower.

This plant is preserved by way of curiosity in several gardens in *England*, but being too tender to thrive here unless it is preserved in a warm stove, it cannot be brought to any great perfection. I have seen some of the plants growing, which were seven or eight feet high, and at the bottom as large as a common walking cane, but they have not produced their panicles of flowers here.

It is here propagated by slips taken from the sides of the older plants; those which grow near the root, and have fibres to them, will most certainly grow; so that when the shoots are produced at some distance from the ground, the earth should be raised about them, that they may put out fibres before they are separated from the mother plant. These slips should be planted in pots, and plunged into a moderate hot-bed of tanners bark; then they must be treated in the same way as other tender plants from the same countries, keeping them constantly plunged in the tan-bed in the stove, and as their roots increase in size, the plants should from time to time be shifted into larger pots; but this must be done with caution, for if they are over-potted, they will not thrive: they will require to have water frequently in warm weather, but it must not be given them in too great plenty, especially in cold weather. As the leaves of the plants decay, they should be cleared from about the stalks, for if these are left to dry upon them, it will greatly retard their growth. The stove in which this plant is placed, should be kept in winter to the same temperature of heat as for the Pine-apple, and in hot weather there should be plenty of free air admitted to the plants, otherwise they will not thrive.

I shall here subjoin some account of the method of propagating and cultivating the Sugar-cane in *America*, with some observations and experiments which have been made by a few curious persons in the *British Islands*, and shall propose some farther trials to be there made, in the culture and management of this useful plant, which are founded upon the experience I have had in the culture of some plants, which are similar in their growth with the Sugar-cane.

The land which is most proper for the growth of Sugar-canes, is such as hath a sufficient depth of soil, and is not too moist and strong, but rather light and easy to work; for although strong moist ground will produce much taller and bigger Canes than the other, yet the quantity of Sugar will be much less, not near so good, and will require a greater quantity of fuel, and a longer time to boil, before the Sugar can be made; which is also the case with all fresh land, where there has not been any Canes growing before; therefore many of the most expert planters burn their land when it is first cleared for planting of Canes, to abate its fertility; but if when land is first cleared of the wood, and the roots of bad weeds, it is sown with Indigo, which such fresh ground will produce much better than the old, or such as has been long cultivated, there may be two or three crops of this taken, which will prepare the land for the Sugar-canes, without being at the trouble of burning it; but the growing of Indigo has been so little practised in the *British Islands of America* for many years past, as to be esteemed unworthy the notice of a Sugar-planter; whereas, if they would sometimes change their crops to other species, they would soon find an advantage in the growth of their Canes; but the usual practice is to continue the Canes always upon the same land as long as it will produce them, without changing the species, or allowing the ground a fallow to rest and recover itself. By this method there are some plantations so much exhausted, as that the crop of Sugar will scarce defray the expence of culture.

Another thing should always be observed in the planting of fresh land with Canes, which is to allow them much more room than is generally done; for as the ground is strong, so there will a greater number of shoots come out from each plant, and not having room to spread at bottom, they will draw each other up to a great height, and be full of watery juice, the sun and external air being excluded from the Canes by the multiplicity of leaves, both which are absolutely necessary to ripen and prepare the salts during the growth of the Canes.

If the ground is proper for the Sugar-canes, and they are planted at a good distance from each other, the same plantation may be continued above twenty years without replanting, and produce good crops the whole time; whereas in the common method, they are generally replanted in six or seven, and in some of the poor land they are continued but two or three.

The Canes are in those warm countries propagated by cuttings or joints of proper lengths; these are from fifteen to twenty inches long, in proportion to the nearness of their joints or eyes. These cuttings are generally taken from the tops of the Canes, just below the leaves, but if they were chosen from the lower part, where they are less succulent and better ripened, they would not produce so luxuriant Canes, but their juice would be less crude, and contain a greater quantity of salts, which will be obtained by less boiling than those which are planted in the common way: this is well known to the judicious to hold true, in most kinds of vegetables, for it is by thus carefully propagating all kinds of esculent plants, either in the choice of the best seeds or cuttings, that most of the kinds have been so greatly improved of late years.

The distance which the planters usually allow to their Canes, is from three to four feet, row from row, and the hills are about two feet asunder in the rows; in each of these hills they plant from four to seven or eight cuttings, which is a very great fault, and is the cause of most of their blights so much complained of lately; for if all these grow, which is frequently the case, they rob each other of their nourishment; and if a dry season happens before they have acquired strength, they are very soon stunted in their growth, so are attacked by insects, which spread and multiply so greatly, as to cover a whole plantation in a little time; when this happens, the Canes are seldom good after, therefore it would be the better way to root them entirely up, when they are so greatly injured, for they very rarely recover this perfectly; for although the insects are not the cause of the disease, yet they confirm it, and cause it to spread.

Therefore, if instead of planting so many, there was but one good cutting planted in each hill, or to prevent miscarriage, two at most; and if both succeeded, the weakest were drawn out soon after they had taken, it will be found of great service to prevent these blights; and although the number of Canes will not be near so great from the same space of ground, yet the quantity of Sugar will be full as much, and will require little more than a fourth part of fuel to boil it.

I have been assured by two of the most sensible and judicious planters of Sugar in *America*, that they have made some experiments of the horse-hoeing culture for their Canes, which answered much beyond their expectations; one of those gentlemen told me, he planted one acre in the middle of a large piece of Canes, in rows at five feet asunder, and the hills were two feet and a half distant, and but one cutting to each hill. The ground between the rows was from time to time stirred with the horse-plough, to destroy the weeds and earth the plants; with this culture the Canes were double the size of those in the same piece,

which were cultivated in the usual way; and when the Canes were cut, those which had been thus planted and managed, were ground and boiled separately; the produce of Sugar was full as great as the best acre in the same piece, and the expence of boiling was little more than a sixth part of the other, and he sold the Sugar for six shillings *per* hundred weight more than he could get for the other.

The time for planting the Canes is always in the rainy seasons, and the sooner they are planted after the rains have began to fall, the more time they will have to get strength before the dry weather sits in; for when they have put out good roots, and are well established in the ground, they will not be so liable to suffer by the drought, as those which have but newly taken root.

The season being come for planting, the ground should be marked out by a line, that the rows of Canes may be strait, and at equal distances; but first it will be proper to divide the piece into lands of sixty or seventy feet broad, leaving intervals between each of about twenty feet; these will be found of great use when the Canes are cut, for roads in which the carriages may pass to carry off the Canes to the mill; for where there is not such provision made, the carriages are obliged to pass over the heads of the Canes, to their no small prejudice: besides, by these intervals, the sun and air will have freer passage between the Canes, whereby they will be better ripened, and their juice will be fuller of salts. The middle of these intervals may be planted with Yams, Potatoes, or other esculent plants, which may be taken off before the Canes are cut, that the passage may be clear for the carriages; but a path should be left on the sides of each land, for the more convenient riding or walking of the overseer of the plantation, to view and observe how the labour is performed.

The common method now practised in planting of the Canes is, to make a trench with the hoe, which is performed by hand; into this one negro drops the number of cuttings intended for planting, at the distance the hills are designed; these are by other negroes placed in their proper position; then the earth is drawn about the hills with a hoe; all this is performed by hand; but if the right use of ploughs was well known, the work might be much better performed, and for less than half the expence; therefore instead of making a trench with a hoe, a deep furrow is made with a plough, and the cuttings properly laid therein, the ground will be deeper stirred, and there will be more depth for placing the Canes.

If the ground is to be afterward kept clean with the horse-hoe, the rows of Canes should be planted five feet asunder, that there may be room for the horse and plough to pass between them; the distance of the hills from each other should be two feet and a half, and but one Cane should be permitted to remain in each hill. After the Canes are planted, and have made some shoots, the sooner the horse-plough is used the better will the Canes thrive, and the ground will be easier kept clean from weeds; for if these are torn up when they are young, they will presently die; whereas, when they are suffered to grow large before they are disturbed, they are with great difficulty destroyed.

As the growth of the Canes is promoted according to the cleanness of the ground, so there cannot be too much care taken to keep the Canes perfectly clear of weeds; the beginning of this work soon will render it less troublesome, and it may be performed at a less expence, than when it is neglected for some time. When this is performed with a plough, the earth in the interval should be thrown up to the rows of Canes, first on one side of the row, being careful not to disturb the roots of the Canes, as also not to bury their new shoots; and in the second operation, the earth should be turned over to the other side of the rows, with

the same care as before. By this turning and stirring of the land, it will be rendered looser, and the earthing of the plants will greatly strengthen them; so that from each hill there will be as many shoots produced, as can be well nourished, and the sun and air will have free ingress among the rows, which will be of the greatest service to the Canes.

When the Canes are from seven to ten feet high, and of a proportionable size; the skin smooth, dry, and brittle, if they are heavy; their pith gray, or inclinable to brown; the juice sweet and glutinous, they are esteemed in perfection.

The time for cutting of the Canes is usually after they have grown six months; but there should not be a fixed period for this, for in some seasons and in different soils, there will be more than a month's difference in their maturity; and those who have made the experiments of cutting their Canes before they were ripe, and letting others stand till after they were ripe, have found the Sugar made from the latter, was much finer than that of the former, though the quantity was not quite so great; however, it will always be best to let them stand till they are in perfection before they are cut, but not longer.

They have also found those Canes which are cut toward the end of the dry seasons, before the rains begin to fall, have produced better Sugar than those which are cut in the rainy seasons, when they are more replete with watery juice; there has also been much less expence of fuel to boil it, which is a material article in large plantations; therefore the better the Canes are nourished in their growth, and the more air and sun is admitted to pass between their rows, the less expence it will be in the boiling and preparing of the Sugar.

In the boiling of Sugar, they use a mixture of wood-ashes and lime, which is called Temper, without which the Sugar will not granulate. The quantity of this mixture, is proportioned to the quality of the ground on which the Canes grew.

SAFFRON. See Crocus.

SAGE. See Salvia.

SAGITTARIA. *Lin. Gen. Plant.* 946. Arrow-head.

The Characters are,

It hath male and female flowers on the same plant; the male flowers have a permanent empalement of three concave leaves; they have three roundish petals, which spread open, and many awl-shaped stamina collected into a head, terminated by erect summits. The female flowers are situated below the male; these have a three-leaved empalement, and three petals as the male, but no stamina; they have many compressed germen collected in a head, sitting upon very short styles, and have permanent acute stigmas. The germen afterward becomes oblong compressed seeds, having longitudinal borders, and are collected in globular heads.

The Species are,

1. SAGITTARIA *foliis omnibus sagittatis acutis petiolis longissimis.* Arrow-head with all the leaves arrow-pointed, and long foot-stalks.

2. SAGITTARIA *foliis sagittatis spatulisque, petiolis longioribus.* Arrow-head with arrow-pointed and spatule-shaped leaves, having longer foot-stalks.

The first sort grows naturally in standing waters in most parts of *England*; the root is composed of many strong fibres, which strike into the mud; the foot-stalks of the leaves are in length proportionable to the depth of the water in which they grow, so they are sometimes almost a yard long; they are thick and fungous; the leaves which float upon the water are shaped like the point of an arrow, the two ears at their base spreading wide asunder, and are very sharp-pointed. The flowers are produced upon long stalks, which rise above the leaves, standing in whorls round them at the joints; they have each three broad white

petals, which spread open, and in the middle is a cluster of stamina with purple summits. The flowers are succeeded by rough heads, containing many small seeds.

The second sort grows plentifully in standing waters near Paris, but has not been found wild in England. This never grows so large as the former; the leaves vary greatly, some of them are oblong, round-pointed, and shaped like a spatula; others are arrow-pointed, but these have their points less acute than those of the former; the flowers are smaller, in which it differs from the former; and as all the plants where this grows retain their difference, so it may be supposed a different species.

SALICARIA. See Lythrum.

SALICORNIA. Tourn. Cor. App. 51. tab. 485. Jointed Glasswort, or Saltwort.

The Characters are,

The flower hath a rugged, swelling, four-cornered empalement, which is permanent. It has no petal, and but one stamina the length of the empalement, crowned by an oblong twin summit, with an oblong oval germen, supporting a single style, crowned by a bifid stigma. The germen afterward becomes a single seed, inclosed in the swelling empalement.

The Species are,

1. SALICORNIA articulis apice crassioribus obtusis. Lin. Mat. Med. 8. Jointed Glasswort with thick obtuse points.

2. SALICORNIA articulis apice acutioribus, caule fruticoso ramoso. Glasswort with acute points to the joints, and a shrubby branching stalk.

The first sort grows plentifully in most of the salt marshes which are overflowed by the tides, in many parts of England. This is an annual plant, with thick succulent jointed stalks, which trail upon the ground. The flowers are produced at the ends of the joints toward the extremity of the branches, which are small, and scarce discernable by the naked eye.

The second sort grows naturally in Sheepey Island; this hath a shrubby branching stalk about six inches long; the points of the articulations are acute, the stalks branch from the bottom, and form a kind of pyramid; they are perennial, and produce their flowers in the same manner as the former.

The inhabitants near the sea coast, where these plants grow, cut them up toward the latter end of summer, when they are fully grown; and after having dried them in the sun, they burn them for their ashes, which are used in making of glass and soap. These herbs are, by the country people called Kelp, and are promiscuously gathered for use.

From the ashes of these plants is extracted the salt, called Sal Kali, or Alkali, which is much used by the chemists.

The manner of gathering and burning of these herbs, is mentioned under the article of SALSOLA, so I shall not repeat it in this place.

SALIX. Tourn. Inst. R. H. 590. tab. 364. The Sallow, or Willow-tree.

The Characters are,

It hath male and female flowers upon separate plants; the male flowers are disposed in one common imbricated katkin. The scales have each one oblong spreading flower, which has no petal, but a cylindrical nectarious gland in the center. It has two slender erect stamina, terminated by twin summits, having four cells. The female flowers are disposed in katkins as the male; these have neither petals or stamina, but an oval-narrowed germen, scarce distinguishable from the style, crowned by two bifid erect stigmas. The germen afterward becomes an oval awl-shaped capsule with one cell, opening with two valves, containing many small oval seeds, crowned with hairy down.

There are several species of this genus, which grow naturally in the northern parts of Europe, which are of no

use, being low creeping shrubs, many of them seldom rising a foot high, so are never cultivated, therefore I shall pass them over, and only enumerate those which are planted for use.

The Species are,

1. SALIX foliis lanceolatis acuminatis serratis utrinque pubescentibus, serraturis infimis glandulosis. Hort. Cliff. 473. Willow with spear-shaped, acute-pointed, sawed leaves, which are downy on both sides, and glands below the saws; or common white Tree Willow.

2. SALIX foliis serratis glabris, floribus triandris. Lin. Sp. Plant. 1015. Willow with smooth sawed leaves, and flowers having three stamina.

3. SALIX foliis serratis glabris, flosculis pentandris. Hort. Cliff. 454. Willow with smooth sawed leaves, and flowers having five stamina; or broad-leaved, smooth, sweet Willow.

4. SALIX foliis serratis ovatis acutis glabris, serraturis cartilagineis, petiolis calloso punctatis. Hort. Upsal. 295. Willow with smooth, oval, acute, sawed leaves, having cartilaginous indentures, and foot-stalks with callous punctures; or yellow Willow.

5. SALIX foliis serratis glabris lanceolatis petiolatis, stipulis trapeziformibus. Flor. Leyd. Prod. 83. Willow with smooth, spear-shaped, sawed leaves, having foot-stalks, and trapezium-shaped stipulæ; or Almon-leaved Willow.

6. SALIX foliis serratis glabris ovato-lanceolatis, petiolis dentato-glandulosis. Flor. Lapp. 349. Willow with oval, spear-shaped, smooth, sawed leaves, and indented glandules to the foot-stalk; the Crack Willow.

7. SALIX foliis serratis glabris lanceolatis, inferioribus oppositis. H. Scan. 252. Willow with smooth, spear-shaped, sawed leaves, the lower of which grow opposite.

8. SALIX foliis subintegerrimis lanceolato-linearibus longissimis acutis subtus sericeis, ramis virgatis. Flor. Suec. 813. Willow with the longest, linear, spear-shaped, acute leaves, which are almost entire, and silky on their under side, and rod-like branches.

9. SALIX foliis serratis glabris lanceolatis, omnibus alternis. Willow with smooth, spear-shaped, sawed leaves, all growing alternate; or Almond-leaved Willow, which casts its bark.

10. SALIX foliis integerrimis lanceolatis longissimis utrinque virentibus. Willow with the longest, spear shaped, entire leaves, which are green on both sides; or the least brittle Willow.

11. SALIX foliis serratis glabris lineari-lanceolatis, ramis pendulis. Hort. Cliff. 454. Willow with smooth, sawed, linear, spear-shaped leaves, and hanging branches; or the weeping Willow.

12. SALIX foliis serratis glabris lanceolato linearibus, superioribus oppositis obliquis. Flor. Leyd. 83. Willow with linear, spear-shaped, smooth, sawed leaves, the upper of which are placed obliquely opposite; or the yellow dwarf Willow.

13. SALIX foliis ovatis rugosis, subtus tomentosiss undatis supernè denticulatis. Flor. Leyd. Prod. 83. Willow with oval rough leaves, which are waved, woolly on their under side, and indented towards the top; or the broad-leaved Willow, or Sallow.

14. SALIX foliis oblongo-ovatis acuminatis rugosis, subtus tomentosiss. Willow with oblong, oval, acute-pointed, rough leaves, which are woolly on their under side; or common Sallow.

The first sort is the common white Willow, which is frequently found growing on the sides of rivers and ditches in many parts of England. It grows to a large size, if the branches are not lopped off; the shoots are covered with a smooth, pale, green bark; the leaves are spear-shaped; they are very white on their under side, and their upper is covered

covered with short, white, woolly hairs, though not so closely as the under; the katkins are short and pretty thick. The wood of this is very white, and polishes smooth.

The second sort grows to be a large tree, the young branches are covered with a grayish bark; the leaves are smooth, of a lucid green, eared at their base, ending in acute points, sawed on their edges, and are green on both sides; the branches grow pretty erect, and are flexible, so this is frequently planted in osier-grounds for the basket-makers. The katkins of this are long, narrow, the scales open, and are acute-pointed.

The third sort hath thick strong shoots, covered with a dark green bark; the leaves are broad, rounded at both ends, very smooth, sawed on their edges, and when rubbed have a grateful odour. It is sometimes called the Bay-leaved Willow, and at others the sweet Willow; it grows quick, and is a tree of middling size; the branches are brittle, so are not proper for many purposes.

The fourth sort has slender tough shoots, which are of a yellow colour; the leaves are oval, acute-pointed, smooth, and sawed on their edges; the saws are cartilaginous, and the foot-stalks of the leaves have callous punctures. This is very pliable, so is much planted in the osier-grounds for the basket-makers, but it never grows to a large size.

The fifth sort grows to a pretty large size; the shoots are erect, covered with a light green bark; the leaves are spear-shaped, of a lucid green on both sides, sawed on their edges, standing upon short foot-stalks; they have stipulæ in form of a trapezium, at the base of the foot-stalk. The twigs of this sort are flexible, and fit for the use of basket-makers.

The sixth sort grows to a middling size; the shoots of this are very brittle, so are unfit for the basket-makers, and are covered with a brownish bark; the leaves are of a lucid green on both sides, and sawed on their edges; the katkins are long and slender; the scales are pretty long, acute-pointed, and stand open. It is commonly called Crack Willow, from the branches being very brittle.

The seventh sort is a tree of middling size; the shoots are very pliable, and fit for the basket-makers, so is much planted in the osier-grounds; they are of a reddish colour; the leaves are spear-shaped, smooth, and sawed on their edges; those on the lower part of the branches are placed opposite, but on the upper they are alternate, and of a yellowish green.

The eighth sort makes very long shoots, but the tree seldom grows to a large size; the leaves are very long, entire, and are set close upon the branches; they are of a dark green on their upper side, but very woolly and white on their under, ending in acute points. The young branches are woolly, and their buds are very turgid. This is pretty much planted in the osier-grounds, for the use of basket-makers.

The ninth sort is a tree of middling growth; it casts its bark annually; the shoots are brittle; they have a yellowish bark; the leaves are spear-shaped, sawed on their edges; they are eared on both sides at their base, and are placed alternate, of a light green on both sides. This is not very commonly cultivated, the twigs being too brittle.

The tenth sort hath very pliant branches, so is much planted in the osier-grounds. The leaves of this are very long, spear-shaped, entire, and are green on both sides. It grows to a middling size, if planted in moist land.

The eleventh sort grows naturally in the *Levant*, but has been several years cultivated in the *English* gardens. This will grow to a middling size; the branches are long, slender, and hang down on every side, so form natural arches; the leaves are narrow, spear-shaped, smooth, and sawed on their edges. It is well known in the gardens, by the title of Weeping Willow.

The twelfth sort is a tree of lower growth; the branches of this are erect; the leaves are smooth, narrow, spear-shaped, sawed on their edges, of a dark or bluish green, and toward the upper part of the branches are placed opposite. It is found by the side of ditches, in many parts of *England*.

The thirteenth sort grows naturally upon dry land, and on high situations, but rarely is of a large size; the bark is smooth, and of a dark gray colour; the branches are brittle, so are unfit for basket-makers, but it is frequently cultivated in hedges for fuel in many parts of *England*. It is called Mountain Osier. The leaves are oval, rough, woolly, and indented toward the top. There is a variety of this in the gardens with variegated leaves.

The fourteenth sort is the common Sallow; this differs from the last, in having longer leaves, which end in acute points; they are woolly on their under side, and fit closer to the branches; these are not distinguished by the farmers, who cultivate them equally.

There are some other sorts of Willows which are planted in the osier-grounds, distinguished by the basket-makers and dealers in them, under titles they have applied to them, which are little known to others; these are annually cut down, and always kept low, but when they are not cut down, and have room to grow, will become large trees; so that they may be planted for the same purposes as the first sort, and will make a variety when intermixed with it, though they are commonly cultivated for their twigs, which produce good profit to the owners of the land.

All the sorts of Willows may be easily propagated by planting cuttings or sets, either in the spring or autumn, which readily take root. Those sorts which grow to be large trees, are cultivated for their timber, so are generally planted from sets, which are about seven or eight feet long; these are sharpened at their larger end, and thrust into the ground by the sides of ditches and banks, where the ground is moist; in which places they make a considerable progress, and are a great improvement to such estates, because their tops will be fit to lop every fifth or sixth year. This is the usual method now practised in most parts of *England*, where the trees are cultivated, as they are generally intended for present profit; but if they are designed for large trees, or are cultivated for their wood, they should be planted in a different manner, for those which are planted from sets of seven or eight feet long, always send out a number of branches toward the top, which spread, and form large heads fit for lopping; but their principal stem never advances in height, therefore where regard is paid to that, they should be propagated by short young branches, which should be put almost their whole length in the ground, leaving only two, or at most but three buds out of the ground, and, when these have made one year's shoot, they should be all cut off except one of the strongest and best situated, which must be trained up to a stem, and treated in the same way as timber trees. If these are planted with such design, the rows should be four feet asunder, and the sets two feet distance in the rows; by planting them so close, they will naturally draw each other upward, and, when they are grown so large as to cover the ground and meet, they should be gradually thinned, so as at the last to leave every other row, and the plants in the rows about eight feet asunder. If they are so treated, the trees will grow to a large size, and rise with upright stems to the height of forty feet or more.

When these cuttings are planted, it is usual to sharpen the ends to a point, which are put into the ground, for the better thrusting of them in; but the best way is to cut them horizontally just below the bud or eye, and to make holes with an iron instrument in the ground where each

cutting is to be planted, and, when they are put in, the ground should be pressed close about the cuttings with the heel to settle it; and prevent the air from penetrating to the cuttings.

The after care must be to keep them clear from weeds the two first seasons, by which time they will have acquired so much strength, as to over-power and keep down the weeds; they will also require some trimming in winter to take off any lateral shoots, which, if suffered to grow, would retard their upright progress.

There are great tracts of land in *England* fit for this purpose, which at present produce little to the owners, and might, by the planting of these trees, turn to as good account as the best Corn land. The larger wood, if found, is commonly sold to the turners for many kinds of light ware, but may be applied to many other purposes.

The Sallows are commonly planted in cuttings about three feet long, made from strong shoots of the former year; these are thrust down two feet deep into the ground. The cuttings should be placed about three feet row from row, and eighteen inches asunder in the rows, observing always to plant the rows the sloping way of the ground (especially if the tides overflow the place); because, if the rows are placed the contrary way, all the filth and weeds will be detained by the sets, which will choak them up.

The best season for planting these cuttings in the open-grounds is in *February*, for if they are planted sooner, they are apt to peel, if it proves hard frost, which greatly injures them. These plants are always cut every year, and, if the soil be good, they will produce a great crop, so that the yearly produce of one acre has been often sold for fifteen pounds, but ten pounds is a common price, which is much better than Corn land, so that it is great pity these plants are not more cultivated, especially upon moist soils, upon which few other things will thrive.

SALSOLA. *Lin. Gen. Plant.* 275. Glasswort.

The Characters are,

The empalement of the flower is permanent, composed of five oval obtuse leaves; the flower has no petals, but hath five short stamina, which are inserted in the divisions of the empalement; it hath a globular germen, with a short two-pointed style, crowned by recurved stigmas. The germen afterward becomes a globular capsule, with one cell wrapped up in the empalement, inclosing one large seed.

The Species are,

1. SALSOLA herbacea, foliis subulatis mucronatis, calycibus ovatis axillaribus. *Lin. Sp. Plant.* 222. Herbaceous Salsola with awl-shaped sharp-pointed leaves, and oval empalements proceeding from the sides of the stalks.

2. SALSOLA herbacea, foliis linearibus mucronatis, calycibus obtusis axillaribus. Herbaceous Salsola with linear acute-pointed leaves, and obtuse empalements proceeding from the sides of the stalks.

3. SALSOLA herbacea, foliis inermibus. *Cuett. Stamp.* 426. Herbaceous Salsola with smooth leaves.

4. SALSOLA frutescens, foliis ovatis acutis carnosis. *Lin. Sp. Plant.* 223. Shrubby Salsola with oval, fleshy, acute-pointed leaves.

5. SALSOLA herbacea, foliis subulatis mucronatis, calycibus explanatis. *Lin. Sp. Plant.* 222. Herbaceous Salsola with pointed awl-shaped leaves, and spreading empalements.

The first sort grows naturally in the salt marshes in divers parts of *England*. It is an annual plant, which rises about five or six inches high, sending out many side branches, which spread on every side, garnished with short awl-shaped leaves, which are fleshy, and terminate in acute spines. The flowers are produced from the side of the branches, to which they sit close, and are encompassed by short prickly leaves; they are small, of an herbaceous colour. The seeds

are wrapped up in the empalement of the flower, and ripen in autumn, soon after which the plants decay.

The second sort grows naturally on the sandy shores of the south of *France*, *Spain*, and *Italy*. This is also an annual plant, which sends out many diffused stalks, garnished with linear leaves an inch long, ending with sharp spines. The flowers come out from the side of the stalks in the same manner as those of the former; their empalements are blunt, and not so closely encompassed with leaves as those of the other.

The third sort rises with herbaceous stalks near three feet high, spreading wide. The leaves on the principal stalk, and those on the lower part of the branches, are long, slender, and have no spines; those on the upper part of the stalk and branches are slender, short, and crooked. At the base of the leaves are produced the flowers, which are small, and hardly perceptible; the empalement of the flower afterward encompasses the capsule, which contains one coheated seed.

The fourth sort grows naturally in *Spain*. This hath shrubby perennial stalks, which rise three or four feet high, sending out many side branches, garnished with fleshy, oval, acute-pointed leaves, coming out in clusters from the side of the branches; they are hoary, and have no stiff prickles. The flowers are produced from between the leaves toward the ends of the branches; they are so small as scarce to be discerned, unless they are closely viewed. The seeds are like those of the other kinds.

The fifth sort grows naturally in *Tartary*. This is an annual plant, whose stalks are herbaceous, and seldom rise more than five or six inches high. The leaves are awl-shaped, ending in acute points; the empalements of the flowers spread open; the flowers are small, and of a Rose colour, but soon fade; the seeds are like those of the other sorts.

All the sorts of Glasswort are sometimes promiscuously used for making the Sal Alkali, but it is the third sort which is esteemed best for this purpose. The manner of making it is as follows: Having dug a trench near the sea, they lay laths across it, on which they lay the herb in heaps, and, having made a fire below, the liquor, which runs out of the herbs, drops to the bottom, which at length thickening becomes Sal Alkali, which is partly of a black, and partly of an Ash-colour, very sharp and corrosive, and of a saltish taste. This, when thoroughly hardened, becomes like a stone, and is there called Soude or Sode. It is transported from thence to other countries for making of glass.

SALVIA. *Tourn. Inst. R. H.* 180. tab. 83. Sage.

The Characters are,

The empalement of the flower is tubulous, of one leaf, large at the mouth, where it is cut into four parts. The flower is of the lip kind, of one petal; the lower part is tubulous, the upper is large and compressed; the lower lip is broad and trifid. It has two short stamina, which stand transverse to the lip, and are fixed in the middle to the tube, to whose tops are fixed glands, upon the upper side of which sit the summits; it has a four-pointed germen, supporting a long slender style, situated between the stamina, crowned by a bifid stigma. The germen afterward becomes four roundish seeds, which ripen in the empalement.

The Species are,

1. SALVIA foliis lanceolatis-ovatis integris crenulatis, floribus verticillato-spicatis. Sage with spear-shaped, oval, entire leaves, which are slightly crenated on their edges, and flowers growing in whorled spikes.

2. SALVIA foliis infimis cordatis, summis oblongo-ovatis serratis tomentosis, floribus verticillato-spicatis. Sage with heart-shaped lower leaves, the upper of which are oblong, oval,

oval, sawed, and woolly, and flowers growing in whorled spikes.

3. *SALVIA foliis lanceolatis sæpius articulatis subtus tomentosis, floribus spicato-verticillatis, calycibus ventricosus*. Sage with spear-shaped leaves, which are frequently eared, and woolly on their under side, flowers growing in whorled spikes, and bellied empalements; commonly called Sage of Virtue.

4. *SALVIA foliis lineari-lanceolatis integerrimis tomentosis, floribus spicatis calycibus brevissimis ventricosus acutis*. Sage with linear, spear-shaped, woolly, entire leaves, spiked flowers, and the shortest bellied empalements, ending in acute points.

5. *SALVIA foliis infimis pinnatis, summis ternatis rugosis, floribus spicatis, caule fruticoso tomentoso*. Sage with winged lower leaves, the upper ones trifoliate and rough, flowers growing in spikes, and a shrubby woolly stalk.

6. *SALVIA foliis lanceolato-ovatis integris crenulatis, floribus spicatis, calycibus obtusis*. Hort. Cliff. 12. Sage with spear-shaped, oval, entire leaves, which are slightly crenated, spiked flowers, and blunt empalements.

7. *SALVIA foliis compositis pinnatis*. Hort. Cliff. 13. Sage with compound winged leaves.

8. *SALVIA foliis infimis pinnatis, summis simplicibus crenatis, floribus verticillatis caulibus procumbentibus hirsutissimis*. Sage with winged lower leaves, the upper ones single and crenated, flowers growing in whorls, and the most hairy trailing stalks.

9. *SALVIA foliis cordatis obtusis crenatis subtomentosis, corollis calyce angustioribus*. Lin. Sp. Plant. 25. Sage with heart-shaped, blunt, crenated leaves, which are somewhat woolly, and the petals narrower than the empalement.

10. *SALVIA foliis subrotundis integerrimis, basi truncatis dentatis*. Hort. Cliff. 13. Sage with roundish entire leaves, which are torn, and indented at their base.

11. *SALVIA foliis subrotundis serratis, basi truncatis dentatis*. Hort. Cliff. 13. Sage with roundish sawed leaves, which are torn, and indented at their base.

12. *SALVIA foliis oblongo-ovatis integerrimis, calycibus patulis coloratis*. Tab. 225. fig. 2. Sage with oblong, oval, entire leaves, and spreading coloured empalements.

The first sort is the common large Sage, which is cultivated in gardens, of which there are the following varieties: 1. The common green Sage. 2. The Wormwood Sage. 3. The green Sage with a variegated leaf. 4. The red Sage. 5. The red Sage with a variegated leaf; these are accidental variations, and therefore are not enumerated as species. The common Sage grows naturally in the southern parts of *Europe*, but is here cultivated in gardens for use; but that variety, with red or blackish leaves, is the most common in the *Engliff* gardens, and the Wormwood Sage is in greater plenty here than the common green-leaved Sage, which is but in few gardens. The common Sage is so well known, as to require no description.

The second sort is generally titled Balsamick Sage by the gardeners. The stalks of this do not grow so upright as those of the common Sage; they are very hairy, and divide into several branches, which are garnished with broad, heart-shaped, woolly leaves, standing upon long foot-stalks; they are sawed on their edges, and their upper surfaces are rough; the leaves, which are upon the flower-stalks, are oblong and oval, standing upon shorter foot-stalks, and are very slightly sawed on their edges; the flowers grow in whorled spikes toward the top of the branches; the whorls are pretty far distant, and but few flowers in each; they are of a pale blue, about the size of those of the common sort. This Sage is preferred to all the others for making tea.

The third sort is the common Sage of Virtue, which is also well known in the gardens and markets. The leaves

of this are narrower than those of the common sort; they are hoary, and some of them are indented on their edges toward the base, which indentures have the appearance of ears. The spikes of flowers are longer than those of the two former sorts, and the whorls are generally naked, having no leaves between them. The flowers are smaller, and of a deeper blue than those of the common red Sage.

The fourth sort grows naturally in *Spain*. The leaves of this are very narrow and entire, standing in clusters on the side of the stalks; they are very hoary, and the branches are covered with a hoary down; the leaves on the upper part of the stalk are narrower than those of *Rosemary*; the flowers grow in closer spikes than either of the former, and are of a light blue colour.

The fifth sort grows naturally about *Smyrna*, from whence the late Dr. *William Sherard* sent the seeds. This rises with a shrubby stalk four or five feet high, and divides into several branches, which grow erect. The leaves on the lower branches are winged, being composed of two or three pair of small lobes, terminated by one large one. Those which grow on the flowering branches are trifoliate, the two inner lobes being small, and the outer one is large, ending in a point; they have the flavour of *Wormwood*, and their upper surface is rough. The flowers grow in long spikes at the end of the branches; the whorls are pretty close to each other, and have no leaves between them; the flowers are large, of a flesh colour.

The sixth sort grows naturally in *Crete*. This hath a shrubby stalk, which rises four or five feet high, dividing into several branches, garnished with spear-shaped, oval, woolly leaves, which are entire, and slightly crenated on their edges. The flowers grow in spikes at the end of the branches; they are of a pale blue colour, and have obtuse empalements. The branches of this Sage have often punctures made in them by insects, at which places grow large protuberances as big as Apples, in the same manner as the galls upon the Oak, and the rough balls on the Briar.

The seventh sort grows naturally in the *Levant*. This is an annual plant with trailing stalks. The leaves on the lower part of the stalks are composed of two or three small pair of lobes, terminated by one large one; those farther up are trifoliate, the outer lobe being four times the size of the side ones. The flowers grow in whorls round the stalks; they are large, and of a deep blue colour, as are also their empalements.

The eighth sort grows naturally about *Smyrna*, where the late Dr. *Sherard* gathered the seeds. This is a perennial plant with trailing stalks, which grow near two feet long, garnished toward the bottom with leaves, composed of two pair of small lobes, terminated by a large one, but those toward the top are single, and stand opposite. The flowers are produced in whorls round the stalks; they are large, and of a flesh colour, but are not succeeded by seeds here.

The ninth sort grows naturally at *Mexico*. This is an annual plant, which rises with an erect, four cornered, branching stalk three feet high, garnished with large heart-shaped leaves, of a bright green colour, which are obtusely crenated on their edges, having several veins on their lower side, which diverge from the midrib to the sides. Their foot-stalks are long and slender; the flowers are produced in close spikes at the end of the branches; they are of a fine blue colour, and their tubes are narrower than the empalement.

The tenth sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk seven or eight feet high, covered with a light-coloured bark, sending out branches the whole length, which grow almost horizontally; they are garnished with roundish gray leaves, which are entire, and seem torn at their base, where they are also indented.

The flowers are produced in thick short spikes at the end of the branches; they are very large, and of a dark gold colour.

The eleventh sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk four or five feet high, dividing into branches, garnished with oval sawed leaves of a gray colour, which have one or two indentures at their base that seem torn. The flowers come out in whorls toward the end of the branches; they are of a fine blue colour, and larger than those of the common Sage; these appear in succession most of the summer months, and those which come early, are often succeeded by seeds, which ripen in autumn.

The twelfth sort has been lately raised in the *Dutch* gardens from seeds, which were brought from the *Cape of Good Hope*. It has great resemblance to the former, but the branches are stronger and grow more erect; the leaves are longer, and not so broad; their edges are not sawed; the flowers grow in long loose spikes at the end of the branches; they are larger, and of a paler blue than the other; their empalements are broader, spread wider, and are of a pale blue colour, in which consists their difference.

All the sorts of Sage may be propagated by seeds, if they can be procured; but, as some of them do not perfect their seeds in *England*, and most of the sorts, but especially the common kinds for use, are easily propagated by slips, it is not worth while to raise them from seeds. The slips should be planted the beginning of *April* on a shady border, where, if they are now and then refreshed with water, if the season should prove dry, they will soon take root. When the slips have made good roots, they may be taken up with balls of earth to their roots, and transplanted where they are to remain, which should always be upon a dry soil, and where they may have the benefit of the sun, for if they are planted on a moist soil, or in a shady situation, they are very subject to be destroyed in winter; nor will these plants endure the cold so well, when planted upon a rich soil, as those which have a barren, dry, rocky soil, which is the case of most of the verticillate plants, for these will often grow upon walls, where, although they are more exposed to the cold than those plants in the ground, they are always found to remain in severe winters when the others are destroyed. The side shoots and tops of these plants may be gathered in the summer, and dried, if designed for tea, otherwise they are best taken green from the plants for most other uses. The roots of the common sorts of Sage will last several years, if they are in a dry warm soil, but, where they are often cropped for use, the plants will become ragged, so there should be a succession of young ones raised every other year.

The fifth, sixth, and eighth sorts, are somewhat tender, so will not live through the winter in the open air in *England*; therefore these must be planted in pots, and in winter must be removed under a hot-bed frame, that they may have a great share of fresh air whenever the season is mild, for if they are too much drawn, they seldom flower well, and make but an indifferent appearance. In summer they must be exposed amongst other exotick plants in some well-sheltered situation, for they are pretty hardy, and only require to be sheltered from the frost. These plants must be often refreshed with water in warm weather, otherwise they will shrivel and decay, and they should be new-potted at least twice every summer, because their roots will greatly increase, which, if confined in the pots too long, will turn mouldy, and decay.

The seventh and ninth sorts are annual plants, so are only propagated by seeds; these may be sown upon a bed of light earth in the places where they are to remain. The seeds of the seventh sort should be sown in autumn,

and then the plants will come up the following spring, but, if they are kept out of the ground till spring, the plants will not come up till the next year. Those of the ninth sort may be sown the beginning of *April* upon a warm border, where the plants will appear in *May*, and require no other care but to thin them where they grow too close, and keep them clean from weeds, and, if they should grow tall, they must be supported, otherwise the strong winds will break them down; but the seventh sort spreads its branches upon the ground, so will require no support, therefore this only requires to have room, and to be kept clean from weeds.

The tenth, eleventh, and twelfth sorts are natives of a warmer country, so these require protection in winter; they are easily propagated by cuttings in the spring and summer months. If these are planted early in the spring, it will be the better way to plant them in pots, which should be plunged into a very moderate hot-bed, and, if they are shaded from the sun in the heat of the day, and gently refreshed with water, they will put out good roots in about two months, when they should be inured gradually to the open air, into which they should be removed soon after. The cuttings which are raised early in the season, will become strong plants before winter, so will be in a better condition to resist the cold than those which are weak.

If the cuttings are planted in summer, they will require no artificial heat, so that if these are planted on a bed of fresh loamy earth, and covered close down with a bell or hand-glass, and shaded from the sun in the heat of the day, giving them now and then a little water, they will take root freely, and when they begin to shoot, they should have free air admitted to them by raising the glass on one side, and so gradually exposed to the open air. When the cuttings are well-rooted, they should be each transplanted into a separate small pot, and placed in a shady situation till they have taken new root; then they may be removed to a sheltered situation, where they may remain till the approach of frost, when they must be carried into shelter, and in winter treated in the same manner as other hardy green-house plants, which only require protection from frost, observing not to over-water them during the cold weather, but in summer, when they are in the open air, they will require it often.

SALVIA AGRESTIS. See *Teucrium*.

SAMBUCUS. *Tourn. Inst. R. H.* 606. *tab.* 376. The Elder-tree.

The Characters are,

The flower has a small permanent empalement of one leaf, cut into five parts; it has one concave wheel-shaped petal cut into five obtuse segments at the brim, which are reflexed, and five awl-shaped stamina the length of the petal, terminated by roundish summits, with an oval germen situated under the flower, having no style, in room of which is a swelling gland, crowned by three obtuse stigmas. The germen afterward becomes a roundish berry with one cell, including three angular seeds.

The Species are,

1. SAMBUCUS caule arboreo ramoso, floribus umbellatis. *Flor. Leyd. Prod.* 243. Elder with a branching tree-like stalk, and flowers growing in umbels; or common Elder with black berries.

2. SAMBUCUS foliis pinnatifidis, floribus umbellatis, caule fruticoso ramoso. Elder with wing-pointed leaves, flowers growing in umbels, and a shrubby branching stalk; commonly called Parsley-leaved Elder.

3. SAMBUCUS racemis compositis ovatis, caule arboreo. *Lin. Sp. Plant.* 270. Elder with oval compound bunches of flowers, and a tree-like stalk; or red-berryed Mountain Elder.

4. *SAMBUCUS caule herbaceo ramoso, foliolis dentatis.* Tab. 226. Elder with a branching herbaceous stalk, and the small leaves indented; or dwarf Elder.

5. *SAMBUCUS caule herbaceo ramoso, foliolis linearilanceolatis acutè dentatis.* Elder with an herbaceous branching stalk, and linear spear-shaped lobes, which are sharply indented; dwarf Elder with a cut leaf.

6. *SAMBUCUS cymis quinquepartitis, foliis subpinnatis.* Lin. Sp. Plant. 269. American Elder with leaves almost winged.

The first sort here mentioned is the common Elder, which is so well known as to need no description. Of this there are the following varieties, *viz.* The white and green-berried Elder, and the variegated-leaved Elder. The latter is undoubtedly a variety, but I much doubt if the white is not a distinct species, for the lobes of the leaves are much less, and very slightly sawed on their edges, whereas those of the common sort are deeply sawed; they are also smoother, and of a lighter green; the plants which have been raised from the berries, have not altered, so there is great reason for supposing them different species; but as I have made but one trial of this, I am unwilling to determine upon a single experiment, but shall leave it as a doubt till further trial is made.

The second sort is generally titled Parsley-leaved Elder by the gardeners; this is by some supposed to be only a variety of the first, but there can be little reason for doubting of its being a distinct species. The lobes of these leaves are narrower than those of the first, and are cut into several fine segments; these are again deeply indented on their edges regularly, in form of winged leaves. The stalks of this are much smaller than those of the first, and the shoots are short; the leaves have not so strong an odour, and their berries are a little smaller.

The third sort grows naturally upon the mountains in *Germany* and *Italy*. This sends up many shrubby stalks from the root, which rise ten or twelve feet high, which divide into many branches, covered with a brown bark; the leaves come out opposite; those on the lower part of the branches are composed generally of two pair of lobes, terminated by an odd one; these are shorter and broader than those of the common Elder, and are deeply sawed on their edges; the leaves on the upper part of the branches have frequently but three lobes; they are of a pale green colour, and pretty smooth. The flowers come out at the end of the shoots in oval bunches, which are composed of several smaller; they are of an herbaceous white colour, and are succeeded by berries, which are red when ripe.

The fourth sort grows naturally in many of the midland counties in *England*, where it is frequently a troublesome weed in the fields; this is called dwarf Elder, Danewort, and Walwort. It hath creeping roots, which spread far in the ground, so propagates very fast where-ever the plant once gets possession; the stalks are herbaceous, and rise from three to five feet high, in proportion to the goodness of the ground, and send out a few side branches toward the top, garnished with winged leaves, composed of six or seven pair of narrow lobes, terminated by an odd one, of a deep green, a little indented on their edges. The flowers grow in umbels at the top of the stalks; they are of the same form with those of the common Elder, but smaller, and are spotted with red. These are succeeded by black berries like those of the common Elder, but smaller.

This plant is frequently used in medicine; it purges serous watery humours by stool, and is therefore much recommended for the dropsy, in which disorder I have known the juice of this plant perform wonders in a short time; it was administered three times a week, two spoonfuls was the dose given at each time. It is also accounted a good medicine for the gout, and scorbutick disorders. The young

shoots of the common Elder are frequently sold for this in the markets, from which it may be easily distinguished, by the number and shape of the lobes on each leaf: the common Elder has seldom more than five lobes, which are broader and much shorter than those of the dwarf Elder, and are pretty deeply sawed on their edges; but the leaves of the dwarf Elder have nine, eleven, or thirteen lobes to each leaf, which are long, narrow, and very slightly indented on their edges.

The roots of the fifth sort do not creep so much in the ground as those of the fourth; the stalks are herbaceous, but do not rise so high, and are closer garnished with leaves, which have seldom more than seven lobes to each, and toward the top of the stalks but five; these are long and narrower than those of the former, and are deeply cut on their edges, ending with winged acute points. The flowers are produced in umbels at the top of the stalks, which are shaped like those of the former, and are succeeded by the like berries.

The sixth sort grows naturally in *Canada*, and several other parts of *North America*, where it grows as large as our common Elder. This sort, when young, and the shoots are full of sap, is tender, so that the frost often kills them almost to the ground; but when the plants become woody, they are rarely hurt. The leaves of this are narrower than those of the common Elder, and are composed of many more pinnæ; the berries are also smaller, in which the difference chiefly consists.

The three first and sixth sorts may be easily propagated from cuttings, or by sowing their seeds; but the former being the most expeditious method, is generally practised. The season for planting of their cuttings is any time from *September* to *March*; in the doing of which, there needs no more care than to thrust the cuttings about six or eight inches into the ground, and they will take root fast enough, and may afterwards be transplanted where they are to remain, which may be upon almost any soil or situation; they are extreme hardy, and if their seeds are permitted to fall upon the ground, they will produce plenty of plants the succeeding summer.

The first sort is often planted for making fences, because of the quick-growth; but as the bottom becomes naked in a few years, it is not so proper for that purpose; neither would I recommend it to be planted near habitations, because at the season when it is in flower, it emits such a strong scent, as will occasion violent pains in the heads of those who abide long near them; besides, the crude parts which are continually perspired through the leaves, are accounted unwholesome, though the leaves, bark, and other parts, are greatly esteemed for many uses in medicine.

The fourth sort propagates itself fast enough where-ever it is once planted, by its creeping roots, so that it is very difficult to keep it within bounds, therefore is not a proper plant for gardens; but those who are inclined to keep it for medicinal use, need only plant one or two of the roots in any abject part of a garden or field, and the place will soon be spread over with it.

The fifth sort is preserved in botanick gardens for the sake of variety, but is seldom admitted into other gardens. This propagates by the root, though not so fast as the other.

The common Elder will grow upon any soil, or in any situation; the trees are frequently seen growing on the top, and out of the side of old walls; and they are often seen growing close to ditches, and in very moist places, so that where-ever the seeds are scattered, the plants will come up, as they often do from the hollow of another tree. The leaves and stalks of this plant are so bitter and nauseous, that few animals will browse upon it. I have often seen the trees growing in parks, where there has been variety

of animals, and have observed they were untouched, when almost all the other trees within reach have been cropped by the cattle.

The young shoots of this tree are strong and very full of pith, but as the trees grow old, their wood becomes very hard, and will polish almost as well as that of the Box-tree, so is often used for the same purposes, when Box-wood is scarce.

The bark, leaves, flowers, and berries of this tree, are used in medicine. The inner bark is esteemed good for dropfies; the leaves are outwardly used for the piles and inflammations. The flowers are inwardly used to expel wind, and the berries are esteemed cordial and useful in hysteric disorders, and are frequently put into gargarisms for sore mouths and throats.

SAMOLUS. *Tourn. Inst. R. H.* 143. tab. 60. Round-leaved Water Pimpernel.

The Characters are,

The empalement of the flower is permanent, erect, and cut into five segments. It has one petal, with a short spreading tube; the brim is plain, obtuse, and cut into five parts. It has five short stamina placed between each segment of the petal, terminated by summits which join together. The germen is situated under the flower, supporting a slender style, crowned by a headed stigma. The germen afterward becomes an oval capsule with one cell, cut half through into five valves, filled with small oval seeds.

We have but one Species of this plant, which is,

SAMOLUS *valerandi*. *J. B.* Round-leaved Water Pimpernel.

This plant grows wild in swampy places, where the water usually stands in winter, and is seldom preserved in gardens. It is an annual plant, which flowers in June, and the seeds are ripe in August; at which time, whoever hath a mind to cultivate this plant, should sow the seeds on a moist soil, where the plants will come up, and require no father care, but to keep them clear from weeds.

SAMYDA. *Lin. Gen. Plant.* 525.

The Characters are,

The flower has a rough bell shaped empalement of one leaf, which is cut at the brim into five points. It has no petal, but has fifteen short awl-shaped stamina, inserted in the empalement, terminated by oval summits, and a hairy globular germen, supporting a cylindrical style, crowned by a headed stigma. The germen afterward becomes an oval berry with four furrows, having four cells, including many kidney-shaped seeds, immersed in the oval receptacle.

The Species are,

1. SAMYDA *foliis ovatis serratis, floribus axillaribus*. Samyda with oval sawed leaves, and flowers growing from the wings of the stalks.

2. SAMYDA *foliis compositis pinnatis*. Samyda with compound winged leaves.

These plants grow naturally in the *West-Indies*; the first sort rises with a shrubby stalk five or six feet high, sending out several weak branches, garnished with oval leaves drawing to a point, sawed on their edges, of a light green colour. The flowers come out from the wings of the leaves upon short foot-stalks; they have a five-leaved empalement, which is of a bright-red within; the stamina, which are about fifteen in number, are inserted in the middle of the empalement, and stand erect; in the center is situated an oval germen, which turns to a berry with four cells, containing small seeds.

The other sort has leaves shaped like those of the Walnut-tree, but are smaller, and the inside of the empalement is of a purple colour, in which it differs from the first.

These plants are propagated by seeds, which must be procured from the countries where they naturally grow;

these must be sown upon a hot-bed in the spring, and when the plants come up, they must be planted in small pots, and plunged into a hot-bed of tanners bark, and treated in the same way as other tender plants from the same countries. They must be always kept in the bark-bed in the stove, otherwise they will make but little progress in *England*.

SANGUINARIA. *Dill. Hort. Elth.* 252. Puccoon.

The Characters are,

The empalement of the flower is composed of two oval concave leaves, which fall away. It hath eight oblong, obtuse, spreading petals, which are alternately narrow. It has many single stamina, which are shorter than the petals, terminated by single summits, and an oblong compressed germen, having no style, crowned by a permanent thick stigma, with two channels. The germen becomes an oblong bellied capsule with two valves, pointed at both ends, inclosing round acute-pointed seeds.

We have but one Species of this genus, viz.

SANGUINARIA. *Hort. Cliff.* 202. Puccoon.

There are some other varieties of this plant mentioned in the *Eltham* garden, but they are not distinct species, for they vary annually, therefore it is to no purpose to mention their variations.

It is a native of most of the northern parts of *America*, where it grows plentifully in the woods; and in the spring, before the leaves of the trees come out, the surface of the ground is, in many places, covered with the flowers, which have some resemblance to our Wood Anemone, but they have short naked pedicles, each supporting one flower at the top. Some of these flowers will have ten or twelve petals, so that they appear to have a double range of leaves, which has occasioned their being termed double flowers; but this is only accidental, the same roots in different years producing different flowers. The roots of this plant are tuberous, and the whole plant has a yellow juice, which the *Indians* use to paint themselves with.

This plant is hardy enough to live in the open air in *England*, but it should be planted in a loose soil and a sheltered situation, not too much exposed to the sun. It is propagated by the roots, which may be taken up and parted every other year; the best time for doing of this is in September, that the roots may have time to send out fibres before the hard frost sets in. The flowers of this plant appear in April, and when they decay, the green leaves come out, which will continue till *Midsummer*; then they decay, and the roots remain unactive till the following autumn; so that unless the roots are marked, it will be pretty difficult to find them, after their leaves decay, for they are of a dirty brown colour on the outside, so are not easily distinguished from the earth.

SANGUIS DRACONIS. See Palma.

SANGUISORBA. *Lin. Gen. Plant.* 136. Burnet.

The Characters are,

The empalement of the flower is composed of two short leaves placed opposite, which fall away. The flower hath one plain petal, cut into four obtuse segments, which join at their base. It has four stamina the length of the petal, terminated by small roundish summits, and a four-cornered germen, situated between the empalement and petal, supporting a short slender style, crowned by an obtuse stigma. The germen afterward turns to a small capsule with two cells, filled with small seeds.

The Species are,

1. SANGUISORBA *spicis ovatis*. *Hort. Cliff.* 39. Sanguisorba with oval spikes; or greater Burnet.

2. SANGUISORBA *spicis cylindricis, foliolis cordato-oblongis, rigidis, serratis*. Sanguisorba with cylindrical spikes, the lobes of the leaves oblong, heart-shaped, stiff, and sawed.

3. SANGUISORBA *spicis orbiculatis compactis*. Sanguisorba with round compact spikes.

4. SANGUI

4. *SANGUISORBA spicis longissimis*. Hort. Cliff. 39. Sanguisorba with the longest spikes; or greatest Canada Burnet.

The first sort grows naturally in moist meadows in divers parts of England. The stalks of this rise from two to three feet high, branching toward the top, and are terminated by thick oval spikes of flowers, of a grayish brown colour, which are divided into four segments almost to the bottom. These are succeeded by four oblong cornered seeds. The leaves of this sort are composed of five or six pair of lobes placed along a midrib, terminated by an odd one; they are thin, sawed on their edges, and a little downy on their under side.

The second sort grows naturally in Piedmont. This rises with stiff upright stalks more than three feet high, branching out toward the top, each branch being terminated by a cylindrical spike of brown flowers, shaped like those of the former sort, but smaller. The leaves are long, their foot-stalks are very strong, and much longer than those of the first sort; the leaves have seven or eight pair of stiff lobes, terminated by an odd one; these are heart-shaped, deeply sawed on their edges, of a lucid green on their upper side, but pale on their under, having pretty long foot-stalks, at the base of which come out two small roundish leaves or ears, which are deeply indented. This retains its difference when propagated by seeds, so is undoubtedly a distinct species.

The leaves of the third sort are smaller than those of the first, having but four pair of lobes to each, terminated by an odd one; they are bluntly sawed on their edges, and have very short foot-stalks, of a pale green on their upper side, and hoary on their under. The stalks rise about two feet high, branching pretty much toward their top, and are terminated by round heads or spikes of reddish flowers, which are succeeded by seeds in autumn. It grows naturally in Spain.

The fourth sort grows naturally in North America. This hath leaves like those of the first sort, but are a little stiffer, composed of four or five pair of lobes, terminated by an odd one; those on the lower part of the midrib stand alternate, but the two upper pair are opposite, of a light green colour, and deeply sawed on their edges. The stalks rise three feet high, dividing toward the top into small branches, which stand erect, and are terminated by long spikes of flowers, of an herbaceous white colour, each standing upon a short foot-stalk.

There is another with long spikes of red flowers, which grows naturally in the same countries, whose stalks rise higher; the spikes of flowers are thicker; the lobes of the leaves are broader, and are whiter on their under side; but whether this is a distinct species, or an accidental variety of the fourth, I cannot as yet determine.

All these sorts are very hardy perennial plants, and will thrive in almost any soil or situation. They may be propagated either by seeds or parting of the roots; if they are propagated by seeds, they should be sown in the autumn, for when they are sown in the spring, they seldom grow the same year. When the plants come up, they must be kept clean from weeds till they are strong enough to transplant, when they may be planted in a shady border at about six inches distance each way, observing to water them till they have taken new root; after which they will require no other care but to keep them clear from weeds till autumn, when they may be transplanted to the place where they are to remain; the following summer they will produce flowers and seeds, but their roots will abide many years.

If the roots are parted, it should be done in autumn, that they may get good root before the dry weather comes on in the spring.

The other sorts of Burnet are referred to the article POTERIUM.

SANICULA. Tourn. Inst. R. H. 326. tab. 173. Sanicle.

The Characters are,

It is a plant with an umbellated flower. The universal umbel hath but few rays; the involucre is situated but half round on the outside; the partial umbels have many clustered rays, and their involucre surround them on every side; the flowers have five compressed petals, which are bifid, and turn inward; they have five erect stamina, which are twice the length of the petals, terminated by roundish summits, and a bristly germen, situated under the flower, supporting two awl-shaped styles, which are reflexed. The germen afterward becomes a rough oval pointed fruit, dividing into two parts, each containing one seed.

There is but one Species of this plant at present in England, viz.

SANICULA officinarum. C. B. P. Sanicle, or Self-heal.

This plant is found wild in woods and shady places in several parts of England, but being a medicinal plant, may be propagated in gardens for use. It may be increased by parting the roots any time from September to March, but it is best to do it in autumn, that the plants may be well rooted before the dry weather in spring comes on; they should have a moist soil and a shady situation, in which they will thrive exceedingly.

SANTOLINA. Tourn. Inst. R. H. 460. tab. 260. Lavender-cotton.

The Characters are,

It hath a compound flower with a scaly hemispherical empalement. The flower is uniform, composed of many funnel-shaped hermaphrodite florets, which are longer than the empalement, cut into five parts at the top, which turn backward; they have five very short hair-like stamina, terminated by cylindrical summits, and an oblong four-cornered germen, supporting a slender style, crowned by two oblong, depressed, torn stigmas. The germen afterward becomes a single, oblong, four-cornered seed, which is either naked or crowned with very short down, ripening in the common empalement.

The Species are,

1. *SANTOLINA pedunculis unifloris, foliis quadrifariam dentatis*. Hort. Cliff. 397. Lavender-cotton with one flower upon a foot-stalk, and leaves indented four ways; or common Lavender-cotton.

2. *SANTOLINA pedunculis unifloris, calycibus globosis, foliis quadrifariam dentatis tomentosis*. Lavender-cotton with one flower upon a foot-stalk, globular empalements, and woolly leaves, which are indented four ways.

3. *SANTOLINA pedunculis unifloris, caulibus decumbentibus, foliis linearibus quadrifariam dentatis*. Lavender-cotton with one flower upon a foot-stalk, declining stalks, and linear leaves, which are four ways indented.

4. *SANTOLINA pedunculis unifloris, foliis linearibus longissimis bifariam dentatis*. Lavender-cotton with one flower upon a foot-stalk, and very long linear leaves, which are two ways indented.

5. *SANTOLINA pedunculis unifloris, capitulis globosis, foliis linearibus integerrimis*. Lavender-cotton with one flower upon a foot-stalk, globular heads, and linear entire leaves.

6. *SANTOLINA pedunculis unifloris, foliis linearibus confertis obtusis*. Lavender-cotton with one flower upon a foot-stalk, and linear obtuse leaves growing in clusters.

7. *SANTOLINA pedunculis unifloris, foliis longioribus tomentosis, duplicato dentatis*. Lavender-cotton with one flower upon a foot-stalk, and longer woolly leaves, which are twice indented.

8. *SANTOLINA corymbis simplicibus coarctatis, foliis pinnatifidis dentatis*. Lin. Sp. 842. tab. 227. fig. 1. Lavender-cotton with single corymbuses of flowers, which are closed together at the top, and wing-pointed indented leaves.

9. *SANTOLINA corymbis simplicibus fastigiatis, foliis trilobis cuneiformibus.* *Lin. Sp. Plant.* 843. Lavender-cotton with single corymbuses of flowers, which are closed together at the top, and leaves having three wedge-shaped lobes.

10. *SANTOLINA corymbis simplicibus fastigiatis, foliis semitridis linearibus.* *Lin. Sp. Plant.* 843. Lavender-cotton with single corymbuses, which are closed together at the top, and linear leaves half divided into three points.

11. *SANTOLINA corymbis compositis fastigiatis, foliis inferioribus linearibus dentatis superioribus ovatis serratis.* *Hort. Cliff.* 398. Lavender-cotton with compound corymbuses, which are closed together at the top, the under leaves linear and indented, and the upper oval and sawed.

The first sort is the common Lavender-cotton, which has been long known in the *English* gardens; it was formerly titled *Abrotanum fœmina*, or female Southernwood, and by the corruption of words was called *Brotany* by the market people; it grows naturally in *Spain, Italy*, and the warm parts of *Europe*. This hath a ligneous stalk dividing into many branches, garnished with slender hoary leaves, that are four ways indented, and have a rank strong odour when handled. The branches are terminated by a single flower, composed of many hermaphrodite florets, which are fistular, cut into five parts at the top, of a sulphur colour, and are included in one common scaly empalement, having no borders or rays. These are succeeded by small, oblong, striated seeds, which are separated by scaly chaff, and ripen in the empalement; the plants love a dry soil and a sheltered situation. The leaves, and sometimes the flowers, are used in medicine, and are reputed good to destroy worms.

The second sort has a shrubby stalk, which branches out like the former, but the plants seldom grow so tall. The branches are garnished very closely below with leaves shaped like those of the other sort, but shorter, thicker, and whiter; the flowers are much larger, and the brims of the florets are more reflexed; they are of a deeper sulphur colour than the other. It grows naturally in *Spain*.

The third sort is of lower stature than either of the former, seldom rising more than fifteen or sixteen inches high. The branches spread horizontally near the ground, and are garnished with shorter leaves than either of the former, which are hoary, and finely indented; the stalks are terminated by single flowers of a bright yellow colour, which are larger than those of the first sort.

The fourth sort rises higher than either of the former. The branches are more diffused; they are slender, smooth, and garnished with very narrow long leaves, which are of a deep green colour, but two ways indented; the stalks are slender, naked toward the top, and terminated by single flowers of a gold colour.

The fifth sort hath shrubby stalks, which rise about three feet high, sending out long slender branches, garnished with single linear leaves, of a pale green colour. The stalks are terminated by large, single, globular flowers, of a pale sulphur colour.

The sixth sort is somewhat like the fifth, but the branches are shorter, thicker, and closer garnished with leaves, which come out in clusters. The flower-stalks are sparsely disposed, and have leaves to their top; the flowers are small, and of a yellow colour.

The seventh sort hath shrubby stalks, which rise three feet high, garnished with broader leaves than either of the former, whose indentures are looser but double; they are hoary, and when bruised have an odour like *Chamomile*. The leaves are placed pretty far asunder, and the stalks are garnished with them to the top. The stalks are divided likewise at the top into two or three foot stalks, each sustaining one pretty large sulphur-coloured flower.

The eighth sort is an annual plant, which grows natu-

rally in the *Mediterranean*. This rises with herbaceous slender stalks one foot high, which are hoary, sending out branches, which diminish in their length to the top; these are garnished with wing-pointed leaves, which are in clusters; they have an agreeable odour when bruised. The branches are terminated by clusters of flowers, of a bright yellow colour.

The ninth sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk five or six feet high, sending out slender branches, garnished with short flat leaves, cut into three parts at the top, of a gray colour, and sit close to the branches. The flowers are disposed in a single corymbus at the end of the branches, and are very closely connected together; they are of a pale sulphur colour, and have roundish scaly empalements.

The tenth sort is also a native of the *Cape of Good Hope*. This hath a shrubby stalk very like the former, but the leaves of this are linear, cut half their length into three points, and sometimes into five. The flowers are like those of the former sort.

The eleventh sort grows naturally at the *Cape of Good Hope*. This hath a low shrubby stalk, dividing into several branches, garnished with two sorts of leaves; those on the lower part are oblong, and cut on their edges into acute points; but the upper are short, stiff, and slightly indented at their ends. The flowers are disposed in a compound corymbus at the end of the branches, of a pale yellow colour.

The first of these plants is cultivated in gardens for medicinal use, and the six next are propagated by the gardeners near *London* for furnishing balconies, and other little places in and near the city, by way of ornament. The seven sorts first mentioned are hardy plants, which will thrive in the open air, provided they are planted in a poor dry soil, for in such ground the plants will be stunted, so will be hard and better able to resist the cold, and will have a better appearance than those which are in rich ground, whose branches will be long and diffused, so by hard rains or strong winds are displaced, and sometimes broken down; whereas, in poor land, they will grow compact, and the plants will continue much longer.

All these plants may be cultivated so as to become ornaments to a garden, particularly in small bosquets of evergreen shrubs, where, if these are artfully intermixed with other plants of the same growth, and placed in the front line, they will make an agreeable variety, especially if care be taken to trim them twice in a summer to keep them within bounds, otherwise their branches are apt to straggle, and in wet weather to be borne down and displaced, which renders them unsightly; but, when they are kept in order, their hoary and different-coloured leaves will have a pretty effect in such plantations.

They may be propagated by planting slips or cuttings during the spring, in a border of light fresh earth, but must be watered and shaded in hot dry weather until they have taken root; after which they will require no farther care, but to keep them clear from weeds till autumn, when they should be transplanted where they are designed to remain; but, if the ground is not ready by that time to receive them, it will be proper to let them remain in the border until spring, for if they are transplanted late in autumn, they are liable to be destroyed by cold in winter.

The eighth sort is an annual plant, so is propagated only by seeds, which must be sown the latter end of *March* upon a moderate bed, and when the plants appear, they should be treated in the same way as the *Balsamine*, and other hardy kinds of annuals; the latter end of *May* they should be transplanted into a warm border of light earth, where they will flower, and in warm seasons will perfect their seeds.

The other kinds are too tender to live through the winter in the open air in *England*, so they are kept in pots, and removed into the green-house in autumn; but, as these only require protection from hard frost, so they must not be treated too tenderly, for then their branches will be weak and unlightly, therefore they should be placed with the more hardy exotick plants, where they may have a large share of air whenever the season is mild. These are easily propagated by planting cuttings any time in summer, which must be shaded till they have taken root.

SAPINDUS. *Tourn. Inst. R. H.* 659. *tab.* 440. The Sopeberry-tree.

The Characters are,

The empalement of the flower is composed of four plain, oval, coloured leaves. The flower has four oval petals, which are less than the empalement; it has eight stamina, which are the length of the petals, terminated by erect summits, and an oval germen with three or four lobes, supporting a short style, crowned by a single stigma. The germen afterward becomes one, two, or three globular berries, including nuts of the same form. There is rarely above one of these pregnant, the other are abortive.

The Species are,

1. SAPINDUS *foliis pinnatis decurrentibus*. Sopeberry-tree with winged running leaves.

2. SAPINDUS *foliis pinnatis*. Sopeberry-tree with winged leaves.

The first sort grows naturally in the islands of the *West-Indies*, where it rises with a woody stalk from twenty to thirty feet high, sending out many branches, garnished with winged leaves, composed of several pair of spear-shaped lobes. The midrib has a membranaceous or leafy border running on each side from one pair of lobes to the other, which is broadest in the middle between the lobes; the flowers are produced in loose spikes at the end of the branches; they are small and white, so make no great appearance. These are succeeded by oval berries as large as middling Cherries, sometimes single, at others two, three, or four are joined together; these have a saponaceous skin or cover, which incloses a very smooth roundish nut of the same form, of a shining black when ripe. The skin or pulp which surrounds the nuts, is used in *America* to wash linen, but it is very apt to burn and destroy it, if often used, being of a very acrid nature.

The second sort grows in *India*. This hath a strong woody stalk, which rises about twenty feet high, sending out many strong ligneous branches, covered with a smooth gray bark, and garnished with winged leaves, composed of many spear-shaped lobes; they are of a pale green, and sit close to the midrib, which has no border or wing like the other. The end of the branches are divided into two or three foot-stalks, each sustaining a loose spike of flowers like those of the other sort; these are succeeded by roundish berries like those of the former.

These plants are propagated by seeds; they must be put into small pots, and plunged into a hot-bed of tanners bark. In five or six weeks the plants will appear, when the glasses of the hot-bed should be raised every day in warm weather, to admit fresh air to the plants. In three weeks or a month after the plants appear, they will be fit to transplant, when they must be shaken out of the pots, and carefully parted, so as not to injure their roots, and each planted into a separate small pot, and plunged into the hot-bed again, observing to shade them from the sun until they have taken new root; after which time they must have free air admitted to them every day when the weather is warm, and will require to be frequently watered.

After the plants are well rooted, they will make great progress, especially the second sort, so should be inured to bear the open air by degrees, for this will live in a green-

house in winter, and in summer may be exposed in the open air; but the first is not so hardy, so must be treated more tenderly. I have frequently raised these plants from seeds to the height of two feet in one summer, and the leaves have been a foot and a half in length, so that they made a fine appearance; but these did not survive the winter, whereas those which were exposed to the open air in *July*, and thereby stinted in their growth, continued their leaves fresh all the winter. These were placed in a stove upon shelves, where the warmth was very moderate, with which these plants will thrive better than in a greater heat.

SAPONARIA. *Lin. Gen. Plant.* 449. Sopewort.

The Characters are,

The flower has a permanent empalement of one leaf, which is cut into five points. It has five petals, whose tails are narrow, and the length of the empalement; their borders are broad, obtuse, and plain. It has ten awl-shaped stamina, which are alternately inserted into the petals, and are terminated by obtuse prostrate summits, and a taper germen, supporting two erect parallel styles, crowned by acute stigmas. The germen afterward becomes a close capsule the length of the empalement, having one cell, filled with small seeds.

The Species are,

1. SAPONARIA *calycibus cylindricis, foliis ovato-lanceolatis*. *Hort. Cliff.* 165. Sopewort with cylindrical empalements, and oval spear-shaped leaves; vulgarly called Sopewort.

2. SAPONARIA *calycibus cylindricis, foliis ovatis nervosis semiamplexicaulibus*. Sopewort with cylindrical empalements, and oval veined leaves, half embracing the stalks.

3. SAPONARIA *calycibus pyramidatis quinquangularibus, foliis oblongo-ovatis acuminatis*. Sopewort with pyramidal five-cornered empalements, and oblong, oval, acute-pointed leaves.

4. SAPONARIA *calycibus pyramidatis quinquangularibus, foliis ovato-lanceolatis, semiamplexicaulibus*. Sopewort with pyramidal five-cornered empalements, and oval spear-shaped leaves, half embracing the stalks.

5. SAPONARIA *calycibus cylindricis villosis, caule dichotomo erecto patulo*. *Hort. Upsal.* 106. Sopewort with cylindrical hairy empalements, and erect spreading stalks, which are divided by pairs.

The first sort is the common Sopewort of the shops; this grows naturally in many parts of *England*, and is rarely admitted into gardens; it has a creeping root, so as in a short time to fill a large space of ground, from which arise many purplish stalks about two feet high, which are jointed, garnished with opposite leaves at each; these are oval, spear-shaped, smooth, and of a pale green. The foot-stalks of the flowers arise from the wings of the leaves opposite; they sustain four, five, or more purple flowers each, which have generally two small leaves placed under them. The stalk is also terminated by a loose bunch of flowers, growing in form of an umbel; they have each a large swelling cylindrical empalement, and five broad obtuse petals, which spread open, of a purple colour. These are succeeded by oval capsules with one cell, filled with small seeds.

The decoction of this plant is used to cleanse and scour woollen cloths: the poor people in some countries used it instead of sope for washing, from whence it had its title.

There is a variety of this with double flowers, which is preserved in gardens, but the roots are very apt to spread, if they are not confined, so these plants should not be placed in borders among better flowers; but as the flowers continue in succession from *July* to the middle of *September*, so a few of the plants may be allowed a place in some abject part of the garden, for they will thrive in any situation, and propagate fast enough by their creeping roots.

The second sort was found growing in a wood near *Lichbarrow* in *Northamptonshire*, by *Mr. Gerard*. It has been

generally esteemed a *Lufus Naturæ*, and not a distinct species, but I have never found it alter in forty years; but as it doth not produce seeds, so there is no certainty of its being a distinct species. The roots of this do not spread like those of the first; the stalks are shorter, thicker, and do not grow so erect; they rise a foot high; the joints are very near and swelling; the leaves are produced singly on the lower part of their stalks, but toward the top they are often placed by pairs; they are oval-shaped, and hollowed like a ladle. The flowers are disposed loosely on the top of the stalk; they have large cylindrical empalements, and are of a purple colour. This plant is preserved for the sake of variety in some gardens, but as there is little beauty in the flowers, it does not merit a place in gardens for pleasure. It is easily propagated by parting of the roots in autumn, and loves a moist shady situation.

The third sort is an annual plant, which grows naturally among Corn in the south of *France* and *Italy*. This rises with an upright stalk a foot and a half high, branching out into several divisions by pairs opposite, as are also the leaves; they sit close to the stalks, are smooth, and of a gray colour. The flowers are produced at the end of the branches, each standing upon a long naked foot-stalk; their empalements are large, swelling, and pyramidal, having five acute corners or angles; the petals are but small; they have long necks or tails, which are narrow; their upper part is obtuse, and of a reddish purple colour.

The fourth sort grows naturally in *Spain*. This is also an annual plant; it rises with a strong smooth stalk about two feet high, garnished with oval spear-shaped leaves, which are fleshy, of a gray colour, and very smooth; these half embrace the stalks with their base; the upper part of the stalk divides into branches, which are again subdivided into long naked foot-stalks, each sustaining a single flower; the empalement of the flower is large, pyramidal, and swelling, having five acute angles. The flowers are composed of five obtuse red petals, which spread open above the empalement.

The fifth sort grows naturally in the *Lewant*. This is a low annual plant, seldom rising more than four inches high, but divides into branches by pairs from the bottom, which spread asunder. The leaves are very small; the flowers come out single from the wings of the leaves; they have hairy cylindrical empalements, out of which the petals of the flower do but just peep, so are not obvious at any distance. The whole plant is very clammy to the touch. As this plant makes no figure, so it is only kept for variety.

These plants are easily propagated by seeds, which should be sown where the plants are to remain, and will require no other care but to keep them clean from weeds, and thin them where they are too close. If the seeds are sown in autumn, or are permitted to scatter, the plants will come up without care.

SAPOTA. *Plum. Nov. Gen. 43. tab. 4.* The Mammee Sapota.

The Characters are,

The flower has a permanent empalement, composed of five oval acute-pointed leaves. It has five roundish heart-shaped petals, connected at their base, ending in acute points; and five short stamina the length of the tube, terminated by arrow-pointed summits, with an oval germen, supporting a short style, crowned by an obtuse stigma. The germen afterward becomes an oval succulent fruit, inclosing one or two oval hard nuts or stones.

The Species are,

1. SAPOTA foliis oblongo-ovatis, fructibus turbinatis glabris. Sapota with oblong oval leaves, and smooth turbinated fruit.

2. SAPOTA foliis lanceolatis, fructu maximo ovato, seminibus ovatis utrinque acutis. Sapota with spear-shaped leaves, a

very large oval fruit, and oval seeds, which are pointed at both ends.

The name of Sapota is what these fruit are called by the natives of *America*, to which some add the appellation of Mammee; but there is no other name given to these fruits by the *English*, since they have settled in the *West-Indies*, so far as I can learn.

The first of these trees is common about *Panama*, and some other places in the *Spanish West-Indies*, but is not to be found in any of the *English* settlements in *America*.

The second sort is very common in *Jamaica*, *Barbadoes*, and most of the islands in the *West-Indies*, where the trees are planted in gardens for their fruit, which is by many persons greatly esteemed.

This sort grows in *America* to the height of thirty-five or forty feet, having a strait trunk, covered with an Ash-coloured bark. The branches are produced on every side, so as to form a regular head, and are beset with leaves a foot in length, and near three inches broad in the middle. The flowers which are produced from the branches, are of a cream colour; when these fall away, they are succeeded by large oval or top-shaped fruit, which are covered with a brownish skin, under which is a thick pulp of a Russet colour, very luscious, called Natural Marmalade, from its likeness to Marmalade of Quinces.

As these trees are natives of very warm countries, they cannot be preserved in *England*, unless they are placed in the warmest stoves, and managed with great care. They are propagated by planting the stones; but as these will not keep good long out of the ground, the surest method to obtain these plants is, to have the stones planted in tubs of earth as soon as they are taken out of the fruit, and the tubs placed in a situation where they may have the morning sun, and kept be duly watered. When the plants come up, they must be secured from the vermin, and kept clear from weeds, but should remain in the country till they are about a foot high, when they may be shipped for *England*; but they should be brought over in the summer season, and, if possible, time enough for the plants to make good roots after they arrive. During their passage, they must have some water, while they continue in a warm climate; but as they come into colder weather, they should have very little moisture, and must be secured from salt water, which will soon destroy the plants if it gets at them.

When these plants arrive in *England*, they should be carefully taken out of the tubs, preserving some earth to their roots, and planted into pots, and then plunged into a moderate hot-bed of tanners bark, observing, if the weather is hot, to shade the glasses with mats, to screen the plants from the sun, until they have taken new root; observing also, not to water them too much at first, especially if the earth in which they come over is moist, because too much water is very injurious to the plants before they are well rooted, but afterward they must be frequently refreshed with water in warm weather, and must have a large share of air admitted to them, otherwise their leaves will be infested with insects, and become foul; in which case they must be washed with a sponge to clean them, without which the plants will not thrive.

In the winter these plants must be placed in the warmest stove, and in cold weather they should have but little water given to them. As these plants grow in magnitude, they should be shifted into pots of a larger size, but they must not be over-potted, for that will infallibly destroy them.

SARRACENA. *Tourn. Inst. R. H. 657. tab. 476.* The Sidesaddle Flower.

The Characters are,

The flower has a double empalement; the under is composed of three leaves, which fall away; the upper has five coloured leaves, which

which are permanent. It has five oval inflexed petals which inclose the stamina, whose tails are oblong, oval, and erect, and a great number of small stamina, terminated by target-shaped summits. In the center is situated a roundish germen, supporting a short cylindrical style, crowned by a target-shaped five-cornered stigma covering the stamina, and is permanent. The germen afterward becomes a roundish capsule with five cells, filled with small seeds.

The Species are,

1. *SARRACENA foliis gibbis*. Hort. Cliff. 427. *Sarracena* with gibbous leaves.

2. *SARRACENA foliis strictis*. Lin. Sp. Plant. 510. *Sarracena* with closed leaves.

The first sort grows naturally upon bogs in most parts of North America. This hath a strong fibrous root, which strikes deep into the soft earth, from which arise five, six, or seven leaves, in proportion to the strength of the plant; these are hollow like a pitcher, narrow at their base, but swell out large at the top; their outer sides are rounded, but on their inner they are a little compressed, and have a broad leafy border running longitudinally the whole length of the tube; and to the rounded part of the leaf there is on the top a large appendage or ear standing erect, of a brownish colour; this surrounds the outside of the leaves about two-thirds of the top. From the center of the root, between the leaves, arises a strong, round, naked foot-stalk about a foot high, sustaining one nodding flower at the top, which has a double empalement; the outer one is of one leaf, divided into five parts to the bottom, where they are connected to the foot-stalks; these segments are obtuse, and bend over the flower, so as to cover the inside of it; they are of a purple colour on the outside, but green within, having purple edges; the inner empalement, which is composed of three green leaves, falls off; within these are five oval petals of a purple colour, which are hollowed like a spoon; these cover the stamina and summits, with part of the stigma also. In the center is situated a large, roundish, channelled germen, supporting a short style, crowned by a very broad five-cornered stigma, fastened in the middle to the style, covering the stamina like a target; this is green, but the five corners which are stretched out beyond the brim are each cut into two points, and are purplish. Round the germen are situated a great number of short stamina, joining the sides of the germen closely, which are terminated by target-shaped furrowed summits, of a pale sulphur colour. When the flower decays, the germen swells to a large roundish capsule with five cells, covered by the permanent stigma, filled with small seeds.

The second sort grows naturally in Carolina, upon bogs and in standing shallow waters. The leaves of this sort grow near three feet high, small at the bottom, but widening gradually to the top. They are hollow, and arched over at the mouth like a friar's cowl. The flowers of this grow on naked pedicles, rising from the root to the height of three feet; the flowers are green.

These plants are esteemed for the single structure of their leaves and flowers, which are so different from all the known plants, as to have little resemblance of any yet discovered, but there is some difficulty in getting them to thrive in England, when they are obtained from abroad; for as they grow naturally on bogs, or in shallow standing waters, so unless they are constantly kept in wet, they will not thrive; and although the winters are very sharp in the countries where the first sort naturally grows, yet being covered with water, and the remains of decayed plants, they are defended from frost.

The best method to obtain these plants is, to procure them from the places of their natural growth, and to have them taken up with large balls of earth to their roots, and

planted in tubs of earth, which must be sometimes watered during their passage, otherwise they will decay before they arrive; for there is little probability of raising these plants from seeds, so as to produce flowers in many years, if the seeds do grow, so that young plants should be taken up to bring over, which are more likely to stand here than those which have flowered two or three times. When the plants are brought over, they should be planted in pots, which should be filled with soft spongy earth, mixed with rotten wood, moss, and turf, which is very like the natural soil in which they grow. These pots should be put into larger pots which will hold water, with which they must be constantly supplied, and placed in a shady situation in summer; but in the winter they must be covered with moss, or sheltered under a frame, otherwise they will not live in this country, for as the plants must be kept in pots, so if these are exposed to the frost, it will soon penetrate through them, and greatly injure, if not destroy, the plants; but when they are placed under a common frame, where they may have the open air at all times in mild weather, and be sheltered from hard frost, the plants will thrive and flower very well.

SASSAFRAS. See *Laurus*.

SATUREJA. *Tourn. Inst. R. H.* 197. Savory.

The Characters are,

The flower hath an erect, tubulous, striated empalement of one leaf, indented at the brim in five points; it hath one ringent petal, whose tube is cylindrical and shorter than the empalement; the chaps are single, the upper lip erect and obtuse, having an acute indenture at the point. The under lip is spreading, divided into three equal parts. It has four bristly stamina, two of which are almost the length of the upper lip; the other two are shorter, terminated by summits which touch each other, and a four-pointed germen, supporting a bristly style, crowned by two bristly stigmas. The germen afterward becomes four seeds, which ripen in the empalement.

The Species are,

1. *SATUREJA pedunculis bifloris*. Vir. Cliff. 87. Savory with two flowers upon each foot-stalk; or Summer Savory.

2. *SATUREJA floribus verticillatis, foliis ovatis acutis*. Fler. Leyd. Prod. 324. Savory with whorled flowers, and oval acute-pointed leaves; or the true Thymbra.

3. *SATUREJA pedunculis dichotomis lateralibus solitariis, foliis mucronatis*. Lin. Sp. Plant. 568. Savory with single diverging foot-stalks on the sides of the branches, and sharp-pointed leaves; or Winter Savory.

4. *SATUREJA capitulis terminalibus, foliis lanceolatis*. Lin. Sp. Plant. 567. Savory with heads of flowers terminating the stalks, and spear-shaped leaves.

5. *SATUREJA foliis ovatis serratis, corymbis terminalibus dichotomis*. Lin. Sp. Plant. 568. Savory with oval sawed leaves, and flowers growing in a divided corymbus, terminating the stalks.

6. *SATUREJA verticillis lanuginosis, dentibus calycinis setaceis pilosis*. Hort. Cliff. 306. Savory with woolly whorls of flowers, whose indentures of their empalements are brittle and hairy; commonly called Mastick Thyme.

7. *SATUREJA verticillis fastigiatis concatenatis, foliis linearilanceolatis*. Lin. Sp. Plant. 567. Savory with bunched whorls of flowers, and linear spear-shaped leaves; Julian's Thymbra, or the true Savory.

8. *SATUREJA pedunculis corymbosis, lateralibus geminis, bracteis calyce brevioribus*. Lin. Sp. Plant. 568. Savory with corymbuses of flowers growing by pairs from the wings of the leaves, and bractæ shorter than the empalements.

9. *SATUREJA floribus spicatis, foliis carinatis punctatis ciliatis*. Lin. Mat. Med. 283. Savory with spiked flowers, and keel-shaped hairy leaves, having spots.

The first fort is generally known in the gardens, by the title of Summer Savory. It is an annual plant, which grows naturally in the south of *France* and *Italy*, but is cultivated in the *English* gardens for the kitchen, and also for medicinal use. It rises with slender erect stalks a foot high, sending out branches by pairs, garnished with leaves placed opposite; they are stiff, a little hairy, and have an aromattick odour if rubbed. The flowers grow from the wings of the leaves toward the upper part of the branches, each foot-stalk sustaining two flowers, of the lip kind, having a short cylindrical tube; the upper lip is erect, and indented at the point; the lower is divided into three almost equal parts; they are of a pale flesh colour, and are succeeded by seeds, which ripen in autumn.

The second fort grows naturally in *Crete*. This rises with a shrubby stalk two feet high, dividing into several slender ligneous branches, garnished with small stiff oval leaves, ending in acute points, of an aromattick odour when bruised. The flowers grow in thick whorls round the stalks toward the top; they have short, hairy, five-pointed empalements; the flower is shaped like that of the former, but is larger, and of a brighter red colour. This plant rarely ripens its seeds in *England*.

The third fort is well known in the gardens by the title of Winter Savory. It is a perennial plant, which grows naturally in the south of *France* and *Italy*, but is here cultivated in gardens both for food and physick. This hath a shrubby, low, branching stalk a foot high, garnished with two very narrow leaves at each joint, which are stiff, and stand opposite; from the base of these come out a few small leaves in clusters. The flowers grow from the wings of the leaves upon short foot stalks; they are shaped like those of the first fort, but are larger, and of a paler colour, and are succeeded by seeds, which ripen in autumn; but the plants will continue several years, especially if they are planted on a poor dry soil.

The fourth fort grows naturally in *North America*. This hath a perennial root; the stalk rises about a foot and a half high; it is stiff, angular, and branches out toward the top. The leaves are stiff, spear-shaped, pointed, and have a strong scent of Pennyroyal; the stalks are terminated by white flowers, collected into globular heads. These are seldom succeeded by perfect seeds in *England*.

The sixth fort grows naturally in *Spain*, and is known in the *English* gardens by the title of Herb Mastick, or Mastick Thyme. This hath a shrubby branching stalk a foot and a half high, covered with a brown bark: the branches are slender, but ligneous, garnished with leaves like those of Thyme, but a little larger. The flowers grow in roundish whorls toward the top of the branches, which have a down about them, whereby the plant is easily distinguished from all the other of this tribe. The flowers are small, white, and stand in hairy bristly empalements; the whole plant has a very grateful odour. It does not produce seeds here.

There is another variety of this (if not a distinct species) which has weaker branches, smaller hairy leaves, and very small hairy whorls of flowers, but not woolly like the former. The seeds of this were sent me from *Spain*, but I have not had trial enough yet of the plants, to determine if it is really different from the other.

The seventh fort grows naturally in *Spain* and some parts of *Italy*. It hath very slender ligneous stalks, which grow erect nine inches high, sending out two or three slender side branches toward the bottom, garnished with narrow, spear-shaped, stiff leaves, which are placed opposite. The flowers grow in whorls above each other for more than half the length of the stalk, and seem as if they were bundled together. They are small and white, but the seeds seldom ripen here; the whole plant has a pleasant aromattick scent.

The eighth fort grows naturally in *Crete*. This hath very slender ligneous stalks a foot and a half high, garnished with small, oval, stiff, acute-pointed leaves, whose borders are reflexed. The flowers grow in roundish whorls upon short foot-stalks, which rise by pairs from the wings of the leaves; they are small and white, and if the season proves warm, the seeds will ripen in autumn.

The ninth fort grows naturally in *Crete*. It has a low shrubby stalk, with branches on every side, and are hoary, garnished with stiff, narrow, acute pointed leaves, which are hollowed like the keel of a boat. The flowers grow in short roundish spikes at the end of the branches; they are small and white; the whole plant is hoary, and very aromattick. This never produces seeds in *England*.

The first fort is only cultivated by seeds; these should be sown the beginning of *April* upon a bed of light earth, either where they are to remain, or for transplanting; if the plants are to stand unremoved, the seeds should be sown thinly, but if they are to be transplanted, they may be sown closer. When the plants appear, they must be kept clean from weeds, and afterward they may be treated in the same way as Marjoram.

The second, seventh, and ninth forts, are too tender to live through the winter in the open air in *England*. These are generally propagated by slips or cuttings, which take root very readily during any of the summer months; if these cuttings or slips are planted in a shady border, or are shaded from the sun with mats, they will put out roots in two months, fit to be transplanted, when they should be each transplanted into a small pot, and placed in the shade till they have taken new root; then they may be placed in a sheltered situation, where they may remain till the end of *October*; then they should be placed under a common hot-bed frame, where they may be exposed to the open air, at all times when the weather is mild; but they must be protected from hard frost, which will destroy them.

As these plants seldom live above three or four years, so there should be a supply of young plants raised to preserve the species, otherwise they may be soon lost. In winter they should not have much wet, for they are very subject to grow mouldy by moisture, but especially if the free air is excluded from them, or if their branches are drawn up weak, they soon decay.

The third fort is very hardy, so if this is sown or planted upon a dry lean soil, it will endure the greatest cold of our winters. I have seen some of the plants growing upon the top of an old wall, where they were fully exposed to the cold, and these survived severe frost, when most of those which were growing in the ground were destroyed. This may be propagated either by seeds in the same way as the first, or by slips, which, if planted in the spring, will take root very freely. These plants will last several years, but when they are old, their shoots will be short and not so well furnished with leaves, so will not be so good for use as young plants, therefore it will be proper to raise a supply of young plants every other year.

The fifth fort has a perennial root, but the stalks decay every autumn. There are two varieties of this, one of them has narrow leaves and larger heads than the other, and the leaves have very little scent; whereas those of the common fort smell so like Pennyroyal, as not to be distinguished by those who do not see the plants. This fort sometimes produces good seeds here, from which the plants may be easily propagated; they may also be increased by planting cuttings in the spring, in the same manner as is practised for Mint; these will take root freely, and if they are afterwards planted in a moist soil, they will thrive exceedingly; but as the plant is never used here, so it is only kept for variety in some curious gardens.

The eighth sort is annual, and so tender as rarely to perfect its seeds here, so that there is great difficulty to preserve it. The cuttings or slips of this will take root, by which the plant may be continued two or three years; but these must be sheltered in winter under a frame and kept dry, for wet at that season will soon destroy them.

SATYRIUM. *Lin. Gen. Plant.* 901.

The Characters are,

It hath a single stalk; the flowers have no empalement, but sit upon the germen: they have five oblong oval petals, three outer and two inner, joined in a helmet; they have a one-leaved nectarium, situated on the side between the division of the petals. The upper lip is short and erect, the under is plain and hangs downward; their base represents the hinder part of the scrotum. They have two short slender stamina sitting upon the pointal, having oval summits, with double cells shut up in the upper lip of the nectarium, and an oblong twisted germen situated under the flower, having a short style growing on the upper lip of the nectarium, crowned by an obtuse compressed stigma. The germen afterward becomes an oblong capsule with one cell, having three keels and three cells, opening under the keels three ways, filled with small seeds.

The Species are,

1. SATYRIUM *bulbis palmatis, foliis linearibus, nectarii labio resupinato trilobo, intermedia majore. Aët. Upsal.* 1740. p. 19. Satyrium with handed bulbs, linear leaves, and the under lip of the nectarium with three lobes, the middle being the largest.

2. SATYRIUM *bulbis indivisis, foliis lanceolatis, nectarii labio trifido, intermedia lineari, obliqua præmorsa. Aët. Upsal.* 1740. tab. 18. Satyrium with an undivided bulb, spear-shaped leaves, and the lip of the nectarium trifid, the middle segment being linear and obliquely bitten; the Lizard Flower, or great Goatstones.

3. SATYRIUM *bulbis palmatis, foliis oblongis obtusis, nectarii labio lineari trifido, intermedia obsoleta. Aët. Upsal.* 1740. p. 18. Satyrium with handed bulbs, oblong blunt leaves, and the lip of the nectarium divided into three linear parts, the middle one being obsolete; by some called the Frog Orchis.

4. SATYRIUM *bulbis fasciculatis, foliis lanceolatis, nectarii labio trifido acuto, intermedia majore. Aët. Upsal.* 1740. Satyrium with clustered bulbs, spear-shaped leaves, and the lip of the nectarium divided into three acute parts, the middle one being the largest.

The first sort grows naturally upon the *Alps*. This has a broad handed bulbous root; the stalk rises nine inches high, garnished with very narrow leaves; those on the lower part are four inches long, but on the upper part they are scarce one inch; their base embraces the stalk. The flowers grow in a thick short spike at the top, of a dark purple colour; the lip of the nectarium has three lobes, the middle one being the largest.

The second sort grows naturally in several parts of *England*. This has a solid bulbous root; the stalk is strong, fifteen inches high; the lower part is garnished with leaves near five inches long, which embrace the stalk with their base. The spike of flowers which occupy the upper part of the stalk, is six inches in length; the flowers are of a dirty white, with some linear stripes and spots of a brown colour; the beard or middle segment of the lip of the nectarium, is two inches long, and appears as if it was obliquely bitten off.

The third sort grows naturally on dry pastures, and upon chalk hills in several parts of *England*. This has a handed bulbous root; the stalk rises a foot high; the lower part is garnished with leaves three inches long and half an inch broad, whose base embraces the stalk. The flowers terminate the stalk in a long slender spike; the nectarium of this

varies in colour, it is sometimes of a dusky purple, and at others of a yellowish green colour.

The fourth sort grows near *Verona*, and upon the *Alps*. This hath several small bulbs, which are joined together; the stalk rises eight inches high; the lower part is garnished with spear-shaped leaves three inches long, which embrace the stalk with their base. The flowers terminate the stalk in a short thick spike, which are of an herbaceous white colour.

All these plants are difficult to propagate, so the best way to obtain them, is to take up their roots at a proper season, and transplant them into the gardens, putting the several sorts into different soils, as near to that in which they naturally grow as possible, and to leave the ground undisturbed; for if their roots are injured, the plants seldom thrive after. The management of this plant being the same as for the Orchis, I shall not repeat it here.

SAVINE. See Juniperus.

SAVORY. See Satureja.

SAURURUS. *Lin. Gen. Plant.* 414. Lizard's-tail.

The Characters are,

The flowers are disposed in a katkin or tail; they have an oblong permanent empalement of one leaf. They have no petal, but have six long hair-like stamina, placed three on each side opposite, terminated by oblong erect summits; and an oval germen with three lobes, having no style, but is crowned by three blunt permanent stigmas. The germen afterward becomes an oval berry with one cell, inclosing one oval seed.

We have but one Species of this genus at present.

the *English* gardens, viz.

SAURURUS *foliis cordatis petiolatis, spicis solitariis recurvis. Hort. Upsal.* 91. Lizard's-tail with heart-shaped leaves, having foot-stalks, and single recurved spikes of flowers.

This plant grows naturally in many parts of *North America*. The root is fibrous and perennial; the stalk rises a foot and a half high, having some longitudinal furrows; the leaves are heart-shaped, smooth, about three inches long, and two broad at their base, ending in obtuse points, standing upon foot-stalks, which are placed alternately. The spike of flowers comes out from the wings of the leaves toward the top of the stalk; it is taper, about two inches long, but make little appearance, and are not succeeded by seeds in *England*. The stalk decays in autumn.

This is preserved by botanists for the sake of variety, but, as it has no beauty, it is very rarely admitted into other gardens; it is propagated by its creeping root, which may be parted either in autumn, soon after the stalks decay, or in the spring, before the roots begin to shoot; it loves a moist soil and a shady situation.

SAXIFRAGA. *Tourn. Inst. R. H.* 252. tab. 129. Saxifrage.

The Characters are,

The flower hath a short permanent acute empalement, cut into five parts; it has five plain petals, and ten awl-shaped stamina, terminated by roundish summits, with a roundish acute-pointed germen, sitting upon two styles, crowned by obtuse stigmas. The germen afterward becomes an oval capsule with two horns opening between their tops, filled with small seeds.

The Species are,

1. SAXIFRAGA *foliis caulinis reniformibus lobatis, caule ramoso, radice granulata. Hort. Cliff.* 167. Saxifrage with kidney-shaped leaves upon the stalks, with lobes, a branching stalk, and roots like grains of Corn; or white Saxifrage.

2. SAXIFRAGA *foliis radicatis aggregatis lingulatis, cartilagineo-ferratis, caule ramoso.* Saxifrage with tongue-shaped leaves at the root, which are joined together, having cartilaginous saws, and a branching stalk.

3. *SAXIFRAGA foliis radicatis aggregatis cuneiformibus cartilagineo-ferratis, caule paniculato.* Saxifrage with the lower leaves wedge-shaped, joined together, with edges having cartilaginous saws, and a paniculated stalk.

4. *SAXIFRAGA foliis radicatis aggregatis lingulatis, cartilagineo-ferratis, caule pyramidato.* Saxifrage with the lower leaves joined together, which are tongue-shaped, having cartilaginous saws, and a pyramidal stalk.

5. *SAXIFRAGA foliis caulinis dentatis reniformibus petiolatis.* *Lin. Sp. Plant.* 403. Saxifrage with kidney-shaped leaves on the stalks, which stand on foot-stalks, and are indented.

6. *SAXIFRAGA foliis reniformibus dentatis, caule nudo paniculato.* *Lin. Sp. Plant.* 401. Saxifrage with indented kidney-shaped leaves, and a naked paniculated stalk.

7. *SAXIFRAGA foliis obovatis dentatis petiolatis, caule nudo paniculato.* *Lin. Sp. Plant.* 399. Saxifrage with oblong, oval, indented leaves, having foot-stalks, and a naked paniculated stalk; commonly called *London Pride*, or *None-so-pretty*.

8. *SAXIFRAGA foliis lanceolatis denticulatis, caule nudo paniculato, floribus sulcapitatis.* *Lin. Sp. Plant.* 401. Saxifrage with spear-shaped indented leaves, a naked paniculated stalk, and flowers collected in heads.

9. *SAXIFRAGA foliis obovatis crenatis subsessilibus, caule nudo, floribus congestis.* *Lin. Sp. Plant.* 401. Saxifrage with oblong, oval, crenated leaves sitting close to the root, a naked stalk, and flowers growing in close bunches.

10. *SAXIFRAGA foliis caulinis linearibus alternis ciliatis, radicalibus aggregatis.* *Lin. Sp. Plant.* 402. Saxifrage with linear leaves on the stalk, which are set with fine hairs alternate, and those at the root joined together.

11. *SAXIFRAGA foliis caulinis ovatis oppositis imbricatis, summis ciliatis.* *Flor. Suec.* 359. Saxifrage with oval leaves on the stalks, which are opposite, and lie over each other, and upper leaves having fine hairs.

12. *SAXIFRAGA foliis caulinis linearibus integris trifidisve, solenibus procumbentibus, caule erecto nudiusculo.* *Lin. Sp. Plant.* 405. Saxifrage with linear leaves on the stalks, which are entire or trifid, trailing side shoots, and erect stalks, which are almost naked; commonly called *Ladies Cushion*.

There are many more species of this genus than are here enumerated, some of which grow naturally in *Great-Britain*; but, as they are very rarely admitted into gardens, it would be needless to mention them in this work.

The first sort is the common white Saxifrage, which grows naturally in the meadows in most parts of *England*. The roots of this plant are like grains of *Corn*, of a reddish colour without, from which arise kidney-shaped hairy leaves, standing upon pretty long foot-stalks. The stalks are thick, a foot high, hairy, and furrowed; these branch out from the bottom, and have a few small leaves like those below, which sit close to the stalk; the flowers terminate the stalk, growing in small clusters; they have five small white petals, inclosing ten stamina and the two styles. The roots and leaves of this plant are used in medicine.

There is a variety of this, which was found wild by *Mr. Joseph Blind*, gardener at *Barns*, who transplanted it into his garden, and afterward distributed it to several curious persons, since which time it hath been multiplied so much, as to become a very common plant in most gardens near *London*, where it is planted in pots to adorn court-yards, &c. in the spring, and is very ornamental at that season in the borders of the flower-garden.

This plant is propagated by offsets, which are sent forth from the old roots in great plenty. The best season for transplanting them is in *July*, after their leaves are decayed, when they must be put into undunged earth, and placed in the shade until autumn; but in winter they may be exposed to the sun, which will cause them to flower somewhat earlier

in the spring. In *April* these plants will flower, and, if they are in large tufts, will make a very handsome appearance; when they are transplanted, they should be put in bunches, that they may produce a greater number of flowers.

The second sort grows naturally on the *Alps*; this hath a perennial fibrous root. The leaves grow in circular heads, embracing each other at their base, after the manner of the common *Houlceek*; they are tongue-shaped, rounded at their points, and have a white cartilaginous sawed border. The stalk rises a foot high, is of a purplish colour, a little hairy, and sends out several horizontal branches. The flowers grow in small clusters at the end of the branches; they are white, and have several small red spots on the inside.

It is easily propagated by offsets, which are sent out in plenty; they may be taken off at almost any season when the weather is mild, and should be planted in a very dry soil and a shady situation.

The third sort grows naturally on the *Alps*. The leaves of this are gathered into circular heads like the former, but are not more than half an inch long, wedge-shaped, the upper part being broad and rounded, but diminish to their base, where they are narrow; their borders are edged, and indented in the same manner as those of the former. The stalk, in the places where the plant grows naturally, seldom rises more than six inches high, but, when transplanted into gardens, is often more than a foot; these have small leaves sitting close to them. The flowers are disposed in loose panicles on the top of the stalks; they are white, spotted with red, and may be propagated in the same manner as the former.

The fourth sort grows naturally on the mountains in *Italy*. The leaves of this are gathered into heads like those of the two former; they are tongue-shaped, rounded at their points, and have cartilaginous sawed borders. The stalk rises two feet and a half high, branching out near the ground, forming a natural pyramid to the top; the flowers have five white wedge-shaped petals, and ten stamina, placed circularly the length of the tube, terminated by roundish purple summits. When these plants are strong, they produce very large pyramids of flowers, which make a fine appearance, so are very ornamental for halls, or to place in chimneys, where, being kept in the shade, and screened from wind and rain, they will continue in beauty much longer, than if kept in the open air.

This plant is easily propagated by offsets, which are put out from the side of the old plants in plenty. They are usually planted in pots filled with light earth, and in the summer season placed in the shade, but in the winter should be exposed to the sun, and all the offsets should be taken off, leaving the plant single, which will cause it to produce a much stronger stem for flowering, for where there are offsets about the old plant, they exhaust the nourishment from it, whereby it is rendered much weaker. These offsets must be each planted in a separate small pot, filled with fresh earth, to succeed the old plants, which generally perish after flowering; these offsets will produce flowers the second year, so there should be annually some of them planted to succeed the others.

The fifth sort grows naturally on the *Helvetian* mountains. This hath a perennial root. The stalk is erect, a foot high, channelled and hairy; it is garnished with kidney-shaped leaves, which are sharply indented; the stalks are terminated by small clusters of flowers, marked with several red spots. It is propagated by parting of the roots; the best time for this is in autumn, that the plants may have good roots before the dry weather in the spring. It loves a shady situation and a loamy soil.

The

The sixth sort grows naturally on the *Alps* and *Pyrenean* mountains. The root is fibrous and perennial; the leaves are thick, kidney-shaped, and crenated on their edges, of a deep green on their upper side, but pale on their under, standing upon long, thick, hairy foot-stalks, which branch into a panicle, sustaining several small white flowers, marked with red spots; the stamina of this are longer than the petals. It propagates very fast by offsets, which should be taken off in autumn, and planted in a shady situation, where they will thrive fast enough.

The seventh sort is known by the titles of *London Pride*, or *None-so-pretty*. It grows naturally on the *Alps*, and also in great plenty upon a mountain called *Mangerton*, in the county of *Kerry* in *Ireland*. The roots of this are perennial; the leaves are oblong, oval, placed circularly at bottom; they have broad, flat, furrowed foot-stalks, and are deeply crenated on their edges, which are white; the stalk rises a foot high, is of a purple colour, stiff, slender, and hairy; it sends out from the side on the upper part several short foot-stalks, which are terminated by white flowers spotted with red; the stamina are longer than the petals of the flower, as are also the two styles; these have red stigmas. It may be propagated in the same way as the former, and loves a shady situation.

The eighth sort grows naturally in *North America*. This is a perennial plant with a fibrous root, from which arise several spear-shaped leaves seven or eight inches long, and two broad, having small indentures on their edges; they are a deep green, and of a thick consistence. The stalk is naked, and rises a foot and a half high, branching at the top in form of a panicle, sustaining very small herbaceous flowers, which are collected into small heads. It is propagated by parting the root; the best time is in autumn; it loves a moist soil and a shady situation, and is never injured by cold.

The ninth sort grows naturally upon some mountains in *Wales*. This hath a fibrous perennial root, from which come out oblong, roundish, indented leaves, deeply indented, or rather sawed on their edges, sitting very close to the root. The stalk rises about five inches high, is naked, and terminated by a close compact cluster of white flowers; if they are planted in a shady situation, they will continue almost a month. This must have a loamy soil, otherwise it will not thrive.

The tenth sort grows naturally upon the *Austrian* mountains. It has also been found growing in plenty in *Knotsford-More* in *Cheeshire*; this is a perennial plant. The leaves are gathered in clusters at the bottom; they are spear-shaped; the stalk rises about six inches high, garnished with narrow leaves the whole length, placed alternately, and sit close to them; the flowers are produced in small clusters at the top of the stalk; they have five yellowish petals, having several red spots on their inside. This plant is difficult to propagate in gardens, for it naturally grows upon bogs, so that unless it is planted in such loose rotten earth, and kept constantly moist, it will not thrive.

The eleventh sort grows naturally upon the *Pyrenean* and *Helvetian* mountains, as also upon *Ingleborough-Hill* in *Yorkshire*, *Snowden* in *Wales*, and other high places in the north of *England*. This is a perennial plant, whose stalks trail upon the ground, and are seldom more than two inches long, garnished with small oval leaves standing opposite, which lie over each other like the scales of fish; they are of a brown green colour, and have a resemblance of *Heath*. The flowers are produced at the end of the branches, of a deep blue, so make a pretty appearance during their continuance, which is great part of *March*, and the beginning of *April*. This is propagated by parting of the roots; the best time for doing it is in autumn: it must have a shady

situation and a moist soil, otherwise it will not thrive in gardens.

The twelfth sort grows naturally upon the *Alps*, *Pyrenees*, and *Helvetian* mountains; it is also found growing plentifully on *Ingleborough-Hill* in *Yorkshire*, *Snowden* in *Wales*, and some other places in the north. This is a perennial plant, whose branches spread flat upon the ground, and put out roots at their joints, garnished with fine soft leaves like moss, some of which are entire, and others cut into three points. The branches join so close together, as to form a soft roundish bunch like a pillow or cushion, from whence some have given it the appellation of *Ladies Cushion*; the flower-stalks rise three or four inches high; they are slender, erect, and have two or three small leaves, some are entire, and others trifid; they are of a bright green colour, and soft to the touch; the flowers grow in small bunches at the top of the stalk; they are small, of a dirty colour, so make no great appearance.

This sort propagates fast enough by its trailing branches, provided it is planted in a moist soil and a shady situation, but it will not thrive in dry ground, or where it is much exposed to the sun. The best time to remove any of these plants is in autumn, that they may have the benefit of the winter's rain to establish them well before the dry weather of the spring comes on, for when they are planted late, they are very subject to die, unless they are supplied with water, and they seldom make any figure the first year.

SCABIOSA. *Tourn. Inst. R. H.* 463. tab. 263 & 264. Scabious.

The Characters are,

The common empalement is composed of many leaves, containing many flowers; it has several series of leaves surrounding the receptacle upon which they sit; the inner are gradually smaller. The flowers have a double empalement, and sit upon the germen; the outer is short, membranaceous, folded, and permanent; the inner is divided into five awl-shaped capillary segments. The florets have one erect tubulous petal, cut into four or five parts at the brim; they have four weak, awl-shaped, hair-like stamina, terminated by oblong prostrate summits. The germen is situated under the receptacle of the florets, supporting a slender style, crowned by an obtuse stigma, which is obliquely indented; it afterward becomes an oblong oval seed sitting in the common empalement, and crowned by the cup of the flower.

The Species are,

1. SCABIOSA *corollulis quadrifidis radiantibus, caule hispido.* Hort. Cliff. 31. Scabious with quadrifid radiated florets, and a rough hairy stalk; or *Meadow Scabious* of the shops.

2. SCABIOSA *corollulis quadrifidis æqualibus, caule simplici, ramis, approximatis, foliis lanceolato-ovatis.* Hort. Cliff. 30. Scabious with quadrifid florets, which are equal, a single stalk, and branches growing near, with spear-shaped oval leaves.

3. SCABIOSA *corollulis quadrifidis æqualibus, squamis calycinis ovatis obtusis.* Lin. Sp. Plant. 98. Scabious with quadrifid florets, which are equal, and the scales of the empalement oval and obtuse.

4. SCABIOSA *corollulis quadrifidis fistulosis æqualibus, squamis calycinis acutis, caule paniculato, foliis rigidis pinnatifidis.* Scabious with quadrifid fistulous florets, which are equal, acute scales to the empalement, a paniculated stalk, and stiff wing-pointed leaves.

5. SCABIOSA *corollulis quadrifidis æqualibus, somnibus longioribus, squamis calycinis acutis, foliis radicalibus lanceolatis integerrimis, caulibus divisis.* Scabious with quadrifid equal florets, longer stamina, acute scales to the empalement, and the lower leaves spear-shaped and entire, but those on the stalks divided.

6. SCABIOSA *corollulis quadrifidis radiantibus, caule hispido, foliis lanceolatis pinnatifidis, foliolis imbricatis.* Lin. Sp. Plant. 99.

Scabious with radiated quadrifid florets, a rough hairy stalk, and spear-shaped wing-pointed leaves, with lobes set over each other in the manner of tiles.

7. *SCABIOSA corollulis quadrifidis æqualibus, calycibus squamosis nitidis obtusis, caule dichotomo, foliis pinnatifidis.* Scabious with equal quadrifid florets, neat scaly empalements, which are obtuse, a stalk divided by pairs, and wing pointed leaves.

8. *SCABIOSA corollulis quadrifidis radiantibus, caule simplici, foliis linearibus tomentosis.* Scabious with radiated quadrifid florets, a single stalk, and linear woolly leaves.

9. *SCABIOSA corollulis quinquefidis æqualibus, caule erecto hispido, foliis lanceolatis denticulatis hirsutis, semi-amplexicaulibus.* Scabious with equal quinquefid florets, an erect stalk, which is rough hairy, and spear-shaped hairy leaves, which are somewhat indented, and half embrace the stalks.

10. *SCABIOSA corollulis quinquefidis, foliis pinnatis serratis, receptaculis florum globosis.* Scabious with quinquefid florets, winged sawed leaves, and globular receptacles to the flower.

11. *SCABIOSA corollulis quinquefidis radiantibus, foliis linearilanceolatis integerrimis, caule suffruticoso.* Scabious with radiated quinquefid florets, linear, spear-shaped, entire leaves, and an under-shrub stalk.

12. *SCABIOSA corollulis quinquefidis, foliis lanceolatis subintegerrimis.* Hort. Cliff. 31. Scabious with quinquefid florets, and spear-shaped leaves, which are almost entire.

13. *SCABIOSA corollulis quinquefidis radiantibus, foliis bipinnatis linearibus.* Lin. Sp. Plant. 101. Scabious with radiated quinquefid florets, and linear doubly-winged leaves.

14. *SCABIOSA corollulis quinquefidis, foliis pinnatis, laciniis lanceolatis, pedunculis nudis lævibus longissimis.* Prod. Leyd. 190. Scabious with quinquefid florets, winged leaves, having spear-shaped segments, and long, naked, smooth foot-stalks.

15. *SCABIOSA corollulis quinquefidis, foliis dissectis, receptaculis florum subulatis.* Hort. Cliff. 31. Scabious with five-pointed florets, cut leaves, and awl-shaped receptacles to the flowers.

16. *SCABIOSA corollulis quinquefidis, foliis dissectis, receptaculis florum subrotundis.* Hort. Cliff. 31. Scabious with five-pointed florets, cut leaves, and roundish receptacles to the flowers.

17. *SCABIOSA corollulis quinquefidis, foliis inferioribus integris crenatis, caulinis inciso-crenatis, caule fruticoso.* Scabious with five-pointed florets, the lower leaves entire and crenated, those upon the stalks bluntly cut, and a shrubby stalk.

18. *SCABIOSA corollulis quinquefidis, foliis inferioribus crenatis, caulinis duplicato-pinnatis, caule fruticoso hirsuto.* Scabious with five-pointed florets, the under leaves crenated, those on the stalks doubly-winged, and a shrubby hairy stalk.

19. *SCABIOSA corollulis multifidis, calycibus florum longioribus, caule ramoso, foliis dissectis.* Scabious with many-pointed florets, longer empalements to the flowers, a branching stalk, and cut leaves.

The first sort grows naturally in the fields in divers parts of *England*; it hath a strong, thick, fibrous root, sending out many branching stalks, which rise three feet high; the lower leaves are sometimes almost entire, and at others they are cut into many segments almost to the midrib. The stalks are covered with stiff prickly hairs, garnished with smaller leaves at each joint, which are cut into narrow segments almost to the midrib. The flowers are produced upon naked foot-stalks at the end of the branches; they have a double empalement, which is hairy, and composed of several tubulous florets, cut into four points at the top, each having a particular empalement, resting upon the common placenta. The florets round the border are larger and deeper cut than those which compose the disk or mid-

dle; they have four weak stamina, which soon shrink after the flowers open. In the center is situated a style, which is longer than the floret, terminated by a roundish stigma. The flowers are of a pale purple colour, and have a strong faint odour. This is the sort intended by the College of Physicians for medicinal use, under the title of Scabiosa.

The second sort grows naturally in moist woods and pastures in most parts of *England*, and is directed by the College of Physicians to be used, under the title of *Morsus Diaboli*, or Devil's Bit; this hath a short tap-root, which appears as if the end of it were bitten or cut off, from whence it had the titles of *Succisa*, and *Morsus Diaboli*. The leaves are oval, spear-shaped, and smooth; the stalks are single, about two feet high, garnished with two leaves at each joint, shaped like those below, but smaller; they generally send out two short foot-stalks from their upper joint, standing opposite, which are each terminated by one small blue flower, as is also the principal stalk with one larger. These are constructed in the same way as the former. As these plants are to be found plentifully in the fields and woods, they are seldom admitted into gardens.

The third sort grows naturally in *Transylvania*. It is an annual plant, which is preserved by botanists for variety; but as the flowers have little beauty, so it is rarely allowed a place in other gardens. The stalks rise four or five feet high, dividing into several branches; the leaves are hairy, cut almost to the midrib. The flowers are small, of a pale-purplish colour; the seeds ripen in autumn; if they are permitted to scatter, the plants will come up without care.

The fourth sort grows naturally in *Spain* and *Portugal*. It is an annual plant; the stalk is stiff, and rises upward of three feet high, dividing toward the top into several branches, which are again divided into naked foot-stalks, each sustaining one small, pale, purplish flower, composed of many florets; the leaves are stiff, and cut into many winged points.

The fifth sort grows naturally upon the *Alps* and *Apennines*. This hath a perennial root, from which come out many entire, smooth, spear-shaped leaves; the stalk is single, sending out two short naked foot-stalks from the upper joint; the leaves upon the stalks are cut pretty deeply on their edges. The flowers are nearly of the same size and form with those of the first sort. It may be propagated by seeds, and will thrive in a shady moist border, requiring no other care but to keep the ground clean, and allow them room to spread.

The sixth sort is a biennial plant, which grows naturally in some parts of *Italy*, and also in *Tartary*. It rises with a strong branching stalk four or five feet high, closely armed with stiff prickly hairs; the lower leaves are spear-shaped, cut deeply on the sides in winged points; those upon the stalks are more entire, some of them are sharply sawed on their edges, and those at the top are linear and entire. The flowers grow from the sides and at the top of the stalks; they are white, and each floret sits in a bristly empalement. The seeds ripen in autumn; it rises from scattered seeds, and requires no care.

The seventh sort grows naturally in *Isiria*. This hath a perennial root; the lower leaves are almost entire; the stalk is stiff, and rises two feet high, dividing into two upward, which spread asunder; and in the division arises a naked foot-stalk, which (as also the side branches) are terminated by flowers, composed of many white florets, inclosed in a scaly empalement, whose scales are obtuse; the leaves on the stalks are wing-pointed and stiff.

The eighth sort grows naturally upon the mountains in *Italy*. This has a perennial root, from which arise three or four stalks, whose lower parts are garnished with linear leaves, of a silvery colour, ending in acute points; the upper

per part of the stalk is naked, sustaining at the top one pale blue flower, made up of several four-pointed florets. It is propagated by seeds as the other sorts, and loves a soft loamy soil and a shady situation.

The ninth sort grows naturally on the *Alps*. This has a perennial root, from which arise several pretty strong hairy stalks three feet high, garnished with spear-shaped leaves, placed opposite, which embrace the stalks half round with their base; they are of a dark green on their upper side, but pale on their under, hairy, having a few indentures on their edges, and ending in acute points. The flowers are produced at the top of the stalks in the same manner as those of the first sort, and are like them. This is hardy, and loves a light loamy soil and a shady situation; it is propagated by seeds.

The tenth sort grows naturally on the *Alps*. This has a perennial root, composed of many strong fibres, from which arise several strong channelled stalks upward of four feet high, garnished with winged leaves, composed of four or five pair of lobes, which are unequal in size and irregularly placed, sawed on their edges, and end in acute points. The flowers are produced on naked foot-stalks at the end of the branches; the receptacles are globular; the flowers are of a whitish yellow, and the seeds ripen in autumn. This may be propagated either by seeds or parting of the roots; it loves a loamy soil.

The eleventh sort grows naturally in *Sicily*. This rises with a shrubby stalk three feet high, dividing into several ligneous knotty branches, garnished with narrow silvery leaves, which are entire. The flowers stand upon very long naked foot-stalks at the end of the branches; they are made up of many five-pointed tubulous florets, of a fine blue colour. These are not succeeded by seeds here. It is propagated by slips or cuttings, which readily take root if they are planted in any of the summer months, if they are shaded from the sun, and duly refreshed with water. When these have made good root, some of them may be planted on a dry border near to a south wall, where they will live in common winters; but as they are frequently destroyed by severe frost, so some of the plants should be planted in pots, and in winter placed under a common frame, where they may be protected from frost, but in mild weather enjoy the free air.

The twelfth sort grows naturally in *Crete*. This hath a shrubby stalk, which rises about the same height as the former, and divides into many branches; the leaves are shorter, much broader, and not so white as those of the former sort; the flowers are not so large, and are of a pale purple colour. This flowers from the end of *June* till autumn, but it does not ripen seeds in *England*. It is propagated by slips or cuttings in the same way as the former, and requires the same treatment.

The thirteenth sort grows naturally in *Germany*. This hath a perennial root, sending out many leaves near the ground, which are divided into narrow segments to the midrib; these segments are cut on their edges into regular acute points, like winged leaves; the stalks rise two feet high, garnished with very narrow cut leaves; they divide into several long foot-stalks, each being terminated by a yellowish flower, with radiated borders. This may be propagated by seeds, and will thrive any where.

The fourteenth sort grows naturally in the *Levant*. This is a low perennial plant, with a branching stalk; the lower leaves are cut, but the upper leaves are narrow and entire, of a silvery colour. The flowers are small, of a pale colour, and have no scent, so is only kept in botanick gardens for the sake of variety. It is propagated by seeds, and is hardy enough to live in the open air.

The fifteenth sort grows naturally in *India*. This is an

annual plant, which is commonly cultivated in gardens for ornament. Of this there is a great variety in the colour of their flowers; some of them are of a purple, approaching to black, others are of a pale purple, some are red, and others have variegated flowers; these also vary in the shape of their leaves, some of them having finer cut leaves than others; and sometimes from the side of the flower-cup; there comes out many slender foot-stalks, sustaining small flowers, in like manner as the *Hen and Chicken Daisies*; but as these are accidental varieties which come from the same seeds, they need not be particularly enumerated here.

The flowers of this sort are very sweet, and continue a long time. The plants are propagated by sowing of their seeds; the best time for which is about the latter end of *May* or the beginning of *June*, that the plants may get strength before winter; for if they are sown too early in the spring, they will flower the autumn following, and the winter coming on soon, will prevent their ripening seeds; besides, there will be fewer flowers upon those, than if they had remained strong plants through the winter, and had set forth their flower-stems in spring; for these will branch out, and produce a prodigious number of flowers, continuing a succession of them on the same plants from *June* to *September*, and produce good seeds in plenty.

The seeds of these plants should be sown upon a shady border of fresh earth (for if they are sown upon a place too much exposed to the sun, and the season should prove dry, few of them will grow.) When the plants come up, they may be transplanted into other beds or borders, observing to water and shade them until they have taken root; after which they will require no farther care, but to keep them clear from weeds till *Michaelmas*, when they may be transplanted into the middle of the borders in the pleasure-garden, where the several sorts being intermixed, will make an agreeable variety.

The sixteenth sort grows naturally in *Spain*. This is an annual plant; the stalks rise three feet high; they are hairy, and garnished with oblong leaves, which are deeply notched on their edges; those on the upper part of the stalk are cut almost to the midrib into fine segments. The flowers stand upon long foot-stalks at the top of the stalks; these have globular receptacles; the florets are large, and spread open like a star; they are of a pale purple colour; in favourable seasons the seeds ripen in *September*, but in cold moist years they do not ripen here. It is propagated by seeds, which should be sown in beds of light loamy earth, where the plants are to remain; when the plants come up, they must be thinned and kept clear from weeds, which is all the culture they require.

The seventeenth sort grows naturally at the *Cape of Good Hope*. This hath a weak shrubby stalk, which divides into several branches, rising about five feet high, garnished with oval spear-shaped leaves, which are entire, and deeply crenated on their edges, of a light green, and a little hairy. The flower-stalk is produced at the end of the branches, sustaining one pale flesh-coloured flower, composed of many five-pointed florets. This plant continues flowering great part of summer, and sometimes it produces good seeds in *England*.

The eighteenth sort is also a native of the *Cape of Good Hope*. It hath a shrubby stalk like the former; the stalks are hairy, and divide into several branches, garnished toward the bottom with spear-shaped, entire, crenated leaves, but those on the upper part of the stalk are doubly winged. The flowers are produced upon long naked stalks at the end of the branches; they are large, of a pale flesh colour, but have no scent; they continue in succession all the summer, and sometimes the early flowers are succeeded by seeds, which ripen in autumn.

Both these sorts may be propagated by cuttings, which may be planted in a shady border during any of the summer months. When these have put out good roots, they should be taken up and planted in pots, and placed in the shade till they have taken new root; then they may be removed to a sheltered situation, where they may remain till the frost begins, when they should be removed to shelter, for they are too tender to live in the open air through the winter; but as they only require protection from frost, so they should have as much free air as possible in mild weather, to prevent their being drawn up weak; and in the middle or latter end of *April*, they may be placed in the open air in a warm situation, afterward treating them as other hardy foreign plants.

The nineteenth sort grows naturally about *Aleppo*. This is an annual plant, with a very branching stalk near three feet high, garnished with leaves at each joint that are variously cut. The flowers are produced upon long foot-stalks at the end of the branches; they have very long empalements; the florets round the border are cut into several fringed segments. They are of a flesh colour, and continue in succession from *July* to autumn, and in favourable seasons the seeds ripen here pretty well. This is propagated by seeds, which should be sown, and the plants afterward treated in the same way as the common Sweet, or *Indian Scabious*.

SCANDIX. *Tourn. Inst. R. H.* 326. *tab.* 173. *Shepherds Needle, or Venus-comb.*

The Characters are,

It hath an umbelliferous flower; the general umbel is long and has few rays; the particular umbels have many: the general umbel has no involucre, the particular have a five-leaved one the length of the umbels: the general umbel is deformed, and has hermaphrodite florets in the disk, and female in the rays. The flowers have five inflexed heart-shaped petals; the inner are small, and the outer large; and five slender stamina, terminated by roundish summits, with an oblong germen, supporting two permanent styles, crowned by obtuse stigmas. The germen afterward turns to a long fruit, divided in two parts, each having one furrowed seed, convex on one side, and plain on the other.

The Species are,

1. SCANDIX *feminibus laevibus rostro longissimo.* *Hort. Cliff.* 101. Scandix with smooth seeds, and the longest beak; common *Shepherds Needle*.

2. SCANDIX *feminibus subulatis hispida, floribus radiatis, caulibus laevibus.* *Lin. Sp. Plant.* 257. Scandix with prickly awl-shaped seeds, radiated flowers, and smooth stalks.

3. SCANDIX *feminibus pedunculo villosa brevioribus.* *Flor. Leyd.* 111. Scandix with short hairy foot-stalks.

4. SCANDIX *feminibus hispida, involucri umbello multifida, caulibus asperis.* Scandix with bristly seeds, many-pointed involucre to the umbels, and rough stalks.

5. SCANDIX *feminibus sulcatis angulatis.* *Hort. Cliff.* 101. Scandix with angular furrowed seeds.

6. SCANDIX *feminibus ovatis hispida, corollis uniformibus, caule laevi.* *Lin. Sp. Plant.* 257. Scandix with oval rough seeds, the petals of the flowers uniform, and a smooth stalk.

The first sort grows naturally in stiff lands amongst the Corn in many parts of *England*, so is not cultivated in gardens. It is an annual plant; the leaves are finely divided into small segments, and have long foot-stalks; the stalks rise six inches high. The flowers are small, white, and like those of wild *Chervil*, and sit upon the top of the beak or horns, which are the rudiment of the pod. At the bottom of the small umbel five leaves embrace the stalk, with broad and short foot-stalks, which are afterward cut into small segments like the rest: the seed is long, and runs into a small point, resembling a large needle, but the umbels have great resemblance to the umbels of *Musk Crane's-bill*.

If the seeds are permitted to scatter, there will be a plentiful supply of young plants.

The second sort grows naturally in the south of *France, Italy, and Crete*. This is an annual plant, with low spreading stalks, garnished with very narrow fine cut leaves, placed thinly. The flowers are small, white, and stand in small umbels at the top of the stalks; these are succeeded by awl-shaped rough seeds.

The third sort grows naturally in the *Levant*. This is an annual plant, with fine cut leaves; the stalks rise eight inches high, garnished at each joint with a fine cut leaf, and terminated by an umbel of white flowers, with large heart-shaped petals. The horns of this are longer than of any other sort, and their foot-stalks are very short and hairy.

The fourth sort grows naturally in *Crete*. This hath larger leaves than either of the former, which are finely cut; the stalks grow a foot high, and divide into many rough channelled branches; the umbels have a many-leaved involucre, and the seeds are rough.

These four sorts will sow themselves where-ever they are once introduced, and require no other care but to thin them, and keep them clean from weeds.

The fifth sort grows naturally in *Germany*, but has been long kept in the *English* gardens, and of late years the seeds have been thrown out of gardens, so that the plants are frequently found growing naturally in the neighbourhood of those gardens. It has a very thick perennial root, composed of many fibres, of a sweet aromack taste like *Aniseed*, from which come forth many large leaves, that branch out somewhat like those of *Fern*, from whence it was titled *Sweet Fern*. The stalks grow four or five feet high; they are hairy and fistulous. The flowers are disposed in an umbel at the top of the stalk; they are white, and have a sweet aromack scent: the out-petal of the flower is large; the two side ones are of a middle size, but the two inner are small; these are succeeded by long, angular, furrowed seeds, having the taste and scent of *Aniseed*.

This sort propagates fast by seeds, which, if permitted to scatter, there will be plenty of the plants arise, and these may be transplanted to any abject part of the garden, for it will grow in any soil or situation, and will require no care.

The sixth sort grows naturally on the side of banks and foot-ways in many parts of *England*. This is an annual plant, whose seeds drop early in the summer; the plants come up in autumn, and flower early in the spring. The leaves of this are finely divided, very like those of the *Garden Chervil*, but are hairy; the stalks rise a foot and a half, or two feet high, dividing into branches. These sustain umbels of small white flowers, which are succeeded by short, hairy, crooked seeds.

There have been some instances of the ill effects of this plant, when taken inwardly; some who have eaten this herb in soups, by mistaking it for *Garden Chervil*, have narrowly escaped with their lives.

SCHINUS. *Lin. Gen. Plant.* 479. *Indian Mastick.*

The Characters are,

The flower hath a small empalement with five indentures at the top; it has five small petals, which spread open, and nine or ten slender stamina, with a roundish germen, supporting a short thick style, crowned by a single stigma. The germen afterward turns to a globular berry with one cell, inclosing one globular seed.

The Species are,

1. SCHINUS *foliis pinnatis, foliolis serratis, impari longissimo, petiolo aequali.* *Lin. Sp. Plant.* 388. Schinus with winged leaves, whose lobes are sawed, the end one being very long, and the foot-stalks equal.

2. SCHINUS *foliis pinnatis, petiolo marginato articulado subtus aculeato.* *Lin. Sp. Plant.* 389. Schinus with winged leaves,

leaves, and jointed bordered foot-stalks, having thorns on the under side.

These are all the species of this genus which I have seen growing in the *English* gardens, for the Iron Wood of *Jamaica*, which Dr. *Linnaeus* has ranged in this genus, has male and female flowers on different trees; and the male flowers which have blown here, are Polyandria, so cannot be here placed.

The first sort grows naturally in *Peru* and *Mexico*; from both these countries I have received the seeds. This rises with a woody stalk ten or twelve feet high, dividing into many branches, covered with a dark brown bark; the leaves are placed alternate on the branches; they are composed of several pair of lobes, from ten to fifteen, terminated by one lobe, which is longer than the others, of a lucid green, and when bruised emit a turpentine odour. The flowers are produced in loose bunches at the end of the branches; they are very small, white, and composed of five small petals, which have small empalements, indented in five parts at the brim.

This plant is propagated by seeds, which should be sown in pots, and plunged into a moderate hot-bed. If the seeds are good, the plants will appear in about five or six weeks; and if they are properly managed, by admitting fresh air daily to them, according to the warmth of the season, they will be fit to transplant in about five or six weeks after, when they should be each planted in a small pot, and plunged again into a moderate hot-bed, shading them from the sun till they have taken fresh root; then they must be gradually inured to the open air, into which they should be removed soon after, placing them in a sheltered situation, where they may remain till autumn; but they must be removed into shelter before the first frosts, otherwise their tops will be killed, and thereby the plants are frequently destroyed.

These plants are tender when young, so require a little warmth in winter; but after two or three years growth, they will live in a green-house, where, as they retain their leaves all the year, they will make a variety. It may also be propagated by layers and cuttings; the layers should be put down in the spring, and by the following spring they will be rooted; the cuttings should be planted in *April*, which will put out roots in about two months, and may afterward be treated as the seedling plants.

The second sort grows naturally in the *West-Indies*. This rises with a ligneous stalk eight or ten feet high, sending out many branches, which have a grayish bark, garnished with winged leaves, whose midrib is bordered and jointed, armed with crooked spines under each joint. The lobes are small, oblong, of a lucid green; the spines are short and crooked. This sort has not as yet produced flowers in the *English* gardens, so I can give no farther description of the plant.

It is propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners bark; these seeds will often lie three or four months in the ground, and sometimes a whole year; therefore if the plants should not come up the same year, the earth should not be disturbed in the pots, but placed in the winter in the bark-bed in the stove, and the spring following plunged again into a fresh hot-bed, which will bring up the plants if the seeds are good. When the plants are come up, and are fit to remove, they should be each planted in a separate small pot, and plunged into the tan-bed, where they must be shaded till they have taken new root, after which they must be treated as other tender stove-plants.

SCILLA. *Lin. Gen. Plant.* 378. Squills.

The Characters are,

The flower has no empalement; it has six oval petals, which

spread open like a star, and six awl-shaped stamina, terminated by oblong prostrate summits. It has a roundish germen, supporting a single style, crowned by a single stigma. The germen afterward becomes a smooth oval capsule with three furrows, divided into three cells, filled with roundish seeds.

The Species are,

1. SCILLA radice tunicatâ. *Hort. Cliff.* 123. Squill with a coated root; common Squill.

2. SCILLA radice squamatâ. *Hort. Cliff.* 123. Squill with a scaly root.

3. SCILLA radice solidâ, corymbo conferto hemispherico. *Lin. Sp. Plant.* 308. Squill with a solid root, and an hemispherical corymbus of flowers.

4. SCILLA radice solidâ, corymbo conferto conico. *Lin. Sp. Plant.* 309. Squill with a solid root, and a conical corymbus of flowers.

5. SCILLA radice solidâ, floribus lateralibus alternis subnutantibus. *Hort. Cliff.* 123. Squill with a solid root, and flowers growing alternately from the sides of the stalk, which nod.

6. SCILLA radice solidâ, floribus lateralibus crebriusculis paucioribus. *Hort. Cliff.* 123. Squill with a solid root, and erect flowers growing thinly.

7. SCILLA radice solidâ, foliis filiformibus linearibus floribus corymbosis, pedunculis nudis adscendentibus longitudine floris. *Lin. Sp. Plant.* 309. Squill with a solid root, slender linear leaves, flowers growing in a corymbus, and naked foot-stalks.

8. SCILLA radice solidâ, floribus paniculatis subnutantibus. Squill with a solid root, and flowers growing in panicles, which nod.

9. SCILLA radice solidâ, racemo conico, floribus numerosis adscendentibus. Squill with a solid root, and a conical spike of many flowers, rising above each other.

10. SCILLA radice solidâ, corymbo conferto hemispherico, scapo longissimo. Squill with a solid root, an hemispherical corymbus, and the longest stalk.

The first is the Squill or Sea Onion, whose roots are used in medicine, of which there are two sorts, one with a red, and the other a white root, which are supposed to be accidental varieties, but the white are generally preferred for medicinal use. The roots are large, somewhat spear-shaped, composed of many coats, lying over each other like Onions; at the bottom come out several fibres. From the middle of the root arise several shining leaves, which continue green all the winter, and decay in the spring; then the flower-stalk comes out, which rises two feet high, is naked half way, and terminated by a pyramidal thyrse of flowers, which are white, composed of six petals, which spread open like the points of a star. This grows naturally on the sea-shores, and in the ditches, where the salt water flows with the tide, in most of the warm parts of *Europe*, so cannot be propagated in gardens, the frost in winter always destroying the roots, and for want of salt water they do not thrive in summer. Sometimes the roots, which are brought for use, put out their stems, and produce flowers without being planted in earth, as they lie in the druggists shops.

The second sort grows naturally in *Spain*, *Portugal*, and the *Pyrencees*. This has a scaly root like the Lily, for which reason *Tournefort* separated it from the starry Hyacinth, and constituted a genus of it with the title of Lilio Hyacinthus. The root is oblong and yellow, very like those of *Martagon*; the leaves are shaped like those of the white Lily, but smaller; the stalk is slender, and rises a foot high; it is terminated by blue flowers like those of the starry Hyacinth.

The third sort grows naturally in *Portugal*. This hath a roundish, solid, bulbous root, like the Hyacinth. The leaves come out sparsedly, are very like those of the *English*

Hair-bells; the stalk rises seven or eight inches high, and is terminated by clustered flowers of a pale blue colour, which at first are disposed in a sort of umbel or depressed spike, but afterward draws up to a point, forming a conical corymbus.

The fourth sort grows naturally in *Spain* and *Portugal*. This has been long known in the *English* gardens by the title of Hyacinth of *Peru*. There are two varieties of this, one with a deep blue, and the other a white flower; the latter is more rare here than the former. The root of this is large, solid, and raised in the middle a little pyramidal, covered with a brown coat, from which come out five or seven leaves before winter, of a lucid green, keeled, and spread almost flat on the ground. From the center of these come out one, two, or three stalks, according to the strength of the root; these are thick, succulent, six or eight inches high, terminated by a conical corymbus of flowers, of a deep blue in some, and others are white, standing upon pretty long foot-stalks; they are composed of six petals, which spread open like a star. In the center of the petals is situated a large roundish germen, supporting a short style, crowned by a single stigma, and round the germen come out six short stamina, which spread asunder, terminated by oblong prostrate summits. The germen afterward turns to a roundish three-cornered capsule, having three cells, which are filled with roundish seeds.

The fifth sort grows naturally in *Byzantium*, and was introduced here about the year 1590. The root of this is large, solid, and of a purplish colour, from which come out five or six leaves a foot long, are keeled, channelled, and of a lucid green; between these arise two, three, or four purplish stalks about eight or nine inches high, sustaining toward the top five or six Star-flowers, which come out singly from the side of the stalk; they are of a Violet blue colour, having a prominent germen in the center, supporting a slender style, attended by six slender stamina, terminated by purple summits.

The sixth sort is commonly known in the gardens by the title of early starry Hyacinth. There are two varieties of this, one with a deep blue, and the other with a white flower; they grow naturally in some parts of *France* and *Germany*. The roots are solid, roundish, about the size of a Nutmeg, from which comes out a slender channelled stalk four or five inches high, having generally two leaves near the bottom, one situated above the other, which embrace the stalk with their base. The flowers are thinly placed toward the top of the stalk; the lower ones have foot-stalks an inch long, but those of the upper shorten gradually to the top; they are composed of six petals, spreading in form of a star, having a turgid germen in the center, supporting a short style, attended by six stamina, which in the blue flowers are of the same colour, and those in the white flowers are white.

The seventh sort is the small autumnal starry Hyacinth, which grows naturally in several parts of *England*, particularly on *St. Vincent's Rock* near *Bristol*, at the *Lizard-Point* in *Cornwall*, upon *Blackbeath* in *Kent*, and *Richmond-green*. This has a round, white, bulbous root, from which come forth a few narrow leaves about six inches long. In the center of these arise one or two slender stalks five or six inches high, naked, sustaining a small corymbus of flowers at the top, which are small, star-pointed, and of a pale blue colour; these appear the beginning of *September*, at which time the leaves come out, and continue growing all the winter, and in the spring they die away.

The eighth sort grows naturally in *Spain* and *Portugal*. It hath an oblong, white, bulbous root, from which come out five or six leaves a foot long, a little keeled. The flower-stalk rises nine or ten inches high, is firm, and

sustains many starry flowers at the top, disposed in a loose panicle, each standing upon a pretty long foot-stalk, which is erect, but the flower nods on one side; they are of a deep blue Violet colour, having a prominent germen, which afterward turns to a three-cornered capsule, having three cells, filled with roundish seeds.

The ninth sort grows naturally in *Italy*. This hath a solid, white, bulbous root, from which arise several leaves like those of the common sort. The stalk rises ten or eleven inches high, terminated by a conical racemus of flowers, of a deep purple colour.

The tenth sort has a very large bulbous root, from which come out several leaves, which at first are upright, but afterward bend toward the earth; they are of a thick substance and keeled, of a lucid green, with downy threads on their under side. Between the leaves arise the flower-stalk, which is a foot and a half long, round, firm, and naked, sustaining at the top a large cluster of flowers, formed into an hemispherical corymbus: these have six petals, which spread open in form of a star, of a purple colour, and have blue bottoms, with a dark blue vein running lengthwise in the middle of each petal.

There is another sort of this, which grows naturally in the *Lewant*, whose leaves are shaped like those of the *Peruvian* Hyacinth, but longer, and stand erect; this propagates very fast by offsets, but never flowers here. I have kept the roots in all situations almost forty years, and have not seen one flower.

These plants are all of them hardy, and may be propagated by seeds or offsets, the latter being the more expeditious way, is generally practised. The roots may be transplanted after the leaves are decayed, but, if they are removed after they have put out new fibres, they rarely succeed, at least they will not flower the following spring; they may be treated in every respect like the ordinary kinds of Hyacinths.

If they are propagated by seeds, they should be sown in autumn, soon after they are ripe, either in shallow boxes or pans, in the same manner as has been before directed for Hyacinths, to which the reader is desired to turn, to avoid repetition.

SCLAREA. *Tourn. Inst. R. H. 179. tab. 82. Clary.*

The Characters are,

The flower has a tubulous empalement, which widens at the top, and has five acute points at the brim; it is of the lip kind, with one petal, having a crooked tube, which enlarges at the chaps, where it is divided into two lips; the upper lip is erect and arched; the under lip is cut into three segments; it has two stamina, which are situated under the upper lip, terminated by oblong erect summits, and a four-pointed germen, supporting a forked style longer than the upper lip, crowned by a bifid stigma. The germen afterward becomes four roundish seeds, which ripen in the empalement.

The Species are,

1. SCLAREA foliis rugosis oblongo-cordatis serratis, floribus calyce longioribus concavis acuminatis. Clary with rough, oblong, heart-shaped, sawed leaves, those among the flowers concave, pointed, and longer than the empalement; or common Clary.

2. SCLAREA foliis oblongis dentato-angulatis tomentosiss, verticillis lanatis. Clary with oblong, angular, indented, woolly leaves, and the whorls of the flowers covered with down.

3. SCLAREA foliis oblongo-ovatis dentato-serratis tomentosiss, verticillis lanatis sessilibus. Clary with oblong oval leaves, which are woolly, indented like a saw, and woolly whorls of flowers sitting close to the stalk.

4. SCLAREA foliis ovatis sinuato-dentatis tomentosiss, caule erecto, verticillis lanatis sessilibus. Clary with oval, sinuated, indented

indented leaves, which are woolly, an erect stalk, and woolly whorls fitting close to the stalks.

5. *SCLAREA foliis cordato-oblongis crenatis summis amplexicaulibus, verticillis subnudis, corollarum galeis glutinosis.* Clary with oblong, heart-shaped, crenated leaves, those on the top embracing the stalk, almost naked whorls, and the helmet of the flower glutinous.

6. *SCLAREA foliis lanceolatis obsolete crenatis subtus tomentosis, verticillis minoribus subnudis.* Clary with spear-shaped leaves, which are slightly crenated, woolly on their under side, and very small whorls of flowers, which are almost naked.

7. *SCLAREA foliis cordato-oblongis crenatis glabris, floribus verticillato-spicatis.* Clary with oblong, heart-shaped, crenated, smooth leaves, and spiked whorled flowers.

8. *SCLAREA foliis cordato-lanceolatis acutis, bracteis coloratis, flore brevioribus.* Clary with heart-shaped acute-pointed leaves, and coloured bractæ, which are shorter than the flower.

9. *SCLAREA foliis rugosis pinnatifidis lanatis.* Clary with rough, wing-pointed, woolly leaves.

10. *SCLAREA foliis cordatis acutè crenatis, summis sessilibus, verticillis subnudis remotissimis.* Clary with heart-shaped leaves, which are sharply crenated, those on the top fitting close to the stalks, and naked whorls placed far asunder.

11. *SCLAREA foliis lanceolatis acuminatis, serratis, summis sessilibus, floribus verticillato-spicatis.* Clary with spear-shaped, acute-pointed, sawed leaves, the upper ones fitting close to the stalks, and spiked whorled flowers.

12. *SCLAREA foliis cordato-sagittatis serratis acutis.* Clary with heart-shaped crenated leaves, which are acutely sawed.

13. *SCLAREA foliis ovato-lanceolatis integerrimis, summis cordatis amplexicaulibus hirsutis.* Clary with oval, spear-shaped, entire leaves, those above heart-shaped, embracing the stalks, and hairy.

14. *SCLAREA foliis cordato-ovatis rugosis tomentosis, calycibus hispидis, radice tuberosâ.* Clary with oval, heart-shaped, rough, woolly leaves, prickly empalements, and a tuberous root.

15. *SCLAREA foliis hastato-triangularibus obsolete crenatis, caule tomentoso paniculato.* Clary with triangular halberd-pointed leaves, which are slightly crenated, and a woolly paniculated stalk.

16. *SCLAREA foliis ovatis, utrinque acuminatis serratis.* Clary with oval leaves, pointed at each end, and sawed.

The first sort grows naturally in *Syria*, but has been long cultivated in the *European* gardens, both for the kitchen and shops: it is a biennial plant, which perishes after it has borne seeds. The lower leaves of this are large, rough, wrinkled, oblong, and heart-shaped, and are sawed on their edges. The stalks are large, four-cornered, and clammy, about two feet high, garnished with leaves of the same shape as those at bottom, but smaller, sending out small side branches opposite; the flowers are disposed in large loose spikes at the top of the stalks, placed in whorls round them, of a pale blue colour, having two short hollow acute-pointed leaves under each, of a whitish colour. The empalement of the flower is divided into two lips, the upper ending in three, and the under in two spiculæ. The upper lip of the flower stands erect, is arched at the top, under which is the style, which is nearly of the same length, and the two stamina, which are shorter, sit close to the style. After the flowers are past, the germen turns to four roundish seeds, which ripen in the empalement. The whole plant has a very strong scent.

It is propagated by seeds, which should be sown in the spring, and when the plants are fit to remove, they should be either transplanted into beds, or if a large quantity is required, they may be planted in an open spot of ground in

rows two feet asunder, and one foot distance in the rows. After the plants have taken root, they will require no farther care, but to keep them clean from weeds. The winter and spring following the leaves, which are the only part used, will be in perfection, and in the summer they will run up to flower, and, after they have ripened their seeds, decay, so that there should be annually young plants raised for use.

The second sort grows naturally in *Istria* and *Dalmatia*. There are two varieties of this, one with very broad leaves, which are slightly indented on the sides; the other has longer leaves, which are deeply jagged. The leaves of both sorts are of a thick substance, very woolly, especially on their under side; their upper sides are rugged, and wrinkled like the first sort. The stalks are square, two feet high, sending out many branches opposite, garnished in the first with entire, oval, acute-pointed leaves, which embrace the stalks with their base, but those of the other are long, narrow, and have several deep indentures on their edges. The stalk and branches are terminated by spikes of flowers in whorls; under each of these whorls are two hollow green leaves, which are shorter than the empalement of the flowers; these empalements are divided into two lips, the upper ending in three, and the under in two spiculæ. The under lip or beard of the flower is white, and the helmet or galea is of a pale blue colour; the plants may be propagated in the same way as the first.

The third sort has some resemblance of the second; but the leaves are larger, very woolly, and glutinous, oblong, oval, deeply indented, and end with very acute points. The stalks are woolly, four-cornered, about two feet and a half high, sending out branches by pairs, terminated in loose spikes of whorled flowers, which are smaller than those of the other sorts. It grows naturally in *Portugal* and also in *Syria*; it is propagated by seeds in the same way as the first.

The fourth sort grows naturally in *Sicily* and in the *Archipelago*. The roots of this will continue three or four years; the leaves are oval, very thick, and woolly, and have a few indentures on their borders; the stalks are generally single and erect. When they send out any branches, it is only at bottom, and scarce ever more than two, which also grow erect. The flowers grow in pretty thick whorls almost the length of the stalks; they are shaped like those of the former. This may be propagated by seeds in the same manner as the former, but loves a dry soil.

The fifth sort grows naturally in some parts of *France* and *Germany*; it is generally found in meadows and rich pastures. It has a perennial root, composed of many strong ligneous fibres, from which come out many oblong heart-shaped leaves, of a deep green colour, whose surfaces are rough, crenated on their edges, and stand upon pretty long foot-stalks. The stalks rise three feet high; they are four-cornered; their lower parts are garnished with leaves, whose base embrace them; the flowers grow in long whorled spikes at the top; they are of a fine blue colour, having scarce any small leaves under the whorls. It is propagated by seeds, but the roots continue long.

The sixth sort grows naturally in *Syria*; this is an abiding plant, whose roots run deep in the ground. The leaves are spear-shaped, crenated on their edges, and a little woolly on their under side. The stalks are slender, stiff, and rise a foot and a half high, garnished with smaller leaves of the same shape, set by pairs; the flowers grow in small whorls, disposed in loose spikes at the top of the stalks; they are small, blue, and shaped like those of the other sorts. It is propagated by seeds in the same way as the other sorts.

The seventh sort grows naturally on the sides of highways about *Vienna* and in *Hungary*. This has an abiding root, sending

sending out smooth leaves about the size and shape of those of broad leaved Sage, but are indented on their edges. The stalks are slender, four-cornered, and rise a foot and a half high; their lower parts are garnished with leaves like those at the bottom, but smaller, and are terminated by small whorls of blue flowers. It is propagated by seeds in the same way as the first sort, but the roots will continue several years.

The eighth sort grows naturally in *Austria* and *Bohemia*. This has an abiding root, from which come out many heart spear-shaped leaves, crenated on their edges, of a bright green colour, and have many white spots, dispersed on their surface. The stalks are thick, four-cornered, and rise near three feet high, garnished with leaves by pairs, sitting close to the stalks, which are terminated by loose spikes of flowers in small whorls, whose bractæ are coloured. It is propagated by seeds as the former sorts.

The ninth sort grows naturally in *Syria*; this is a biennial plant. The leaves are very thick, woolly, narrow, and wing-pointed, cut into obtuse segments, nearly opposite on their sides, almost to the midrib, somewhat like a stag's-horn in shape; these spread flat on the ground. The stalk rises more than a foot high; it is thick, four-cornered, and very woolly, sending out branches by pairs, garnished with narrow long leaves, placed opposite at each joint, sawed on their edges. The flowers grow in loose whorled spikes at the top of the stalks; they are shaped like those of the fourth sort. It may be propagated by seeds in the same way as the first sort, but should have a dry soil, otherwise the plants are apt to rot in winter.

The tenth sort grows naturally in *India*, but is hardy enough to live in the open air in *England*. The root of this will abide several years in a dry soil; the lower leaves are heart shaped, acutely crenated on their edges. The stalk is four-cornered, and rises four or five feet high, having two or three pair of smaller leaves on the lower part, standing opposite. The upper part of the stalk, for the length of two feet, is garnished with whorls of flowers, which stand at two or three inches distance from each other, having no leaves under them. The empalement of the flower is hairy and blunt; the galea or helmet of the flower is arched, erect, blue, terminating in a blunt point; the two side segments of the under lip are of a Violet colour; the middle segment, which is indented at the point, is white, and curiously spotted with Violet on the inside; the two side indentures turn yellow, before the flower drops. When the flower is past, the germen turns to four large roundish seeds, which ripen in the empalement. It is propagated by seeds in the same manner as the other sorts.

The eleventh sort grows naturally in the *Levant*. This hath a perennial root, from which come out many spear-shaped leaves, of a dark green colour, sawed on their edges, ending in acute points. The stalks rise three feet high, sending out branches by pairs, garnished with leaves, which toward the top sit close to the stalk. The flowers grow in whorled spikes at the top; they are of a bright blue colour, and the top of the spike is terminated with very deep blue flowers. It is propagated by seeds in the same manner as the other sorts, and the roots will abide many years.

The twelfth sort grows naturally in moist land both in *Germany* and *Italy*; this hath an abiding root, composed of strong ligneous fibres. The leaves are heart-shaped, pointed like a halberd, of a pale or yellowish green colour, and sawed on their edges. The stalks are strong, four-cornered, and rise near four feet high, garnished below with smaller leaves, but the upper part of the stalk is closely set with whorls of large yellow flowers. The whole plant is very clammy, and has a strong scent somewhat like the

first species. This is propagated by seeds in the same way as the other sorts; it is very hardy, and will continue several years, and may be increased by parting of the roots in autumn.

The thirteenth sort grows naturally in *Spain*. This has a perennial root. The lower leaves are oval and spear-shaped; the stalks rise two feet high; they are four-cornered, and send out branches by pairs; the leaves on the upper part of the stalks are heart-shaped, and embrace the stalks with their base; the flowers are of a brimstone colour, shaped like those of the first sort; the style of this is much longer than the upper lip, and is terminated by a bifid stigma; the empalements are hairy, and end with acute points. It is propagated by seeds, which may be sown in the same way as the other sorts, and the plants may be treated in like manner.

The fourteenth sort grows naturally in *Italy*. This has large swelling roots like dugs, as those of the Piony, from which arise many oval heart-shaped leaves spreading on the ground; they have pretty long foot-stalks, and are hairy; between these arise strong four-cornered stalks four feet high, garnished with leaves placed opposite. The upper part of the stalk is garnished with loose spikes of whorled flowers, of a purple colour. This is propagated by seeds in the same way as the other sorts, and the roots will continue several years.

The fifteenth sort grows naturally in the *Canary Islands*. This hath a perennial shrubby stalk, which rises five or six feet high, dividing into many branches, covered with a flocky down, and garnished with halberd-shaped triangular leaves, placed opposite, standing upon long woolly foot-stalks. The top of the stalk branches out in many foot-stalks, forming a sort of panicle. The flowers are of a light blue colour, ranged in whorled spikes, having two small leaves under each whorl. It is propagated by cuttings, which may be planted any time in summer; after they have put out good roots, they should be each planted in a separate small pot, placing them in the shade till they have taken new root; then they may be placed among other hardy kinds of green-house plants in a sheltered situation till *October*, when they should be removed into shelter before hard frost comes on; but as they only require protection from hard frost, so they should have as much free-air as possible in mild weather.

The sixteenth sort grows naturally in *Mexico*. This rises with a shrubby stalk eight or ten feet high, sending out slender, four-cornered, hairy branches, of a purplish colour, garnished with oval leaves, pointed at both ends, and sawed on their edges, of a pale green colour, and hairy on their under side. The flowers grow in close thick spikes at the end of the branches, of a fine blue colour, and appear in winter, so make a pretty variety in the green-house at that season. This plant never produces seeds in *England*, so it is only propagated by cuttings, which may be planted during any of the summer months, in the same manner as the former sort; and the plants may be treated afterward in the same way, with this difference, which is to give it a dry situation in winter, for the young shoots are very apt to grow mouldy upon being in a damp air.

There are some other sorts of less note, which are preserved in botanick gardens for the sake of variety; but those here mentioned are worthy of a place in large gardens, where, if they are intermixed among other large growing plants, they will afford a pretty variety; especially the fifth, eighth, tenth, and eleventh sorts, which produce long spikes of beautiful flowers, and continue a long time in flower. The flowers of the twelfth sort are used in *Holland*, to give a flavour to the *Rhenish* wines, which are brewed at *Dort*.

SCOLYMUS. *Tourn. Inst.* 480. *tab.* 273. The Golden Thistle.

The Characters are,

It hath a flower composed of many hermaphrodite florets, included in an oval imbricated empalement, having many loose sharp-pointed scales. The florets are tongue-shaped, slightly indented in five parts. They have five short hair-like stamina, terminated by tubulous summits. The germen is situated under the floret, supporting a slender style, crowned with two reflexed stigmas. The germen afterward becomes a single seed, which is oblong, triangular, and ripens in the empalement, the seeds being separated by plain, roundish, indented chaff.

The Species are,

1. SCOLYMUS *foliis margine attenuatis*. *Lin. Sp. Plant.* 813. Golden Thistle with leaves, whose edges are thin; or annual Golden Thistle.

2. SCOLYMUS *foliis margine incrassatis*. *Lin. Sp. Plant.* 813. Golden Thistle with leaves, which are thicker on the borders.

The first sort grows naturally in the south of France and Italy. This is an annual plant, which rises with a branching stalk five or six feet high, having two leafy wings running along the sides from joint to joint, which are scoloped and indented; the borders are thinner than the other parts, and armed every way with very sharp spines; they are of a pale green, and sit close to the stalks. The flowers are produced at the top of the stalks, inclosed in leafy involucrements, which are longer than the flowers, and armed with very strong spines; within these are scaly empalements, which lie over each other like the scales of fish, armed with short spines. The flowers are composed of many golden florets.

The second sort grows naturally in Italy and Sicily. This hath a biennial root, from which spring up thick stalks about four feet high, branching out on the sides, garnished with stiff jagged leaves, whose borders are thicker than the other part, armed with spines like the former sort; the stalks have leafy borders as the other, which are strongly armed with spines. The flowers are produced at the top of the stalks, and are shaped like those of the former sort.

They are propagated by seeds, which should be sown in March on a bed of fresh undunged earth, in an open situation; when the plants are come up, they should be kept clear from weeds, and where they grow too close, some of them should be pulled out, so as to leave those which are designed to remain, about two feet asunder. This is all the culture which these plants require, for as they send forth tap roots, they do not bear transplanting well; therefore they must be sown where they are to remain. When the seasons prove dry, the plants will perfect their seeds in autumn, but in wet seasons they rarely ever produce good seeds in England, which renders it difficult to continue the species, without procuring fresh seeds from abroad.

These plants are preserved by those persons who are curious in botany for variety's sake, but are rarely admitted in other gardens.

SCOPARIA. Sweet-weed, or Wild Liquorice.

The Characters are,

The empalement of the flower is cut into four concave segments; the petal is also divided into four equal parts. It has four equal stamina, crowned by short summits, with a conical style, terminated by an acute stigma. The flower is succeeded by a conical capsule, containing many small seeds.

There is but one Species of this genus, viz.

SCOPARIA *dulcis*. *Lin. Sp. Plant.* 116. Wild Liquorice, or Sweet-weed.

This plant grows naturally in most of the islands in the West-Indies, where it often is very troublesome in the plantations, for there is a great quantity of seeds upon each

plant, which, if suffered to scatter, the plants appear soon after, and become troublesome weeds.

The stalks rise about two feet high; they have six angles, branching out on their upper part, and at each joint have three obtuse sawed leaves, standing upon short foot-stalks; the flowers come out from the wings of the stalk upon foot-stalks, two, three, or four arising from the same place; they are white, a little fringed on their edges, and are succeeded by conical capsules, opening with two valves, filled with small seeds.

There is a great affinity between this plant and the Capraria, so that they have been often confounded by botanists; and even those who have been more accurate, have joined them in the same genus; but their difference consists in the form of the flower and the length of their stamina. The four segments in the petals of this are equal, as are also the four stamina; whereas the petal of Capraria is ringent, and two of the stamina are shorter than the other.

This is an annual plant, preserved in curious gardens for the sake of variety, but has little beauty. The seeds must be sown upon a hot-bed, and the plants transplanted on another hot-bed to bring them forward; toward the end of May, when the weather is good, they may be transplanted with balls of earth to their roots to a warm border, where they will flower, and will ripen their seeds in autumn.

SCORDIUM. See Teucrium.

SCORPIURUS. *Lin. Gen. Plant.* 792. Caterpillars.

The Characters are,

The empalement of the flower is of one leaf, erect, blown up, lightly compressed, ending in five acute points. The flower is of the butterfly kind; it has a roundish standard, indented at the point, where it is reflexed and spreading. The wings are loose, almost oval, having obtuse appendages. The keel is half-moon-shaped; the belly is gibbous, pointed, and erect, cut in two parts below. It hath ten stamina, nine joined and one separate, terminated by small summits; and an oblong taper germen a little reflexed, supporting a rising inflexed style, terminated by a point for a stigma. The germen afterward becomes an oblong, taper, leathery, rough, channelled pod, twisted in many longitudinal cells, divided within, and on the outside contracted into knotty joints, each cell containing one seed.

The Species are,

1. SCORPIURUS *pedunculis unifloris, leguminibus testis undique squamis obtusis*. *Lin. Sp. Plant.* 744. Caterpillar with one flower upon a foot-stalk, and a pod covered with obtuse scales on every side.

2. SCORPIURUS *pedunculis bifloris, leguminibus extrorsum obtusè aculeatis*. *Lin. Sp. Plant.* 745. Caterpillar with two flowers on each foot-stalk, and the outside of the pods armed with blunt spines.

3. SCORPIURUS *pedunculis subtrifloris, leguminibus extrorsum spinis distinctis acutis*. *Lin. Sp. Plant.* 745. Caterpillar with foot-stalks, having three flowers, and the outside of the pods armed with sharp distinct spines.

4. SCORPIURUS *pedunculis subquadrifloris, leguminibus extrorsum spinis confertis acutis*. *Lin. Sp. Plant.* 745. Caterpillar with four flowers sometimes upon a foot-stalk, and the outside of the pods armed with sharp spines, which grow in clusters.

5. SCORPIURUS *foliis pinnatis*. Caterpillar with a winged leaf.

The first sort grows naturally in Italy and Spain. This is an annual plant, with trailing herbaceous stalks, and at each joint have one spatule-shaped leaf with a long foot-stalk. From the wings of the leaves come out the foot-stalks of the flowers, which sustain at the top one yellow butterfly flower, which is succeeded by a twisted thick pod, in size and appearance of a large caterpillar, from whence it had this title.

The second sort has stronger stalks than the first; the leaves are much broader; the foot-stalks support two smaller flowers; the pods are slender, longer, and more twisted than those of the first, and are armed with blunt spines on their outside.

The third sort hath slenderer stalks than either of the former; the leaves stand upon shorter foot-stalks, but are shaped like those of the first sort; the foot-stalks of the flowers are slender, and frequently support three flowers; the pods are slender, not so much twisted as the former, and are armed on their outside with sharp distinct spines.

The stalks and leaves of the fourth sort are very like those of the first, but the foot-stalks of the flowers are longer, and each of them have three or four small yellow flowers at the top; the pods are very slender, greatly contorted, and armed with sharp spines on their outside.

The fifth sort has very short stalks; the leaves are winged, composed of four pair of small lobes, terminated by an odd one. The flowers are very small, as are also their pods, which are less twisted than those of the three former.

All these plants are annual, and grow naturally in most of the warm countries in *Europe*, but the first sort has been long cultivated in the *English* gardens.

The plants are preserved in several curious gardens for their oddness more than for any great beauty: they are propagated by sowing their seeds upon a bed of light earth; and when the plants are come up, they must be kept clean from weeds, and should be thinned, so as to leave them about ten inches or a foot asunder, because their branches trail upon the ground; and if they have not room, they are apt to overbear each other.

These plants seldom thrive well, if they are transplanted; therefore the best method is, to put in three or four good seeds in each place where you would have the plants remain. When the plants come up, there should be only one of the most promising left in each place, which should be constantly kept clear from weeds; and when their pods are ripe, they should be gathered and preserved in a dry place till the following spring, to be sown.

The first sort is the best worth cultivating, the pods being large and more visible than the other, and are more in form of a caterpillar.

SCORZONERA. *Tourn. Inst. R. H.* 476. *tab.* 269. *Vipers-grass.*

The *Characters* are,

The common empalement is scaly, cylindrical, and imbricated. The flower is composed of several hermaphrodite florets, which are narrow, tongue-shaped, and indented in five parts. They have five short hair-like stamina, terminated by cylindrical summits. The germen is situated under the floret, supporting a slender style, crowned by two reflexed stigmas. The germen afterward turns to a single, oblong, channelled seed, crowned with a feathery down.

The *Species* are,

1. SCORZONERA *foliis infimis sinuato-dentatis, caulibus linearibus semiamplexicaulis.* Scorzonera with lower leaves indented, those on the stalks linear, and half embracing them with their base.

2. SCORZONERA *caule ramoso, foliis nervosis planis integerrimis.* Scorzonera with a branching stalk, and veined, plain, entire leaves.

3. SCORZONERA *caule subnudo unifloro, foliis nervosis planis.* *Hort. Cliff.* 382. Scorzonera with an almost naked stalk, having one flower, and plain veined leaves.

4. SCORZONERA *foliis lineari-ensiformibus integris carinatis.* *Lin. Sp. Plant.* 791. Scorzonera with linear, sword-shaped, entire leaves, which are keeled.

5. SCORZONERA *foliis lineari-subulatis integris planis, pedunculis cylindricis.* *Lin. Sp. Plant.* 791. Scorzonera with

linear, awl-shaped, entire, plain leaves, and cylindrical foot-stalks.

6. SCORZONERA *foliis subulatis integris, pedunculo incrassato, caule basi villosa.* *Lin. Sp. Plant.* 791. Scorzonera with awl-shaped entire leaves, a thick foot-stalk, and the stalk hairy at its base.

7. SCORZONERA *foliis linearibus multifidis, caule erecto.* Scorzonera with narrow many-pointed leaves, and an erect stalk.

8. SCORZONERA *foliis linearibus pinnatifidis, caulibus procumbentibus.* Scorzonera with narrow many-pointed leaves, and trailing stalks.

The first is the sort which is commonly cultivated in the *English* gardens for food and physick; this grows naturally in *Spain*. The root is Carrot-shaped, about the thickness of a finger, covered with a dark brown skin, is white within, and has a milky juice; the lower leaves are long, ending with a long acute point; they are waved and sinuated at their edges. The stalk rises three feet high, is smooth, branching at the top, and garnished with a few narrow leaves, whose base half embrace the stalk. The flowers terminate the stalks in scaly empalements, composed of many narrow, tongue-shaped, hermaphrodite florets, lying imbricatum over each other, like the scales on fish; they are of a bright yellow colour. After these are decayed, the germen which sits in the common empalement, turns to oblong cornered seeds, having a roundish ball of feathery down at the top.

The second sort is like the first, but the leaves are broader, entire, and are more veined; the stalk does not rise so high, and branches more.

The third sort is shorter than either of the former; the leaves are broader; the stalk is almost naked, and has one yellow flower at the top.

The fourth sort has narrow, keeled, sword-shaped leaves; the stalks are slender; they rise about two feet high, branch toward the top, and sustain pale yellow flowers, which are smaller than those of the former sorts.

The fifth sort has narrow awl-shaped leaves, which are shorter than those of the former; the stalk is taper, and branches at the top; the flowers are of a pale purple colour.

The sixth sort grows a foot and a half high; the leaves are narrow and awl-shaped; the foot-stalk immediately under the flower is thicker than below, and the lower part of the stalk is hairy; the flower is yellow.

The seventh sort rises with a smooth branching stalk two feet high, garnished with narrow leaves, having many winged points, resembling those of Buckshorn Plantain, but larger. The flowers are yellow, and stand upon long naked foot-stalks at the end of the branches.

The eighth sort is exactly like the seventh in every respect, excepting that of the stalks spreading on the ground; which is not accidental, for I have cultivated both sorts above thirty years, and have never found either of them alter.

The first sort only is cultivated for use, the others are preserved in botanick gardens for variety, but are seldom admitted into other gardens.

These plants may be propagated by sowing their seeds the beginning of *April*, upon a spot of light ground. The best method of sowing them is, to draw shallow furrows by a line about a foot asunder, into which you should scatter the seeds, thinly covering them over about half an inch thick, with the same light earth: when the plants are come up, they should be thinned where they are too close in the rows, leaving them at least six inches asunder; and at the same time all the weeds should be cut up. This must be repeated as often as is necessary, for if the weeds are permitted to grow among the plants, they will draw them up weak.

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There are many people who sow these seeds promiscuously in a bed, and afterward transplant them out at the distance they would have them grow; but this is not so good a method as the former, because their roots commonly shoot downright, which, in being transplanted, are often broken, so that they never will make such fair roots as those which remain in the same place where they are sown; for when the extreme part of the root is broken, the milky juice flows out so, it seldom extends itself in length afterwards, but only shoots out into many forked small roots. These roots may be taken up when the leaves begin to decay, at which time they have done growing, though they may remain in the ground until spring, and may be taken up as they are used; but those which remain in the ground after February, will shoot up their flower-stems, after which they are not so good, being sticky and strong.

If you intend to save seeds of these plants, you should let a parcel of the best remain in the places where they grew; and when their stems are grown to their height, they should be supported with stakes, to prevent their falling to the ground, or breaking. In June they will flower, and about the beginning of August their seeds will ripen, when they should be gathered, and preserved dry till the spring following, for use.

SCROPHULARIA. *Tourn. Inst. R. H. 166. tab. 74.* Figwort.

The Characters are,

The flower has a permanent empalement, cut into five parts at the top. It hath one unequal petal, with a large globular tube. The brim is cut into five small parts; the two upper are large and erect; the two side ones spread open, and the under is reflexed. It has four slender deflexed stamina, two of which are the length of the petal, and two are shorter, terminated by twin summits; and an oval germen, supporting a single style, crowned by a single stigma. The germen afterward turns to a roundish pointed capsule with two cells, which open at the top, and are filled with small seeds.

The Species are,

1. SCROPHULARIA *foliis cordatis basi transversis, caule obtusangulo. Lin. Sp. Plant. 619.* Figwort with heart-shaped leaves, whose base are transverse, and a stalk having obtuse angles.

2. SCROPHULARIA *foliis cordatis petiolatis decurrentibus, caule acutangulo, racemis terminalibus. Hort. Upsal. 177.* Figwort with heart-shaped leaves, and an angular membranaceous stalk, terminated by a racemus of flowers.

3. SCROPHULARIA *foliis cordato-oblongis, basi appendiculatis, racemis terminalibus. Læst. Lin. Sp. Plant. 620.* Figwort with oblong heart-shaped leaves, having appendages at their base, and stalks terminated by a racemus of flowers.

4. SCROPHULARIA *foliis cordato-sagittatis, acutè serratis, racemis terminalibus.* Scrophularia with heart shaped arrow-pointed leaves, which are acutely sawed, and stalks terminated by a racemus of flowers.

5. SCROPHULARIA *foliis cordatis serratis, superioribus alternis, racemis axillaribus, pedunculis bifloris.* Figwort with heart-shaped sawed leaves, those on the upper part placed alternate, and bunches of flowers proceeding from the wings of the stalk, with two flowers on a foot-stalk.

6. SCROPHULARIA *foliis cordatis duplicato-serratis, racemo composito. Flor. Leyd. Prod. 296.* Figwort with heart-shaped doubly-sawed leaves, and compound bunches of flowers.

7. SCROPHULARIA *foliis difformibus, pedunculis axillaribus aggregatis. Flor. Leyd. Prod. 292.* Figwort with difformed leaves, and foot-stalks of flowers gathered together at the wings of the stalk.

8. SCROPHULARIA *foliis difformibus laciniatis villosis, racemis compositis axillaribus.* Figwort with difformed, cut, hairy, leaves, and compound bunches of flowers proceeding from the wings of the stalk.

9. SCROPHULARIA *foliis inferioribus pinnatis, summis integris duplicato-serratis, racemis axillaribus.* Figwort with the lower leaves winged, those at the top entire, doubly sawed, and bunches of flowers at the wings of the stalk.

10. SCROPHULARIA *foliis pinnatis, foliolis acutè dentatis, racemis terminalibus.* Figwort with winged leaves, whose lobes are acutely indented, and panicles of flowers terminating the stalk.

11. SCROPHULARIA *foliis linearibus pinnatis lucidis crassis, foliolis pinnatifidis racemis terminalibus.* Figwort with linear winged leaves, which are thick, shining, wing-pointed lobes, and stalks terminated by panicles of flowers.

12. SCROPHULARIA *foliis lanceolato-linearibus acutè serratis, infernè incis, racemo composito. Flor. Leyd. Prod. 294.* Figwort with linear spear-shaped leaves, which are sharply sawed, and a compound racemus of flowers.

13. SCROPHULARIA *foliis cordatis, pedunculis axillaribus solitariis dichotomis. Hort. Cliff. 322.* Figwort with heart-shaped leaves, single foot-stalks proceeding from their wings, which are divided by pairs.

14. SCROPHULARIA *foliis cordatis, superioribus alternis, pedunculis axillaribus bifloris. Hort. Cliff. 322.* Figwort with heart-shaped leaves, the upper of which are alternate, and foot-stalks proceeding from the wings of the stalks, bearing two flowers.

15. SCROPHULARIA *foliis pinnatis, foliolis incis, racemis simplicissimis terminalibus.* Figwort with winged leaves, whose lobes are cut, and a single thyse of flowers terminating the stalks.

16. SCROPHULARIA *foliis ovatis lanceolatis dentatis, racemis terminalibus.* Figwort with oval, indented, spear-shaped leaves, and a racemus of flowers terminating the stalks.

17. SCROPHULARIA *foliis cordatis serratis acutis basi rotundatis, caule obtusangulo. Hort. Upsal. 177.* Figwort with heart-shaped, acute, sawed leaves, which are rounded at their base, with obtuse angles to the stalks.

18. SCROPHULARIA *foliis ovatis acuminatis serratis, ternis caulem ambientibus, floribus corymbosis terminalibus.* Figwort with oval, acute-pointed, sawed leaves, placed by threes round the stalk, which is terminated by globular bunches of flowers.

The first sort grows naturally in woods and under hedges, in most parts of England, so is seldom admitted into gardens; but being a medicinal plant, it is here mentioned to introduce the others. This hath a spreading root, composed of many knobs, from which arise several four-cornered stalks three feet high, garnished with heart-shaped leaves, sawed on their edges; they are placed by pairs, are of a dark green, or brownish colour on their upper side, but pale on their under, having an odour of Elder. The flowers are produced in small clusters from the sides of the stalks opposite, forming a kind of loose spike to the top; they are of one petal, of a dark purple colour, shaped almost like a lip flower; the upper lip or crest being a little arched, the two side segments spread open, and the under segment is recurved. These are succeeded by roundish capsules, ending in acute points, having two cells, filled with small seeds.

The second sort grows naturally by the side of ditches and watery places in most parts of England. This has a fibrous root, sending out strong four-cornered stalks, which grow near four feet high, garnished with heart shaped leaves, rounded at their points, and crenated on their edges, somewhat like those of Betony, from whence it has been titled Water Betony. The flowers are larger than those of the former, and a little redder, but of the same shape. This sort is sometimes used in medicine, but as it grows wild in common, so it is seldom admitted into gardens. There is

a variety of this with variegated leaves, which is by some preserved in gardens.

The third sort grows naturally in *Italy* and *Spain*, by the side of rivers and other moist places. The stalks of this are stronger, taller, and greener than those of the former; the leaves have generally small appendages at their base; the flowers are greener, and grow thinner upon the stalks than those of the former. In these particulars consist their differences.

The fourth sort grows naturally in *Sicily*; this has a fibrous root. The stalks rise near four feet high, and have sharp angles; the leaves are arrow-pointed, heart-shaped, and are sharply sawed on their edges; the flowers terminate the stalks in loose panicles; they are in shape like those of the former, but of a dark red colour.

The fifth sort grows naturally in *Italy*; it has a perennial root. The stalks rise four feet high, branch out on their side, and are garnished with heart-shaped sawed leaves, which on the upper part of the stalk are placed alternate. The flowers are produced in loose panicles at the wings of the stalk, each foot-stalk supporting two flowers; they are small, and of a brown colour.

The sixth sort grows naturally in *Sicily*; this has a perennial root. The stalks rise four feet high, garnished with heart-shaped leaves, which are doubly sawed on their edges; the flowers are disposed in compound spikes, which sit upon long foot stalks, which arise from the wings of the stalks, and have generally two narrow leaves placed at their base, but the flowers terminate the stalks like the three first sorts.

The seventh sort grows naturally in *Spain*; this has a perennial root. The leaves at the bottom are irregularly cut, and have two appendages at their base; they are smooth, of a lucid green, and sawed on their edges. The stalks rise four feet high, four-cornered, smooth, and garnished with oval leaves, some of which are entire, and others have small lobes or appendages at their base. The flowers grow from the wings of the stalks in clusters, each standing upon a separate foot-stalk; they are of a bright red colour with greenish bottoms, and much larger than either of the former.

The eighth sort grows naturally in *Portugal*; this resembles the seventh, but the stalks are larger and rise higher. The leaves are much longer, have four appendages, and are irregularly sawed on their edges, running out into longer points; the whole plant is hairy; the flowers grow in compound bunches at the wings of the stalks; they are larger than those of the former sort, and have a greater mixture of green in them.

The ninth sort grows naturally in *Italy*; this has a root composed of a few thick fleshy fibres. The stalks are slender, four-cornered, and rise about two feet high; the lower leaves are composed of several pinnæ or lobes, which are sharply sawed, but those on the stalks are entire; on the lower part of the stalk they are placed opposite, but toward the top they are alternate and small. The flowers come out in bunches from the wings of the stalk; they are small, of a dark purple colour, with a mixture of green; the seed-vessels are small and roundish.

The tenth sort grows naturally in *Crete*; this hath a root, composed of fleshy fibres. The lower leaves are broad and jagged, not much unlike those of the *Indian Scabious*; the stalks rise three feet high, are four-cornered, green, and smooth, garnished with winged leaves, having very long foot stalks; they are composed of two or three pair of small lobes, terminated by a large one, acutely sawed on their edges, ending in sharp points. The stalks are terminated by slender bunches of small flowers, situated sparsely, of a purplish colour at their rims, edged with white; these

are succeeded by small roundish seed-vessels, filled with very small seeds.

The eleventh sort grows naturally in the kingdom of *Naples*, where it is frequently found upon rocks and old stone walls; this is a biennial plant, which perishes after it has produced ripe seeds. The stalks rise fifteen inches high; they are thick, smooth, and have scarce any corners; the leaves are winged, narrow, of a lucid green, succulent, and divided into many small lobes, which are again divided, and wing-pointed; the flowers are produced in loose panicles on the sides and at the top of the stalk; they are of a dark brown colour, with a mixture of green, and are succeeded by pretty large roundish capsules, filled with angular dark-coloured seeds.

The twelfth sort grows naturally in the *Levant*; this has a perennial creeping root. The stalks rise two feet and a half high; their lower parts are closely garnished with narrow spear-shaped leaves, sharply sawed, and cut at the bottom; the upper part of the stalk is garnished with compound panicles of small brown flowers, which are succeeded by small roundish capsules, filled with small seeds.

The thirteenth sort grows naturally in *Helvetia*; this is a biennial plant, which flowers and produces seeds the second year, and then decays. The lower leaves of this sort are long, heart-shaped, hairy, and of a pale green colour. The stalks rise three feet high, garnished with smaller leaves, of the same shape with those at bottom, placed by threes; the flowers stand upon pretty long foot-stalks; three of these come out at each joint, supporting clusters of pretty large flowers, of a pale yellow colour; these appear in *April*, and are succeeded by oval capsules, filled with small seeds.

The fourteenth sort is a biennial plant, which grows naturally in *Italy*. The leaves of this are heart-shaped, ending in acute points, sawed on their edges, of a lucid green, and on the upper part of the stalk are placed alternate; the foot-stalks of the flowers come out at the wings of the leaves, each sustaining two or three flowers, of a dark red or purple colour.

The fifteenth sort grows naturally in the *Levant*, and also upon *Gibraltar Hill*. The lower leaves of this are doubly winged, variously cut and indented; the stalk is slender, it rises three feet high, the lower part of which is garnished with smaller winged leaves, of a lucid green, indented, and sit close to the stalks; the upper part has very slender panicles of small flowers coming out of the side, and terminate the stalks. The flowers are thinly ranged on the foot-stalks, are very small, and of a purple colour with white borders.

The seeds of the sixteenth sort were sent me from *Zant*; this is also a biennial plant. The stalks are four-cornered, rise two feet high, sending out several small side branches; the leaves are oval, spear-shaped, rounded at both ends, indented on their edges, and stand upon pretty long foot-stalks. The upper part of the stalk is garnished with slender panicles of small flowers, of a bright purple colour.

The seventeenth sort grows naturally in *Maryland*; this hath a perennial fibrous root. The stalks are four-cornered; the leaves are heart-shaped, sharply sawed on their edges, and rounded at their base; the flowers are produced in panicles on the upper part of the stalk, and are like those of the first sort, but of an herbaceous colour.

The eighteenth sort was discovered by the late Dr. *Houfoun* growing naturally at *La Vera Cruz*; this is a biennial plant. The stalk rises two feet high, garnished with oval acute-pointed leaves, sawed on their edges, which sit close to the stalks; those at the bottom and top of the stalk are placed by pairs, but in the middle there are three leaves at each joint, of a pale green; at the top of the stalk the
flowers

flowers are produced in roundish bunches; they are about the size of those of the first sort, of a fine scarlet colour. This sort flowered in the *Chelsea* garden, but did not perfect its seeds.

These plants are propagated by seeds, which, if sown in the spring, the plants seldom rise the same season. Some of them may come up in autumn, and others the spring following, but, if they are sown in autumn, soon after they are ripe, the plants will come up the spring following. They may be sown in the place where the plants are to remain, for they are all of them hardy enough to bear the cold of our ordinary winters in the open air (except the last sort which is tender). When the plants come up, they will require no other care but to thin them where they are too close, and keep them clear from weeds. The second year the plants will flower and produce ripe seeds; after which those sorts which are biennial will die, but the others will continue some years.

The seventh and eighth sorts are ornamental plants, so may be allowed to have a place in the pleasure-garden, where, when the plants are strong, they will make a good appearance during their continuance in flower, which generally lasts two months, unless the season proves very hot and dry. The roots of these sorts will abide some years, unless by a very severe winter they are destroyed; but, as young plants flower stronger than the old ones, there should be a succession of them annually propagated by seeds.

The last sort is too tender to live through the winter in the open air in this country. The seeds should be sown in pots in autumn, which may be sheltered under a common frame in winter, and in the spring plunged into a moderate hot-bed, which will bring up the plants. When these are fit to remove, they should be planted into separate small pots, and plunged into a very moderate hot-bed, shading them from the sun till they have taken new root; after which they must be gradually hardened to bear the open air, into which they may be removed the latter end of *June*, placing them in a sheltered situation, where they may remain till *September*, when they should be removed into shelter before any morning frosts come on, and in winter they must be placed in a stove, kept moderately warm, where they will thrive and produce flowers the following summer.

SCUTELLARIA, *Lin. Gen. Plant.* 653. Skull-cap.

The Characters are,

The flower has a very short tubulous empalement, whose brim is entire, having an incumbent scaly operculum which seems closed; it is of the lip kind, with a very short crooked tube, long compressed chaps, and a concave trifid upper lip; the under lip is broad and indented; it has four stamina hid under the upper lip, two of which are longer than the other, terminated by small summits, and a four-pointed germen, supporting a slender style situated with the stamina, crowned by a single recurved stigma. The empalement afterward becomes a helmet-shaped capsule, including four seeds which are roundish.

The Species are,

1. SCUTELLARIA *foliis subcordatis serratis, spicis interruptis.* *Hort. Cliff.* 317. Skull-cap with almost heart-shaped sawed leaves, and interrupted spikes of flowers.

2. SCUTELLARIA *foliis cordatis obtusis obtusèque serratis, spicis foliosis.* *Prod. Leyd.* 311. Skull-cap with obtuse heart-shaped leaves, which are bluntly sawed, and leafy spikes of flowers.

3. SCUTELLARIA *foliis cordato-oblongis acuminatis serratis, spicis subnudis.* *Lin. Sp. Plant.* 600. Skull-cap, with oblong, acute pointed, heart-shaped, sawed leaves, and almost naked spikes of flowers.

4. SCUTELLARIA *foliis incisis, subtus tomentosis.* *Hort. Upsal.* 173. Skull-cap with cut leaves, which are woolly on their under side.

5. SCUTELLARIA *foliis ovatis sessilibus, interioribus obsolete serratis, superioribus integerrimis.* *Lin. Sp. Plant.* 599. Skull-cap with oval leaves sitting close to the stalks, the under of which are sometimes sawed, and the upper entire.

6. SCUTELLARIA *foliis inciso-serratis utrinque glabris, spicâ rotundato-tetragonâ.* *Hort. Upsal.* 173. Skull-cap with sawed cut leaves, which are smooth on both sides, and a roundish four-cornered spike of flowers.

The first sort grows naturally in *Italy*. Mr. Ray observed it about *Leghorn* and *Florence*, in the hedges and uncultivated places in plenty; this hath a perennial root; the stalk is four-cornered, hairy, and rises two feet high, garnished with heart shaped leaves placed opposite, sawed on their edges. The flowers grow in interrupted spikes at the top of the stalks, of a purple colour in some, and in others they are white.

The second sort grows naturally in *Crete*; this hath a ligneous stalk, which rises about two feet high, sending out slender side branches, garnished with obtuse heart-shaped leaves, bluntly sawed on their edges; they are hoary on their under side, and of a light green on their upper. The flowers are disposed in pretty long spikes at the top of the stalks; they are white, and have small leaves growing between them.

The third sort grows naturally in the *Levant*; this hath a perennial root. The stalks rise from three to four feet high, sending out a few slender branches from their sides, garnished with oblong heart-shaped leaves, ending in acute points, sawed on their edges. The flowers are disposed in naked spikes at the top of the stalks; they are purple, and have longer tubes than any of the other sorts.

The fourth sort grows naturally in the *Levant*; this is a perennial plant, with shrubby stalks which spread on the ground, garnished with cut leaves placed opposite, which are almost triangular, of a light green on their upper side, and downy on their under, standing upon slender foot-stalks. The flowers are disposed in short spikes at the end of the branches, of a bright yellow colour, and are succeeded by gray seeds which ripen in the empalement.

The fifth sort grows naturally in *North America*; it has a perennial root, from which come forth several four-cornered stalks, two feet high, sending out side branches. The lower leaves are heart-shaped, sawed on their edges, standing upon pretty long foot-stalks; the upper leaves are oval and entire. The flowers are disposed in very long loose spikes at the end of the branches, of a blue colour; these are succeeded by seeds which ripen in the empalement.

The sixth sort grows naturally on the *Alps* and *Apennines*; the stalks of this are shrubby, trailing on the ground, the leaves are smooth and cut on their edges; the flowers are disposed at the top of the stalks in roundish four-cornered spikes; in one they are white, and in another variety they are blue; they are larger than the flowers of any other known species, so make a pretty appearance in gardens.

These plants are all of them propagated by seeds; if these are sown in autumn, soon after they are ripe, they will more certainly succeed than when they are sown in the spring, for these sometimes miscarry, and, if they succeed, the plants seldom come up the same season. The seeds may either be sown where the plants are to remain, or in a border to be afterward removed; but, as the fourth sort does not bear transplanting well, unless they are removed young, the seeds of that had better be sown where the plants are to stand; this should be on a dry warm border of poor earth, where the plants will live much longer, and make a better appearance than on a rich soil. When the plants come up, they will require no other care but to thin them, and keep them clear from weeds.

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When the other sorts come up, and are fit to remove, they may be transplanted into a nursery-bed at five or six inches distance, where they may stand till autumn, but must be kept clean from weeds during that time; then they may be transplanted into the borders of the flower-garden where they are to remain.

As these plants are not of long duration, it will be proper to sow a succession of seeds every other year at least, to supply the places of those which decay.

SECALE. *Tourn. Inst. R. H.* 513. *tab.* 294. Rye.

The Characters are,

There are two flowers in each involucre; they have two leaves which are opposite, narrow, erect, and sharp-pointed. The petals have two leaves; the outer valve is rigid, bellied, acute-pointed, and compressed; the lower border is hairy, ending in a long awn, the inner is plain and spear-shaped; they have two oval erect nectariums, and three hair-like stamina, hanging without the flower, terminated by oblong forked summits, with a top-shaped germen supporting two reflexed hairy styles, crowned by a single stigma. The germen afterward becomes an oblong almost cylindrical seed which ripens in the empalement.

We have but one distinct Species of this genus which is cultivated in England, though it is often supposed the two varieties are essentially different; but, from several years cultivating them on the same land, I could find no real difference between them. Dr. *Linnaeus* titles this *Secale glumarum ciliis scabris*, *Hort. Upsal.* 22. Rye with rough hairs to the awns.

The farmers distinguish the two varieties by the titles of Winter and Spring Rye; but, when these are sown three or four years, at the same season, and on the same soil, it will be difficult to know them asunder; but, where Rye is sown upon a warm land, it will ripen much earlier than on cold stiff ground, and by continuing it two or three years, it will be forwarded so much, as to ripen a month earlier than the seeds which have long grown upon a strong cold soil; so those, who are obliged to sow Rye toward spring, generally provide themselves with this early seed.

There are several kinds of grass, which are now ranged under this generical title; but, as these do not merit cultivation, I shall not trouble the reader with the mention of them here.

Rye is so well known to every one who is the least acquainted with the different grains, as to need no description.

The winter Rye is what the generality of farmers propagate; it is usually sown in autumn at the same season with Wheat, and in many of the northern counties, as also in *Wales*, they are often mixed together, though I think it must be very bad husbandry, for the Rye will always ripen sooner than Wheat, so that, if the latter is permitted to be fully ripe, the former will shatter; nor can this be practised where the people are not accustomed to eat Rye bread; for although it is by some accounted good when mixed, yet being so very clammy, few people, who have been fed with Wheat, will ever care to eat the bread made of this.

It is generally sown on poor, dry, gravelly, or sandy land, where Wheat will not thrive, and in such places may answer very well; but on such land as will bear Wheat, it is not proper to sow Rye, as the value of it is greatly inferior to that of Wheat.

When Rye is sown, the ground should not be too wet; and if it should happen, that much rain falls before the Rye is come up, it often rots in the ground; but it is not long in coming up, it being much sooner out of the ground than Wheat.

The small Rye may be sown in the spring, about the same time with Oats, and is usually ripe as soon as the other sort; but if the season proves wet, it is apt to run much to straw;

and the grain is generally lighter than the other, so the only use of this sort is to sow upon such lands where the autumnal crop may have miscarried.

Rye is also sown in autumn to afford green feed for ewes and lambs in the spring, before there is plenty of grass. When this is intended, the Rye should be sown early in autumn that it may have strength to furnish early feed. The great use of this is to supply the want of Turneps in those places where they have failed, as also, after the Turneps are over, and before the grass is grown enough to supply green feed for the ewes; so that in those seasons, when the Turneps in general fail, it is very good husbandry to sow the land with Rye, especially where there are stocks of sheep, which cannot be well supported where green feed is wanting early in the spring; therefore those farmers, who have large live stocks, should have several methods of supplying themselves with sufficient feed, lest some should fail; for, as Turneps are a very precarious crop, some land should be sown with Cole seed, which will supply the want of Turneps in winter; and, if some of the ground, which was sown late with Turneps which had failed, was sown in autumn with Rye, that would be fit to supply the want of Cole seed afterward.

SECURIDACA. *Tourn. Inst. R. H.* 399. *tab.* 224. Hatchet-vetch.

The Characters are,

The empalement of the flower is short, compressed, and cut into two segments; the flower is of the butterfly kind; the standard is heart-shaped, reflexed on both sides, and scarce longer than the wings; these are oval, joining at the top, but open at the bottom, the keel is compressed and pointed. It hath ten stamina, nine joined, and one separate, terminated by small summits, and an oblong compressed germen, with a bristly style, crowned by an obtuse stigma. The germen afterward turns to a long, compressed, sword-shaped pod, with a thick border on one side, plain on the other, opening in two cells filled with square seeds.

We have but one Species of this genus at present, which is the

SECURIDACA *herbacea, leguminibus falcato-gladiatis.* Herbaceous Hatchet-vetch, with hooked sword-shaped pods.

This plant grows naturally in the Corn fields in *Spain* and *Italy*; it is annual, and hath trailing herbaceous stalks, which grow a foot and a half long, dividing into many branches, which spread on the ground, garnished with winged leaves, composed of seven or eight pair of oval obtuse lobes terminated by an odd one, of a deep green and smooth. From the wings of the leaves arise the foot-stalks of the flowers, by pairs at each joint, which are five or six inches long, sustaining at the top a large cluster of yellow flowers of the butterfly kind, succeeded by compressed pods near four inches long, ending in acute points, having a suture on each side, one plain and the other rising, joined at their base to the foot-stalk, but spread open like the rays of a star, and are divided by a longitudinal partition into two cells, each containing a row of square flat seeds of a reddish colour.

It is propagated by sowing the seeds in borders of light earth in the spring, in the places where the plants are to abide, for they seldom succeed well if they are transplanted; they should be allowed at least two feet distance, because their branches trail upon the ground. When the plants come up, they will require no other care, but to thin them where they are too close, and keep them clean from weeds. A few of these plants may be admitted into every good garden for variety, though there is no great beauty in their flowers.

SEDUM. *Lin. Gen. Plant.* 513. Houseleek.

The Characters are,

The empalement of the flower is permanent, and cut into five acute parts. The flower has five plain, spear shaped, acute-pointed petals, and five nectariums, with small single scales indented at the top, each being inserted at their base to the outside of the germen; it has ten awl-shaped stamina, the length of the petals, terminated by roundish summits, and five oblong germen ending in slender styles, crowned by obtuse stigmas. The germen afterward become five erect, spreading capsules, which are compressed, acute-pointed, opening from top to bottom, filled with small seeds.

The Species are,

1. *SEDUM foliis oblongis obtusis teretiusculis sessilibus patentibus, cymâ ramosâ.* Hort. Cliff. 177. Houseleek with oblong, obtuse, taper leaves, sitting close to the stalks, spreading open, and a branching stalk.
2. *SEDUM foliis oppositis ovatis obtusis carnosiss, caule infirmo, floribus sparsis.* Lin. Sp. Plant. 431. Houseleek with oval, fleshy, blunt leaves, which are placed opposite, a weak stalk, and flowers growing thinly.
3. *SEDUM foliis subulatis confertis basi membranaceâ solutis, floribus sinosis.* Hort. Cliff. 176. Houseleek with awl-shaped leaves growing in clusters, whose base has a loose membrane, and flowers growing from the top of the branches.
4. *SEDUM foliis subulatis carnosiss patentibus, caule dichotomo, cymis erectis.* Houseleek with fleshy, awl-shaped, spreading leaves, a stalk divided by pairs, and erect tops.
5. *SEDUM foliis subovatis adnato-sessilibus gibbis erectiusculis alternis, cymâ trifidâ.* Hort. Cliff. 177. Stone Crop with oval, gibbous, erect, alternate leaves sitting close to each other, and a trifid top; or Wall Pepper.
6. *SEDUM foliis subcylindricis obtusis alternis, cymâ semper erectâ.* Lin. Sp. Plant. 432. Houseleek with obtuse almost cylindrical leaves, which grow alternate, and the top always erect.
7. *SEDUM caule erecto solitario annuo, foliis ovatis sessilibus gibbis alternis, cymâ recurvâ.* Flor. Suec. 319. Houseleek with an erect, annual, single stalk, oval gibbous leaves, which are placed alternate, and a recurved top.
8. *SEDUM caulibus decumbentibus, foliis subulatis carnosiss patentibus, floribus paniculatis reflexis.* Stone Crop with trailing stalks, awl-shaped, fleshy, spreading leaves, and flowers growing in reflexed panicles.
9. *SEDUM foliis subovatis adnato-sessilibus gibbis erectiusculis sexfariâ imbricatis.* Flor. Suec. 390. Stone Crop with almost oval, gibbous, erect leaves growing close to each other, and imbricated six ways.
10. *SEDUM caule erecto, foliis planiusculis, pedunculisque subpilosis.* Lin. Sp. Plant. 432. Houseleek with an erect stalk, plain leaves, and foot-stalks which are somewhat hairy.
11. *SEDUM foliis planiusculis angulatis, floribus lateralibus subsessilibus solitariis.* Hort. Cliff. 176. Houseleek with plain angular leaves, and single flowers sitting close to the sides of the stalk.
12. *SEDUM foliis planis, caule ramoso, floribus paniculatis.* Hort. Cliff. 176. Houseleek with plain leaves, a branching stalk, and flowers growing in panicles.
13. *SEDUM foliis lanceolatis serratis planis, caule erecto, cymâ sessili terminali.* Lin. Sp. Plant. 430. Houseleek with plain, spear-shaped, sawed leaves, and an erect stalk, terminated by a head of flowers sitting close to it.
14. *SEDUM foliis oblongo-ovatis carinatis supernè serratis, corymbo terminali.* Houseleek with oblong, oval, keeled leaves, which are sawed on their upper part, and a stalk terminated by a corymbus of flowers; common Orpine, or Live-long.
15. *SEDUM foliis planiusculis serratis, corymbo folioso, caule erecto.* Lin. Sp. Plant. 430. Houseleek with plain sawed leaves, a leafy corymbus of flowers, and an erect stalk.

16. *SEDUM foliis ternis planiusculis serratis, caule erecto corymbo terminali.* Houseleek with plain sawed leaves growing by threes, and an erect stalk terminated by a corymbus.

17. *SEDUM foliis ovatis integerrimis, summis amplexicaulis, corymbo terminali.* Houseleek with oval entire leaves, which at the top embrace the stalk, and a corymbus of flowers terminating the branches.

18. *SEDUM foliis cuneiformibus integerrimis, caulibus decumbentibus, floribus corymbosis.* Lin. Sp. Plant. 430. Houseleek with wedge-shaped entire leaves, trailing stalks, and flowers growing in a corymbus.

The first sort grows naturally upon old walls in many parts of *England*, so is seldom planted in gardens, but, as it is a medicinal plant, I have placed it here. This hath slender trailing branches, garnished with taper succulent leaves about half an inch long, standing alternately round the branches. The flower-stalks rise four or five inches high; their lower part is garnished with leaves, which spread horizontally; the upper part of the stalk divides into small foot-stalks, supporting many white star-pointed flowers, gathered into a sort of umbel.

The second sort also grows upon old walls in many parts of *England*. The stalks of this are very slender and infirm; the leaves are very short, oval, and of a gray colour, placed opposite. The flowers are set thinly at the top of the stalks; they are small, white; their petals are obtuse; the summits upon the stamina are pretty large, and of a bright purple colour.

The third sort grows naturally upon *St. Vincent's Rock* near *Bristol*, and in several parts of *Wales*. This has slender purple stalks, which trail upon the ground, closely garnished with short awl-shaped leaves, placed round the stalks, having a short loose membrane at their base, which falls off on being touched; the leaves toward the top of the stalk fit close together; they are of a sea-green colour, and not very succulent. The flowers grow at the top of the stalks in roundish bunches, of a bright yellow colour. This plant, when it is once placed upon a wall, will propagate itself in plenty by its trailing branches, which put out roots from their joints.

The fourth sort grows naturally in *Spain*. This is an annual plant with upright stalks, which rise three or four inches high, garnished with fleshy awl-shaped leaves, of a gray colour. The top of the stalk divides into two slender erect branches, which have small, white, star-pointed flowers ranged above each other, and the top of the stalk at the division of the branches is terminated by two or three flowers sitting close. If the seeds are permitted to scatter, the plants will come up without care.

The fifth sort is the common Stone Crop or Wall Pepper, so called for the acrid biting quality of the leaves. This grows very common upon old walls and buildings in every part of *England*, and is so well known as to require no description. There are two varieties of this, one with a large, and the other a small yellow flower.

The sixth sort grows upon moist rocks in several parts of *France* and *Germany*, and is seldom seen in gardens. This rises with an erect stalk three inches high, garnished with obtuse, cylindrical, succulent leaves. The stalk divides upward into three or four branches, which sustain small purplish flowers, standing erect.

The seventh sort grows naturally on dry barren rocks in the north of *England*. This is an annual plant with an erect stalk, garnished with oval leaves, placed alternate. The stalk seldom rises above two or three inches high; the leaves sit close to the stalks, and are of a grayish colour; the flowers grow at the top of the stalk in a reflexed spike; they are small and white.

The eighth sort grows naturally upon old walls and buildings in most parts of *England*, and is by some called Prick-Madam. This has long trailing stalks, garnished with fleshy awl-shaped leaves, spreading out almost horizontally, of a gray colour, ending in acute points. The flowers grow in reflexed bunches at the top of the stalks; they are star-pointed, and of a bright yellow colour.

The ninth sort is less common than either of the former. I have found it growing upon the rocks in *Wales*. This hath the appearance of common Stone Crop, but the stalks and leaves are larger, and have no biting taste; the leaves are ranged in six rows, like the grains of the six-rowed Barley; the flowers are yellow, and larger than those of the common Stone Crop.

The tenth sort grows naturally upon moist rocks and boggy soils in several parts of the north of *England* and in *Wales*; this seldom rises more than two or three inches high. The stalks are garnished with a few plain hairy leaves, terminated by purple flowers growing thinly.

The eleventh sort grows naturally in *Italy* and *Germany*; this is a low annual plant. The leaves are plain and angular; the stalks rise three inches high, dividing at the top into two or three parts; the flowers come out singly from the side of the stalk; they are white, star-pointed, and are succeeded by star-pointed rough capsules.

The twelfth sort is an annual plant, which grows naturally in the south of *France* and in *Italy*; this hath plain succulent leaves. The stalks rise six or seven inches high, dividing into smaller branches, which sustain small white flowers, growing in large panicles; and if the seeds are permitted to scatter, the plants will come up without care. This loves a warm dry soil.

The thirteenth sort grows naturally in *Siberia*; this has a perennial root, from which come out several stalks near a foot high, garnished with spear-shaped, plain, thick leaves, placed alternately, slightly sawed on their edges. The stalk is terminated by a flat corymbus of flowers, of a bright yellow colour, fitting close on the top of the stalks.

The fourteenth sort is the common Orpine, which grows naturally in woods and shady places in many parts of *England*. Of this there are two varieties, one with white, the other with purple flowers. This has a perennial root, composed of many glandulous knobs, from which come out round succulent stalks two feet high, dividing toward the top into smaller branches, garnished with fleshy, oval, oblong leaves, a little keel-shaped, of a gray colour, and sawed toward their points. The stalk is terminated by a corymbus of flowers, which are star-pointed; in some they are white, and in others purple.

The fifteenth sort is not common in the *English* gardens; this hath roots like the former. The stalks grow more erect, of a purple colour; the leaves are flatter, and more sawed on their edges, of a dark green colour, and thicker substance; the flowers are purple.

The sixteenth sort has strong, succulent, erect stalks, which are purple, and rise higher than either of the former. The leaves are larger, of a dark green colour, sawed on their edges, and stand by threes round the stalk; the flowers are purple, collected into a large corymbus, terminating the stalk.

The seventeenth sort grows naturally in *Portugal*. There are two varieties of this, one with white, and the other with purple flowers. The roots of this are composed of many thick fleshy knobs; the stalks are thick, succulent, and round; they rise three feet high, garnished with oval succulent leaves, which are entire, placed by pairs; those on the upper part embrace the stalk with their base; they are of a pale herbaceous colour. The flowers are collected in large bunches, which terminate the stalks.

The eighteenth sort grows naturally in *Italy*. The roots

of this are fibrous; the stalks trail on the ground, garnished with wedge-shaped leaves, standing alternately round the stalks. The flowers are disposed in a compact corymbus, which fits close on the top of the stalks; they are star-shaped, of a purple colour, and appear in *July*.

All the sorts of Stone Crop are easily propagated by planting their trailing stalks either in spring or summer, which soon put out roots; but, as these thrive much better upon rocks, old walls, or buildings, than in the ground, they may be disposed upon rock-work in such a manner as to have a good effect. If the cuttings or roots of the perennial sort are planted in some soft mud laid upon the walls or buildings, they will soon take root, and then spread into every joint or crevice, and in a short time will cover the place, and, if the seeds of those annual sorts, which grow naturally in dry places, are sown soon after they are ripe on the top of walls, the plants will come up, and maintain themselves without farther care.

The several sorts of Orpine may be easily propagated by cuttings during the summer months, or by parting of their roots either in spring or autumn; these thrive best in a dry soil and a shady situation, but may also be planted for the same purposes as the other sorts, especially the eighteenth sort, which is ever-green. The stalks of this kind hang down, and have a very good effect in rock-work, and the plants require no care, for when they are fixed in the place, they will spread and propagate fast enough.

The stalks of the common Orpine are frequently cut in summer, and fastened to laths of the size of chimney-boards, which, being framed together, are used for screening the sight of the fire-grates in rooms; these stalks will shoot and spread over the frame, and, if the frames are taken out once a week, and the stalks watered over to refresh them, they will continue in verdure for two months.

SEED. The seed of a plant consists of an embryo, with its coat or cover. The embryo, which contains the whole plant in miniature, and which is called the germ or bud, is rooted in the placenta or cotyledon, which makes the coat or involucrum, and serves the same purposes as the secundines, *i. e.* the chorion and amnis in animals.

The placenta or cotyledon of a plant is always double, and in the middle and common center of the two is a point or speck, which is the embryo or plantule. This plantule, being acted on and moved by the warmth of the sun and the earth, begins to expand, and protrudes or shoots out its radicle or root both upward and downward. By this it absorbs the nutritious juice from the earth, and so grows and increases, and, the requisite heat continuing, the growth continues.

The two placentulæ or cotyledons of a seed are, as it were, a case to this little tender plantule or point, covering it up, sheltering it from injuries, and feeding it from their own proper substance; which the plantule receives and draws to itself, by an infinite number of little filaments or ramifications, called Funes Umbilicales, or Navel Strings, which it sends into the body of the placenta.

The cotyledons, for the most part, abound with a balsam, disposed in proper cells; and this seems to be oil brought to its greatest perfection, while it remains humid, and then lodged in these repositories; one part of the composition of this balsam is oily and tenacious, and serves to defend the embryo from any extraneous moisture, and, by its viscosity, to entangle and retain that fine, pure, volatile spirit, which is the ultimate production of the plant.

This oil is never observed to enter into the vessels of the embryo, which are too fine to admit so thick a fluid. The spirit, however, being quickened by an active power, may possibly breathe a vital principle into the juices that nourish the embryo, and stamp upon it the character that distinguishes

distinguishes the family; after which every thing is changed into the proper nature of that particular plant. That this spirit now is truly the efficacious part, is evident; for when that is gone off, the oil that remains is quite vapid and inactive. It is this that gives plants their fragrant smell and peculiar tastes, nor do their particular colours a little depend upon it.

Now when the seed is committed to the earth, the placenta still adheres to the embryo for some time, guards it from the access of noxious colds, &c. and even prepares and purifies the cruder juice the plant is to receive from the earth, by straining it, &c. through its own body.

This it continues to do, till the placentula being a little inured to its new element, and its root tolerably fixed in the ground, and fit to absorb the juice thereof, it then perishes, and the plant may be said to be delivered; so that nature observes the same method in plants contained in fruits, as in animals in the mother's womb.

It is very surprising, that many sorts of seeds will continue good for several years, and retain their growing faculty, whereas many other sorts will not grow when they are more than one year old; which is, in a great measure, owing to their abounding more or less with oil, as also the nature of the oil, whether it is of a cold or hot quality, and the texture of their outward covering. As for example; the seeds of Cucumbers, Melons, and Gourds, which have thick horny coverings, and the oil of this seed being of a cold nature, the seeds will continue good ten, fifteen, or twenty years; and Radish, Turnep, Rape, &c. with other oily seeds (whose coats, though they are not so hard and close as the others, yet) abounding with oil, which is of a warmer nature, the seeds will keep good three or four years; whereas the seeds of Parsley, Carrots, Parsneps, and most other umbelliferous plants, whose seeds are, for the most part, of a warm nature, lose their growing faculty often in one year, but seldom remain good longer than two years. Indeed all sorts of seeds are preserved best, if kept in the pods or husks wherein they grow; especially if they are not separated from the placenta, to which they are fastened by an umbilical cord, through which they received their nourishment in their embryo state; so that whoever would send seeds to a distant country, should always take care they are full ripe before they are gathered, and that they are preserved in their pods or husks; and when they are packed up for exportation, there should be great care taken, that they are not shut up too closely from the air, which is absolutely necessary to maintain the principle of vegetation in the seed (though in a less degree) as it is to nourish the plant when germinated, as I found by trying the following experiment, *viz.* Having saved a parcel of fresh seeds of several kinds, I took some of each kind, and put into glass phials; these I stopped down close, and sealed hermetically, then put them up in a trunk; the other parts of the same seeds I put into bags, and hung them up in a dry room, where the air had free admittance, in which place they remained a whole year; and the following spring I took out a part of each parcel of seeds from the phials, as also from the bags, and sowed them at the same time, and upon the same bed, where they had an equal advantage of the sun, air, &c. The result of this experiment was, that almost all the seeds which I took out of the bags, grew extremely well, but of those which were kept in the phials, not one come up; after which I sowed the remaining part of the seeds in the phials, but had not one single plant from the whole, whereas those preserved in the bags grew very well both the second and third years. And this experiment was afterward tried by one of my particular friends, with whom the effect was the same as with me. Some years after this, a gentleman of great eminence for his

knowledge of plants, being very desirous to procure seeds from every country, where the *British* nation had any commerce, gave his instructions to many of the agents abroad, to send him over all the sorts of seeds they could collect in their different countries, and to put them up in bottles, sealing the mouths of the bottles as close as possible, to exclude the air; which was done by several of his correspondents, who sent him great quantities of seeds, but not one of them grew when they were sown; so that those persons who send seeds to a distant country, should never be guilty of the like error.

How the vegetative life is so long preserved in seeds, when they are deeply immersed in the ground, is very difficult to explain; but as it is very notorious, that earth taken from the bottom of vaults, houses, and wells, and from the earth which has been taken at a very great depth in those places, there have been many plants produced, which were not inhabitants of the neighbouring soil; and this has been brought as a proof to support the doctrine of spontaneous productions, by some who have asserted, that plants are often produced without seed.

SELAGO. *Lin. Gen. Plant.* 687.

The Characters are,

The flower has a permanent empalement of one leaf, cut into four parts at the top. The flower is of one petal; it has a very small tube; the brim is spreading, and cut into five parts; the two upper segments are the least. It hath four hair-like stamina the length of the petal, to which they are inserted, two of which are longer than the other, terminated by single summits; and a roundish germen, supporting a single style, crowned by an acute stigma. The germen afterward becomes a single seed, wrapped up in the petal of the flower.

We have but one Species of this genus at present in the English gardens, *viz.*

SELAGO *corymbo multiplici.* *Lin. Sp. Plant.* 629. Selago with a multiplied corymbus.

This plant grows naturally at the *Cape of Good Hope.* It has slender ligneous stalks, which rise seven or eight feet high, but are so weak as to require support; they send out many slender branches, garnished with short, linear, hairy leaves, that come out in clusters from the same point. The flowers terminate the stalks in umbels, the general umbel being composed of a multiplicity of small umbels of white flowers, which appear in *July* and *August*, but are not succeeded by seeds in *England.*

This plant is preserved in gardens more for the sake of variety than for its beauty, for the branches grow very irregular, and hang downward; the leaves are small, so make little appearance, and the flowers are so small as not to be distinguished at any distance.

It is propagated by cuttings, which put out roots freely, if they are planted in any of the summer months; if these are planted in a bed of fresh earth, and covered close down with a bell or hand-glass, shading them from the sun, and refreshing them now and then with water, they will soon put out roots; then they must be gradually hardened, and afterward transplanted into small pots, placing them in the shade till they have taken new root; then they may be placed with other hardy green-house plants, where they may remain till the end of *October*, when they must be removed into shelter, for these plants will not live in the open air in *England*; but they only require protection from hard frost; so they should be treated in the same way as other of the hardiest kinds of green-house plants.

SELINUM. *Lin. Gen. Plant.* 300. Milky Parsley.

The Characters are,

It has an umbellated flower; the general umbel is plain and spreading; the particular umbels are the same; the involucreum is composed of many linear spear shaped leaves, which spread open; the umbel is uniform; the flowers have five inflexed heart-

shaped petals, which are unequal, and five hair-like stamina, terminated by roundish summits. The germen is situated under the flower, supporting two reflexed styles, crowned by single stigmas; it afterward becomes a plain compressed fruit, channelled on both sides, parting in two, containing two oblong elliptical plain-seeds, channelled in the middle, and have membranes on both sides.

The Species are,

1. SELINUM *radice fusiformi multiplici*. Milky Parsley with spindle-shaped roots.

2. SELINUM *sublaetescens radice unica*. Haller. Helv. 443. Selinum which is almost milky, having a single root.

The first sort grows by the sides of lakes and standing waters in several parts of Germany; this hath many spindle-shaped roots hanging by fibres, which spread and multiply in the ground. The stalks rise five or six feet high; they are streaked, and of a purple colour at bottom, sending out several branches toward the top; the leaves are finely divided like those of the Carrot, and when broken, there issues out a milky juice; the stalks are terminated by umbels of whitish flowers, which come out in June, and are succeeded by compressed bordered seeds, which ripen in August.

The second sort grows naturally in marshy places in Germany. The leaves of this are much longer and cut into narrower segments than those of the former; the stalks rise higher; the umbels are larger, as are also the seeds. The whole plant abounds with a caustick milky juice.

These plants are preserved in botanick gardens for variety, but are rarely cultivated any where else; they are easily propagated by seeds, which should be sown in autumn, and the plants afterward treated in the same way as Angelica.

A SEMINARY is a seed-plot, which is adapted or set apart for the sowing of seeds. These are of different natures and magnitudes, according to the several plants intended to be raised therein. If it be intended to raise forest or fruit-trees, it must be proportionably large to the quantity of trees designed, and the soil should be carefully adapted to the various sorts of trees. Without such a place as this every gentleman is obliged to buy, at every turn, whatever trees he may want to repair the losses he may sustain in his orchard, wilderness, or larger plantations, so that the necessity of such a spot of ground will easily be perceived by every one; but, as I have already given directions for preparing the soil, and sowing the seeds in such a seminary, under the article of NURSERY, I shall not repeat it in this place, but refer the reader to that article.

It is also as necessary for the support of a curious flower-garden, to have a spot of ground set apart for the sowing of all sorts of seeds of choice flowers, in order to obtain new varieties, which is the only method to have a fine collection of valuable flowers; as also for the sowing of all sorts of biennial plants, to succeed those which decay in the flower-garden; by which means the borders may be annually replenished, which, without such a seminary, could not be so well done.

This seminary should be situated at some distance from the house, and be entirely closed either with a hedge, wall, or pale, and kept under lock and key, that all vermin may be kept out, and that it may not be exposed to all comers and goers, who many times do mischief before they are aware of it. As to the situation, soil, and manner of preparing the ground, it has been already mentioned under the article of NURSERY, and the particular account of raising each sort of plant being directed under their proper heads, it would be needless to repeat it here.

SEMPERVIVUM. Lin. Gen. Plant. 538. Houseleek.

The Characters are,

The flower has a concave empalement, cut into many acute segments; it has ten oblong, spear-shaped, pointed petals, and twelve or more narrow awl-shaped stamina, terminated by roundish summits; it has twelve germen, placed circularly, sitting upon so many styles, which spread out, and are crowned by acute stigmas. The germen afterward becomes so many short compressed capsules, pointed on the outside, and open on the inside, filled with small seeds.

The Species are,

1. SEMPERVIVUM *foliis ciliatis, propaginibus patentibus*. Lin. Sp. Plant. 464. Houseleek with hairy-edged leaves, and spreading offsets; or common large Houseleek.

2. SEMPERVIVUM *foliis ciliatis, propaginibus globosis*. Lin. Sp. Plant. 464. Houseleek with hairy-edged leaves, whose offsets are globular.

3. SEMPERVIVUM *foliis integerrimis, propaginibus patulis*. Lin. Sp. Plant. 465. Houseleek with entire leaves and spreading offsets.

4. SEMPERVIVUM *foliis pilis intertextis, propaginibus globosis*. Lin. Sp. Plant. 465. Houseleek with threads from leaf to leaf, and globular offsets; commonly called Cobweb Sedum.

5. SEMPERVIVUM *caule arborecente lævi ramoso*. Lin. Sp. Plant. 464. Houseleek with a smooth, tree-like, branching stalk; or Tree Houseleek.

6. SEMPERVIVUM *caule foliorum rudibus lacero, foliis retusis*. Lin. Sp. Plant. 464. Houseleek with stalks torn by the rudiments of the leaves, and blunt-pointed leaves.

7. SEMPERVIVUM *foliorum marginibus serrato-dentatis, propaginibus patulis*. Houseleek with leaves, whose borders are indented like a saw, and spreading offsets.

The first sort is our common Houseleek, which is seen in every part of England growing on the tops of houses and walls, but is not a native of this country; it has many thick succulent leaves set together in a round form; they are convex on their outside and plain within, sharp-pointed, and their borders are set with short fine hairs. The leaves spread open, and lie close to the earth, sending out on every side offsets of the same form. From the center of these heads arise the flower-stalk, which is about a foot high, succulent and round, of a reddish colour, garnished at bottom with a few narrow leaves; the upper part of the stalk divides into two or three parts, each sustaining a spike or range of reflexed flowers, composed of several petals, which spread open, ending in acute points, of a red colour; in the center is situated the germen, which are placed circularly, and, after the petals are fallen off, they swell and become so many horned capsules, filled with small seeds.

This plant is easily propagated by offsets, which the plants put out in plenty. If these are planted in mud or strong earth placed on a building or old wall, they will thrive without farther care.

The second sort grows naturally in the northern parts of Europe. The leaves of this sort are much narrower, and the heads are furnished with a greater number of leaves than those of the former, which grow more compact, and are closely set on their edges with hairs. The offsets of this are globular, their leaves turning inward at the top, and lie close over each other; these are thrown off from between the larger heads, and falling on the ground take root, whereby it propagates very fast. The flower-stalks of this are smaller than those of the former, and the flowers are of a paler colour.

The third sort grows naturally upon the Helvetian mountains. This greatly resembles the first, but the leaves are smaller, and have no indentures on their edges; the offsets of this sort spread out from the side of the older heads, and their

their leaves are more open and expanded. Out of the center of the heads comes forth the flower stalk, which rises nine or ten inches high, garnished below with some narrow leaves; the upper part is divided into three or four branches, which are closely furnished with deep red flowers, composed of twelve star-pointed pointals, set round the circle of germen, which is attended by twenty-four stamina, terminated by purple summits.

The fourth sort grows naturally upon the *Alps* and *Helvetician* mountains; this hath much shorter and narrower leaves than either of the former. The heads are small and very compact; the leaves are gray, sharp-pointed, and have slender white threads crossing from one to the other, intersecting each other in various manners, so as in some measure to represent a spider's web. The flower-stalks rise about six inches, are succulent, round, and garnished with awl-shaped succulent leaves, placed alternately; the upper part of the stalk divides into two or three branches, upon each of which is a single row of flowers ranged on one side above each other, composed of eight spear-shaped petals, of a bright red colour, with a deep red line running longitudinally in the middle; these spread open in form of a star, and in the center is situated the germen, of an herbaceous colour, surrounded by sixteen purple stamina, which are erect, terminated by yellow summits.

All the above mentioned sorts are extremely hardy, and propagate very fast by offsets; they love a dry soil, so are very proper to plant in rock-work, where they will thrive better than in the full ground, as they want no care; for when they are once fixed, they will propagate and spread fast enough, so that the larger sorts may require to be annually reduced to keep them within proper compass. When any of these heads flower, they die soon after, but the offsets soon supply their place.

The fifth sort grows naturally at the *Cape of Good Hope*, and also in *Portugal*; the old walls about *Lisbon* are covered with this plant. This rises with a fleshy smooth stalk eight or ten feet high, dividing into many branches, terminated by round heads or clusters of leaves lying over each other like the petals of a double Rose; they are succulent, of a bright green, and have very small indentures on their edges like the teeth of a very fine saw. The stalks are marked with the vestiges of the fallen leaves, and have a light brown bark; the flowers rise from the center of the heads, forming a large pyramidal spike; they are of a bright yellow colour, and the petals spread open like the points of a star; the other parts are like those of the other species. This sort generally flowers in autumn or winter, and the flowers continue long in beauty, during which time they make a fine appearance.

There is a variety of this with variegated leaves, which is much esteemed by the curious; this was accidentally obtained by a branch which had been accidentally broken from a plant of the plain kind at *Badmington*, the seat of his Grace the Duke of *Beaufort*, which, after having laid some time, was planted, and when the young leaves pushed out, they were variegated. These plants are easily propagated by cutting off the branches, which, when planted, soon put out roots; these should be laid in a dry place for a week before they are planted, that the bottom may be healed over, otherwise they are apt to rot, especially if they have much wet. When the cuttings are planted in pots, they should be placed in a shady situation, and must have but little wet, and, if they are plunged in a shady border, they will require no water, for the moisture of the ground will be sufficient for them. Some years past these plants were tenderly treated; their cuttings were put into a hot-bed, to forward their putting out roots, and in winter the plants were kept in stoves, but later experience has taught

us that they will thrive better with hardier treatment; for, if they are protected from frost and wet in winter, and have a good share of air in mild weather, they will thrive better, and flower oftener than when they are tenderly nursed. I have frequently seen the branches of these plants, which have been accidentally broken off and fallen on the ground, put out roots as they have laid, and have made good plants. The sort with striped leaves is tenderer than the other, and more impatient of wet in winter.

The sixth sort grows naturally in the *Canary Islands*; this seldom rises high, unless the plants are drawn up by tender management. The stalk is thick and rugged, chiefly occasioned by the vestiges of the decayed leaves; it seldom rises above a foot and a half high, supporting at the top one very large crown of leaves, disposed circularly like a full-blown double Rose. The leaves are large, ending in obtuse points, are a little incurved, succulent, soft to the touch, and pliable. The flower-stalk comes out of the center, and rises two or three feet high, branching out from the bottom, so as to form a regular pyramid of flowers, which are of an herbaceous colour, shaped like those of the other species; they are succeeded by horned capsules, filled with small seeds, which ripen late in autumn or winter, and then the plant dies.

This is propagated by seeds, which should be sown soon after it is ripe, in pots filled with light sandy earth, covering them over very lightly with the same. These pots should be placed under a common frame to keep out the frost, but should be exposed to the open air at all times in mild weather; here the pots may remain till the spring, when the danger of hard frosts is over, when they should be removed to a situation where they may have only the morning sun, and in dry weather the earth should be watered gently. This will soon bring up the plants, which must be kept clean from weeds, and, when they are fit to remove, they should be planted in pots, filled with light earth, and placed in the shade till they have taken new root; then they may be placed with other hardy succulent plants in a sheltered situation for the summer, and in winter placed in a frame where they may be protected from hard frost, but enjoy the free air in mild weather, with which they will thrive better than with tender treatment.

The seventh sort grows naturally at the *Cape of Good Hope*. This is a very low plant, whose heads spread close on the ground; they are much smaller than those of the common Houseleek. The leaves have white edges, which are indented like the teeth of a saw; the flowers are produced in loose panicles upon naked foot stalks; they are small and white, so make but little appearance.

This is propagated by offsets, which are put out in plenty from the sides of the heads; they must be planted in pots, sheltered from the frost in winter, and in summer placed in the open air with other hardy succulent plants.

SENECIO. *Tern. Inst. R. H. 456. tab. 260.* Groundsel.

The Characters are,

The flower is composed of many hermaphrodite florets, which form the disk, and female half florets, which make the border or rays, included in one common cylindrical empalement, which is rough, scaly, and contracted above. The hermaphrodite florets are tubulous, funnel-shaped, cut into five parts at the brim, which are reflexed; they have five small hair-like stamina; terminated by cylindrical summits, and an oval germen, crowned with down, situated under the petal, supporting a slender style, crowned by two oblong revolving stigmas. The germen afterward turns to an oval seed, crowned with down, inclosed in the empalement. The female half florets, which form the rays, are stretched out like a tongue, and are indented in three parts at the top.

We shall not trouble the reader with mentioning those species of this genus, which are esteemed common

weeds, so are not cultivated in gardens, but confine ourselves to those which are the most valuable.

1. *SENECIO corollis nudis, foliis amplexicaulibus lacris, caule herbaceo erecto. Hort. Upsal. 261.* Groundsel with naked petals, torn leaves embracing the stalk, and an erect herbaceous stalk.

2. *SENECIO corollis nudis, scapo subnudo longissimo. Flor. Leyd. Prod. 164.* Groundsel with naked florets, and a very long foot-stalk, which is almost naked; called *China Root*.

3. *SENECIO corollis radiantibus, foliis crenatis, infimis cordatis petiolatis, superioribus pinnatifidis lyratis. Flor. Virg. 98.* Groundsel with radiated flowers, and crenated leaves, the lower ones of which are heart-shaped, and have foot-stalks, but the upper lyre-shaped and wing-pointed.

4. *SENECIO corollis radiantibus, petiolis amplexicaulibus, pedunculis folio triplo longioribus, foliis pinnato-sinuatis. Flor. Leyd. Prod. 164.* Groundsel with radiated flowers, foot-stalks embracing the stalks, with foot-stalks to the flowers three times the length of the leaves, and winged sinuated leaves.

5. *SENECIO corollis radiantibus, foliis pinnatifidis æqualibus patentissimis, rachi infernè angustatâ. Hort. Cliff. 406.* Groundsel with radiated flowers, wing-pointed leaves, which are equal, and the midrib below narrowed.

6. *SENECIO corollis radiantibus, foliis pinnato-multifidis linearibus. Lin. Sp. Plant. 869.* Groundsel with radiated flowers, and wing-pointed, multifid, linear leaves.

7. *SENECIO corollis radiantibus, foliis ensiformibus acutè serratis subtus subvillosis, caule striatâ. Lin. Sp. Plant. 870.* Groundsel with radiated flowers, sword-shaped leaves, which are acutely sawed, a little hairy on their under side, and a close stalk.

8. *SENECIO corollis radiantibus, floribus corymbosis, foliis lanceolatis serratis glabriusculis. Hort. Upsal. 266.* Groundsel with radiated flowers growing in a corymbus, and spear-shaped, sawed, smooth leaves.

9. *SENECIO corollis radiantibus, floribus corymbosis, foliis lanceolatis serratis, semiamplexicaulibus.* Groundsel with radiated flowers growing in a corymbus, and spear-shaped sawed leaves half embracing the stalks.

10. *SENECIO corollis radiantibus, floribus corymbosis, foliis ensiformibus dentatis semiamplexicaulibus.* Groundsel with radiated flowers growing in a corymbus, and sword-shaped indented leaves, which half embrace the stalks.

11. *SENECIO corollis radiantibus, floribus corymbosis, foliis inferioribus oblongo-cordatis serratis, caulinis lanceolatis integerrimis amplexicaulibus.* Groundsel with radiated flowers growing in a corymbus, the lower leaves oblong, heart-shaped, sawed, and those on the stalks spear-shaped, entire, embracing the stalks.

12. *SENECIO corollis radiantibus, foliis utrinque tomentosis semipinnatis laciniis subdentatis, corymbo subrotundo. Haller. Helv. 731.* Groundsel with radiated flowers, half-winged leaves, which are downy on both sides, segments which are somewhat indented, and a roundish corymbus of flowers.

13. *SENECIO corollis radiantibus, foliis cordato-oblongis amplexicaulibus scabris acuminatis serratis, caule fruticoso. Hort. Cliff. 406.* Groundsel with radiated flowers, oblong, heart-shaped, rough-pointed, sawed leaves embracing the stalks, which are shrubby.

14. *SENECIO corollis radiantibus, foliis sagittatis amplexicaulibus dentatis, caule fruticoso. Vir. Cliff. 84.* Groundsel with radiated flowers, arrow-pointed indented leaves embracing the stalks, which are shrubby.

15. *SENECIO corollis radiantibus, foliis obovatis carnosissimis subdentatis, caule fruticoso. Lin. Sp. Plant. 871.* Groundsel with radiated flowers, oval fleshy leaves, which are somewhat indented, and a shrubby stalk.

15. *SENECIO corollis nudis, foliis linearibus hirsutis confertis, caule suffruticoso.* Groundsel with naked flowers, linear hairy leaves growing in clusters, and an under-shrub stalk.

The first sort grows naturally in *North America*; this is an annual plant. The stalk is round, channelled, and hairy; it rises three feet high, is garnished with torn leaves, which embrace the stalks with their base; the flowers are produced in a sort of umbel on the top of the stalks, composed of florets, having no rays; they are of a dirty white, and are succeeded by oblong seeds, crowned with a long down. This plant is preserved in some botanick gardens for the sake of variety, but has little beauty. The seeds of this must be sown upon a hot bed in the spring, and when the plants are come up fit to remove, they should be transplanted to another hot-bed to bring them forward, and afterward they may be planted in a warm border, where they will flower in *July*, and their seeds will ripen in autumn.

The second sort grows naturally at *Madras*; this has a perennial root, which has been supposed to be the *China Root*, but is now generally believed to be a spurious kind. The roots are composed of some thick fleshy tubers, sending out many fibres; the leaves are shaped like those of the Turnep, but are smooth. The flower stalk is slender, almost naked, and rises a foot and a half high, sustaining at the top a few yellow flowers, composed of several hermaphrodite florets, having no rays or borders; these are succeeded by oval seeds, crowned with down, but they rarely ripen in *England*.

This sort is tender, so will not thrive in this country, unless it is kept in a warm stove; it is propagated by parting of the roots in the spring. The offsets should be planted in pots, filled with light earth, and plunged into the tan-bed in the stove, and treated in the same way as other tender exoticks.

The third sort grows naturally in *North America*; this hath a perennial root, from which come out many roundish leaves upon long, slender, hairy foot-stalks, of a purplish colour on their under side, crenated on their edges. The stalks rise near two feet high, garnished with a few leaves, which are indented on each side in form of a lyre. The upper part of the stalk divides into several slender long foot-stalks, each sustaining one erect flower, composed of several hermaphrodite florets in the center, and a few female florets form the rays or border. They are yellow, and are succeeded by seeds, crowned with down. It is propagated by offsets, which come out in plenty from the root; these may be separated in autumn, and planted in an east border, allowing each plant two feet room to spread. When they have taken new root, they will require no other care, but to keep them clean from weeds.

The fourth sort grows naturally in *Africa*. This has an herbaceous perennial stalk, which rises about two feet and a half high, garnished at bottom with narrow leaves, which are situated on the sides so as to resemble winged leaves. The upper leaves are small, and embrace the stalks; they are very clammy, and stick to the fingers on being handled; the upper part of the stalk divides into several very long foot-stalks, each sustaining one yellow radiated flower. The plants continue in flower most part of the summer, and the seeds sometimes ripen in autumn.

This is propagated by cutting off the side shoots in any of the summer months, and planting them in a shady border, where in five or six weeks they will take root, and may then be taken up, and planted in pots, placing them in the shade till they have taken new root; then they may be removed to an open situation, and in autumn they must be placed under a frame, where they may be screened from hard frost, for they will not live abroad in winter here.

The fifth fort grows naturally at the *Cape of Good Hope*; it is an annual plant, which hath many herbaceous branching stalks that rise near three feet high, garnished with equal wing-pointed leaves. The flowers are produced in bunches on the top of the stalks; they are large and radiated, the border or rays being of a beautiful purple colour, and the middle or disk yellow. These plants flower from *July* till the frost stops them, and make a fine appearance. The seeds ripen in autumn, which, if permitted to scatter, there will be plenty of plants rise the spring following without care; they may be also sown upon a bed of earth in the spring, and when the plants are fit to remove, they may be transplanted about the borders of the flower-garden. If some of the plants are planted in pots, and housed in winter, they may be preserved till spring.

The sixth fort grows naturally on the *Alps* and *Pyrenees*; this has a perennial root and an annual stalk. The root is composed of a great number of long slender fibres; the stalks rise two feet high, and become a little lignous in autumn; they are garnished with very narrow wing-pointed leaves, resembling those of Hogs Fennel; the flowers are yellow, and are produced in bunches on the top of the stalks; they have rays or borders, resembling those of the other species. It is propagated by seeds, which should be sown upon a bed of loamy earth, where it is exposed only to the morning sun, where the plants will rise better than in a warmer situation. When the plants are fit to remove, they may be transplanted on a shady border, where they may remain till autumn, observing to keep them clear from weeds all the summer; then they should be transplanted to the places where they are to remain. The following summer the plants will flower and produce ripe seeds, and the roots will continue, if they are in a shady situation and a loamy soil.

The seventh fort grows naturally about *Paris*, by the sides of waters and in moist meadows. The root is perennial; the stalks rise three or four feet high, are close channelled, and garnished with sword-shaped leaves, which are hairy, and sharply sawed on their edges. The upper part of the stalk divides into several slender foot-stalks, sustaining yellow radiated flowers, which are succeeded by downy seeds in autumn, soon after which the stalks decay to the root.

The eighth fort grows naturally on the *Helvetian* mountains, and is sometimes found growing in low marshy places in the *Isle of Ely*. This hath a creeping root, by which it propagates and spreads where-ever it is once established. The stalks of this rise four feet high, garnished with smooth spear-shaped leaves, sawed on their edges, and placed alternate. The flowers are yellow, radiated, and are produced in a sort of corymbus on the top of the stalk, which are succeeded by seeds, having down.

The ninth fort grows naturally in *France*; this has some resemblance of the eighth, but the root does not creep like that. The leaves are shorter; the serratures on their edges are very small; they embrace the stalks with their base, and end in sharp points. The flowers are produced in larger and looser bunches on the top of the stalk, and are of a paler yellow colour than those of the former.

The tenth fort grows naturally in the *Levant*; this has a perennial root. The lower leaves are long, smooth, and somewhat shaped like a scymiter, the midrib being curved outward toward the point, and slightly indented on their edges. The stalk rises six feet high, garnished with leaves, growing smaller toward the top of the stalk. The flowers terminate the stalk in a compact corymbus; they are of a deep yellow, and have rays like those of the former forts.

These forts are easily propagated by seeds or parting of their roots; the latter is generally practised when the plant

is once obtained, as that is the most expeditious method, especially for the eighth fort, whose roots are apt to spread and increase too fast, where they are not confined. The best time to transplant and divide these roots is in autumn, when their stalks decay, that they may get good rooting before the spring. These plants are too large for small gardens, so are proper furniture for large borders in extensive gardens, or to plant on the sides of woods, where they may be allowed room, for they should have at least four feet allowed to each. When these are intermixed with other tall growing plants in such places, they will add to the variety.

The eleventh fort grows naturally in *North America*; this has a perennial root, from which come out smooth heart-shaped leaves, slightly indented on their edges, a little downy on their under side. The stalk rises three feet high, garnished with spear-shaped entire leaves embracing them; the flowers terminate the stalk in a close compact corymbus; they are of a deep yellow colour, and are succeeded by seeds, which ripen in autumn. This fort is propagated in the same manner as the former, and is equally hardy.

The twelfth fort grows naturally on the *Alps*; this is a perennial plant, of low growth. The stalks seldom rise a foot high; the whole plant is covered with a very white hoary down; the leaves are winged and indented; the flowers are collected into a close round corymbus on the top of the stalk, of a gold colour, and are radiated; they are rarely succeeded by good seeds in *England*. It is propagated by slipping off the heads in the autumn, and planting them in a bed of loamy earth in a shady situation, where they will put out roots, and may afterward be transplanted into an east border, where they may have the morning sun only, for this plant loves a gentle loamy soil, and a situation not too much exposed to the sun.

The thirteenth fort grows naturally at the *Cape of Good Hope*. This rises with a shrubby branching stalk six or seven feet high, closely garnished with rough leaves, whose base embrace the stalks; they are stiff, hairy, of a dark green colour, oblong, heart-shaped, and indented on their edges. The flowers are produced at the end of the branches, which are of a bright yellow colour, and are succeeded by seeds in autumn.

The fourteenth fort grows naturally at the *Cape of Good Hope*. This hath a very branching shrubby stalk, which rises four or five feet high, garnished with stiff leaves, whose base embraces the stalks; they are irregular in their figure, deeply cut on their edges, and of a gray colour on their under side. The flowers grow in loose bunches at the end of the branches, of a pale yellow colour. This fort flowers great part of summer, and the seeds ripen in autumn.

The fifteenth fort grows naturally at the *Cape of Good Hope*. This has a shrubby stalk, which rises seven or eight feet high, garnished with oblong oval leaves, indented on their edges. The flowers are produced in loose bunches at the extremity of the branches, almost in form of an umbel; they are of a pale yellow colour.

The sixteenth fort grows naturally at the *Cape of Good Hope*. This is a perennial plant, from whose roots arise several hairy herbaceous stalks four feet high, garnished with hairy linear leaves in clusters, which sit close to the branches; they are of a deep green on their upper side, and pale on their under. The flowers are produced at the end of the branches in close bunches, formed like umbels, of a gold colour, but have no rays or borders, only hermaphrodite florets, which are included in one common empalement.

The four forts last mentioned are too tender to live in the open air through the winter in *England*, but are so hardy as only to require protection from hard frost, so may be kept in

in pots, and placed either under a frame in winter, or in a common green-house with other hardy kinds of plants, which require a large share of air in mild weather. They are all easily propagated by seeds or cuttings, but the latter being the most expeditious method, is generally practised here. If the cuttings are planted in a shady border during any of the summer months, they will readily take root; then they should be taken up, and each planted in a separate pot, and placed in the shade till they have taken new root; then they may be removed to a more open situation, where they may remain till there is danger of sharp frost, when they should be removed into shelter, and treated in the same way as other hardy kinds of green-house plants.

SENNA. *Tern. Inst. R. H. 618. tab. 319.* Senna.

The Characters are,

The flower has an empalement of five leaves; it has five roundish concave petals, and ten declining stamina, terminated by oblong arched summits. The germen is roundish and compressed, supporting a short style, crowned by an obtuse stigma. The germen afterward becomes a plain, roundish, compressed pod, a little incurved, having two cells, divided by an intermediate partition, each containing one or two oblong pointed seeds.

The Species are,

1. SENNA *foliolis quadrijugatis lanceolatis acutis.* Senna with four pair of spear-shaped pointed lobes to the leaves.

2. SENNA *foliolis quinquejugatis cordatis obtusis.* Senna with five pair of lobes to the leaves, which are heart-shaped and obtuse.

The first sort grows naturally in *Egypt*; this is an annual plant, which rises with an upright branching stalk a foot high, garnished with winged leaves, composed of four pair of small spear shaped lobes, ending in acute points. The flowers terminate the stalks in loose bunches; they are yellow, composed of five roundish concave petals, with ten stamina in the center surrounding the style; after the flower is past, the germen turns to a roundish gibbous pod, having two cells, each containing one or two oblong seeds. The leaves of this sort are used in medicine, and are commonly known in the shops by the title of Senna; these are annually imported from *Alexandria*, which occasioned the title of *Alexandrina* being added to it. This plant is propagated by seeds, which should be sown early in the spring, upon a good hot-bed; and when the plants are come up, and are fit to remove, they should be each planted in a small pot, and plunged into a fresh hot-bed, shading them from the sun till they have taken new root, after which they must be treated in the same way as the most tender exoticks; for as this is an annual plant, unless they are brought forward in the spring, they will not flower in this country; therefore they must be constantly kept in the hot-bed all the summer, observing to admit plenty of air in warm weather; by which method I have frequently had these plants in flower, but it is very rare that they perfect their seeds in *England*.

The second sort grows naturally in *India*, from whence I have received the seeds; for although it is called *Italian*, yet the plant does not grow there naturally. This is also an annual plant, rising with a branching stalk a foot and a half high; the leaves are winged, each having five pair of heart-shaped lobes, which are inverted, the point joining the branches, and the obtuse part is upward; they are of a sea-green colour, and of a thick consistence. The flowers are produced at the end of the branches, shaped like those of the first sort, but are larger, and of a brighter yellow colour. If the plants are brought forward early in the spring, they will flower in *July*, and by so doing good seeds may be obtained here. This sort is propagated in the same way as the first, and the plants require the same treatment.

SENNA THE BLADDER. See *Colutea*.

SENNA THE SCORPION. See *Emerus*.

SENSIBLE PLANT. See *Mimosa*.

SERAPIAS. *Lin. Gen. Plant. 903.* Bastard Hellebore.

The Characters are,

It has a single stalk; the sheath of the flower is at a distance. The germen sustains the flower, which has no empalement, but has five oblong oval petals. The nectarium is the length of the petal, hollowed at the base, oval, and gibbous below, cut into three points. The flower has two short stamina sitting upon the point, terminated by erect summits, placed under the upper lip of the nectarium; and an oblong contorted germen, situated under the flower, the style growing to the upper lip of the nectarium, crowned by an obsolete stigma. The germen afterward becomes an oval, obtuse, three-cornered capsule, armed with three keels, opening with a valve under each, having one cell, filled with small seeds.

The Species are,

1. SERAPIAS *bulbis fibrosis, nectarii labio obtuso crenato petalis brevioribus.* *Act. Upsal. 1740.* Serapias with fibrous bulbs, and the lip of the nectarium obtuse, crenated, and shorter than the petal.

2. SERAPIAS *bulbis fibrosis, petalis nectario longioribus obtusis, foliis lanceolatis nervosis.* Serapias with fibrous bulbs, obtuse petals which are longer than the nectarium, and veined spear-shaped leaves.

3. SERAPIAS *bulbis fibrosis, petalis reflexis, nectarii labio obtuso, foliis ensiformibus nervosis.* Serapias with fibrous bulbs, reflexed petals, the lip of the nectarium obtuse, and sword-shaped veined leaves.

4. SERAPIAS *bulbis fibrosis, nectarii labio quinquesido clauso, foliis lanceolatis nervosis amplexicaulibus.* Serapias with fibrous bulbs, the lip of the nectarium cut into five parts, and spear-shaped veined leaves embracing the stalks.

There are some other species of this genus which grow naturally in *Great-Britain* and *Ireland*, but as I have not had the good fortune to meet with them, so I shall not trouble the reader with an imperfect account of them from books: there are also a greater number of them which grow naturally in the *West-Indies*, of which I have samples in my collection; but having never seen any growing plants of them, I shall not insert them here.

The first sort grows naturally in woods and shady places in many parts of *England*; the roots are composed of many thick fleshy fibres, from which arises a single jointed stalk a foot high, garnished at each joint with one veined leaf; those on the lower part of the stalk are oval, but those above are spear-shaped, ending in acute points, embracing the stalks at their base. The stalk is adorned with flowers toward the top, which have some resemblance to those of *Orchis*, composed of two whitish, and three herbaceous petals, which expand, and in the middle appears the nectarium, which has a resemblance of a disbowed body of a fly, of a purplish colour. Under the flower is situated a channelled oblong head, which after the flower is past, swells and becomes a seed-vessel, filled with very small seeds.

The second sort grows naturally in *Stoken-Church Woods* in *Oxfordshire*, and in several parts of *Westmoreland* and *Lancashire*. This has fleshy fibrous roots, not quite so thick as those of the former; the stalks rise more than a foot high, garnished with spear-shaped veined leaves, ending in acute points, of a lucid green, and sit close to the stalk. The flowers are white, disposed alternately on the upper part of the stalk; the three outer petals are large, and two smaller within; in the center is situated the gaping nectarium, which appears to have two wings.

The third sort grows naturally in marshy woods in many parts of *England*; this has a fleshy fibrous root, from which arise a single stalk a foot and a half high, garnished at bottom with sword-shaped veined leaves, embracing the stalk with

with their base, ending in acute points. The upper part of the stalk is garnished with faded purplish-coloured flowers, disposed in a loose spike; they have five petals, inclosing a large nectarium like the body of a fly, with a yellowish head, striped with purple and a white body; the lip which hangs down is white, and fringed on the edge.

The fourth sort was discovered first in *Hertfordshire*, but since it has been found growing in many other places. The root of this is composed of fleshy fibres; the stalks rise more than a foot high, garnished with spear-shaped veined leaves, which embrace the stalks with their base. The stalk is terminated by a loose spike of white flowers, composed of five petals, and a large five-pointed nectarium, which is shut; the germen is oblong and channelled: this afterward becomes a capsule of the same form, filled with small seeds.

These plants are rarely kept in gardens, being difficult to propagate; there are few who have attempted them. They may be taken up from the places where they naturally grow, when their leaves begin to decay, and planted in a shady moist place, where they will thrive and flower.

SERJANIA. See Paullinia.

SERPENTARIA. See Aristolochia.

SERPILLUM. See Thymus.

SERRATULA. Dillen. Nov. Gen. 8. Saw-wort.

The Characters are,

The flowers are composed of many hermaphrodite florets, contained in one common cylindrical empalement; the scales of which are spear-shaped, ending in acute points. The hermaphrodite florets are equal, funnel shaped, of one petal. The tube is inflexed, the brim is bellied, and cut into five points; they have each five short hair-like stamina, terminated by cylindrical summits; and an oval germen, supporting a slender style, crowned by two oblong reflexed stigmas. The germen afterward turns to a vertical, oval, single seed, crowned with down, which ripens in the empalement.

The Species are,

1. SERRATULA foliis pinnatifidis, pinnis terminali maxima. Hort. Cliff. 391. Saw-wort with wing-pointed leaves, whose end lobe is the largest; common Saw-wort.

2. SERRATULA foliis lanceolato-oblongis serratis subtus tomentosis. Saw-wort with oblong spear-shaped leaves, which are sawed, and downy on their under side.

3. SERRATULA foliis ovato-oblongis acuminatis serratis, floribus corymbosis, calycibus subrotundis. Flor. Virg. 92. Saw-wort with oblong, oval, acute-pointed, sawed leaves, and flowers in a corymbus, whose empalements are roundish.

4. SERRATULA foliis linearibus, calycibus squarrosis sessilibus acuminatis. Hort. Cliff. 392. Saw-wort with linear leaves and rough empalements, which sit close to the stalks, ending in acute points.

5. SERRATULA foliis lanceolatis integerrimis, calycibus squarrosis pedunculatis obtusis lateralibus. Lin. Sp. Plant. 818. Saw-wort with entire spear-shaped leaves, and rough empalements, having obtuse foot stalks proceeding from the side of the stalks.

6. SERRATULA foliis linearibus, floribus sessilibus lateralibus spicatis, caule simplici. Lin. Sp. Plant. 819. Saw-wort with linear leaves, flowers in spikes from the side of the stalks sitting close, and a single stalk.

7. SERRATULA foliis lanceolatis rigidis, acutè serratis, caule corymboso. Saw-wort with stiff spear-shaped leaves, sharply sawed, and stalks forming a corymbus.

8. SERRATULA foliis oblongo-lanceolatis, integerrimis subtus hirsutis. Saw-wort with oblong, spear-shaped, entire leaves, hairy on their under side.

9. SERRATULA foliis oblongo-ovatis obtusè-dentatis, caule ramoso patulo, calycibus subrotundis mollibus. Saw-wort with oblong oval leaves, bluntly indented, a branching spreading stalk, and soft roundish empalements.

10. SERRATULA calycibus subhirsutis ovatis. Lin. Sp. Plant. 816. Saw-wort with oval empalements, a little hairy.

The first sort grows naturally in moist woods and marshes in many parts of *England*, so is rarely admitted into gardens. There are two varieties of this, one with a white, and the other a purple flower. The root is perennial; the lower leaves are sometimes entire, and at others are cut almost to the midrib into many jags; they are smooth, of a deep green, and neatly sawed on their edges. The stalks rise two feet high, garnished with wing-pointed leaves, whose extreme lobe is much larger than the other; the upper part of the stalk divides into several foot-stalks, sustaining at the top oblong squamous heads or empalements, which include several hermaphrodite florets.

The second sort grows naturally in *North America*; this has a perennial root, sending out several channelled stalks seven or eight feet high, garnished with spear-shaped leaves, slightly sawed on their edges, which are downy on their under side, sitting close to the stalk; the upper part of the stalk divides into foot-stalks, which sustain purple flowers in scaly empalements.

The third sort is a native of *North America*; the root is perennial; the stalks rise six or seven feet high. The leaves are oblong, oval, stiff, sawed on their edges, and of a light green on both sides. The flowers grow in a loose corymbus at the top of the stalk; they are purple, and have roundish empalements.

The fourth sort grows naturally in *Carolina*. This has a tuberous root, sending out a single stalk three feet high, garnished with stiff linear leaves, which are entire, and rough to the touch, of a pale green on both sides. The upper part of the stalk is adorned with purple flowers, having oblong, rough, prickly empalements; these sit close to the side of the stalk alternately, and the stalk is terminated by one head, which is larger than the other.

The fifth sort grows naturally in most parts of *North America*; this has a large tuberous root, from which comes out one strong channelled stalk three or four feet high, closely garnished with narrow spear-shaped leaves, which are entire. The upper part of the stalk is adorned with loose spikes of purple flowers, which come out from the side upon pretty long blunt foot-stalks; they have large rough empalements, composed of wedge-shaped scales. The flowers on the top of the spike blow first, and are succeeded by the other downward, which is contrary to the usual order of the greatest number of plants, whose flowers are ranged in spikes.

The sixth sort is a native of *North America*; this has a tuberous root, from which comes forth a single stalk from two to three feet high, garnished with very narrow smooth leaves, sitting close to the stalk without any order. The upper part of the stalk is adorned with smaller purple flowers than those of the former, sitting very close to the stalk, forming a long loose spike.

The seventh sort is also a native of *North America*; this has a perennial fibrous root, from which arise several strong purple stalks upward of six feet high, garnished with stiff spear-shaped leaves, deeply sawed on their edges, of a pale green on their under side. The upper part of the stalk divides into small branches, forming a loose corymbus of purple flowers, which are irregular in height, some of the flowers standing upon shorter foot-stalks than the other; their empalements are round, and the scales terminate in bristly points.

The eighth sort grows naturally in *Carolina*; this has a fibrous perennial root; the stalk rises four feet high; the leaves are entire, hoary on their under side, sitting close to the stalk. The flowers grow in loose bunches at the end

of the branches; they have oval empalements, composed of a few scales, which terminate in bristles. The flowers are of a pale purple colour.

The ninth sort grows naturally in the northern parts of *China*. This is an annual plant, with an herbaceous stalk a foot and a half high, covered lightly with a white meal; the branches spread out almost horizontally, garnished with smooth, oblong, oval leaves, which have a few blunt indentures on their edges, of a light green colour. The flowers are produced in loose bunches at the extremity of the branches, having roundish soft empalements, whose scales end with hairy points, including hermaphrodite florets of a bluish purple colour.

The tenth sort grows naturally on the tops of mountains in *Wales* and the north of *England*, and is but seldom kept in gardens. The root is perennial, from which arise two or three stalks a foot and a half high, of a deep green colour, channelled, and garnished with deep green leaves. From the middle of the stalk upward, there are branches sent out from the side, which grow erect, and sustain at the top small bunches of purple flowers, which have oblong slender empalements a little hairy.

The eight sorts which are first mentioned, are hardy perennial plants, so will thrive in the open air in *England*. The first is rarely admitted into gardens, but the other are frequently preserved in the gardens of the curious. The fourth, fifth, and sixth sorts, have large knobbed roots, so are propagated only by seeds, which seldom ripen in *England*. These should be sown on an east-aspected border, for if they are exposed to the mid day sun, they seldom succeed well. The seeds will often grow the first summer, if they are sown early in the spring, but sometimes they will remain in the ground a year, before the plants appear; so that if they should not come up the first season, the ground should not be disturbed, but must be kept clean from weeds till the following spring, when, if the seeds were good, the plants will come up; when these appear, if they are too close, some of the plants should be carefully drawn out while they are young, and planted in another border of four inches asunder; in this place they may remain till autumn, when these, and also those in the seed-bed, should be carefully removed to the places where they are designed to remain; the following summer these plants will flower, and the roots will abide several years, if they are planted in a light loamy soil not over-wet.

The other perennial sorts may be propagated by parting of the roots; the best time for doing this is in autumn, when their stalks begin to decay; for when they are removed in the spring, if the season should prove dry, their roots will not be sufficiently established to flower well the same year. These plants should not be removed or parted oftener than every third year, if they are expected to grow strong; nor should they be parted into small heads, for those will make no figure the first year. As these plants grow tall, so they should be planted in the middle of large borders, or with other tall plants; they may be planted in spaces between shrubs, or on the borders of woods, where they will have a good effect, during their continuance in flower, as they require no other culture than to dig the ground between them every spring.

The tenth sort is a perennial plant, which may be propagated by its creeping roots, and may be planted in a shady border, where it will thrive, and annually produce flowers.

The ninth sort is an annual plant; the seeds of this should be sown upon a moderate hot-bed the beginning of *April*, and, when the plants come up, and are fit to remove, they should be transplanted to a fresh hot-bed to bring them forward; afterward they should be treated in the same way as other hardy annual plants.

SESAMUM. *Lin. Gen. Plant.* 700. Oily Grain.

The Characters are,

The flower has an erect permanent empalement, cut at the top into five very short equal parts. The flower has one ringent petal, with a roundish tube the length of the empalement; the chaps are swollen, bell-shaped; the brim is cut into five points, four of which are almost equal; the other is twice their length. It has four stamina rising from the tube, which are shorter than the petal, the two inner being shorter than the other, terminated by erect summits; and an oval hairy germen, supporting a slender style longer than the stamina, crowned by a spear-shaped stigma, divided in two parts. The germen afterward becomes an oblong almost four-cornered capsule, having four cells, filled with oval compressed seeds.

The Species are,

1. SESAMUM foliis ovato-oblongis integris. *Hort. Cliff.* 318. Sesamum with oblong, oval, entire leaves.
2. SESAMUM foliis inferioribus trifidis. *Prod. Leyd.* 292. Sesamum with trifid lower leaves.
3. SESAMUM foliis omnibus trifidis. Sesamum with all the leaves trifid.

The first sort is cultivated in great plenty in the *Levant*, but is supposed to have been brought there from *India*. It is an annual plant, rising with an herbaceous four-cornered stalk two feet high, sending out a few short side branches; the leaves are oblong, oval, a little hairy, and stand opposite. The flowers terminate the stalks in loose spikes; they are small, of a dirty white colour, shaped somewhat like those of the Foxglove. After the flowers are past, the germen turns to an oval acute-pointed capsule with four cells, filled with oval compressed seeds, which ripen in autumn.

The second sort grows naturally in *India*; this is also an annual plant; the stalk rises taller than that of the former; the lower leaves are cut into three parts, which is the only difference between them.

The third sort grows naturally in *Africa*. This is also an annual plant, with a taller and more branched stalk than either of the former, in which it differs from both the other.

The first sort is frequently cultivated in all the eastern countries, and also in *Africa*, as a pulse; and of late years the seeds have been introduced into *Carolina* by the *African* negroes, where they succeed extremely well. The inhabitants of that country make an oil from the seed, which will keep good many years, without having any rancid smell or taste, but in two years becomes quite mild; so that when the warm taste of the seed, which is in the oil when first drawn, is worn off, they use it as a salad oil, and for all the purposes of sweet oil.

The seeds of this plant are also used by the negroes for food, which seeds they parch over the fire, and then mix them with water, and stew other ingredients with them, which makes an hearty food. Sometimes a sort of pudding is made of these seeds, in the same manner as with Millet or Rice, and is by some persons esteemed, and is rarely used for these purposes in *Europe*. This is called Benny, or Bonny, in *Carolina*.

In *England* these plants are preserved in botanick gardens as curiosities. Their seeds must be sown in the spring upon a hot-bed, and when the plants are come up, they must be transplanted into a fresh hot-bed to bring them forward. After they have acquired a tolerable degree of strength, they should be planted into pots, and plunged into another hot-bed, managing them as hath been directed for *Amaranthuses*, to which I shall refer the reader, to avoid repetition; for if these plants are not thus brought forward in the former part of the summer, they will not produce good seeds in this country.

The seed of the first sort is mentioned in the list of *Officinal Simples* in the *College Dispensatory*, but is rarely used in medicine in *England*. From nine pounds of this seed which came from *Carolina*, there were upwards of two quarts of oil drawn, which is as great a quantity as hath been obtained from any vegetable whatever. This, I suppose, might occasion its being called *Oily Grain*.

SESELI. *Boerb. Ind. alt. 1. p. 50.* Wild Spignel.

The Characters are,

It has an umbellated flower; the particular umbels are very short, multiplex, and almost globular. The principal umbel has no involucre; the particular ones have a many narrow-leaved involucre, which is as long as the umbel; the principal umbel is uniform. The flowers have five inflexed heart-shaped petals, which are unequal; they have each five awl-shaped stamens, terminated by single summits. The germen is situated under the flower, supporting two reflexed styles, crowned by obtuse stigmas. The germen afterward turns to a small, oval, channelled fruit, dividing in two parts, each containing one oval streaked seed, flat on one side, and convex on the other.

The Species are,

1. SESELI *petiolis ramiferis membranaceis ventricosus emarginatis. Hort. Cliff. 103.* Seseli with bellied, membranaceous, branching foot-stalks, which are indented at the top.

2. SESELI *foliis bipinnatis sublinearibus, petiolis basi membranaceis, seminibus ovalibus. Lin. Sp. Plant. 360.* Seseli with double-winged leaves almost linear, with a membranaceous base to the foot-stalks, and oval seeds.

3. SESELI *petiolis ramiferis membranaceis oblongis integris, foliis singularibus binatisque. Guett. 64.* Seseli with branching, oblong, entire, membranaceous foot-stalks, the small leaves single and by pairs.

4. SESELI *petiolis ramiferis membranaceis oblongis integris, foliis caulinis angustissimis. Hort. Cliff. 102.* Seseli with oblong, entire, membranaceous, branching foot-stalks, and very narrow leaves on the stalks.

5. SESELI *caule alto rigido, foliis linearibus fasciculatis. Lin. Sp. Plant. 260.* Seseli with a tall stiff stalk, and very narrow leaves in clusters.

6. SESELI *petiolis membrana destitutis. Flor. Leyd. Prod. 112.* Seseli with foot-stalks without membranes.

The first sort grows naturally in *France* amongst the *Corn*; this rises with an erect stalk two feet high, garnished with short leaves, divided into small segments like *Hogs Fennel*. At the foot-stalk of each branch or leaf is a bellied membrane, which embraces it. The stalk is terminated by an umbel of white flowers, and the seeds ripen in *August*.

The second sort grows naturally in *Germany*; this hath a perennial root. The leaves are long, made up of eight or nine pair of winged lobes, which are cut like those of *Parsley*; the stalk rises two feet and a half high, branching out into several divisions; at each of these there is a membrane embracing the base, and one small leaf, composed of a few linear lobes. The stalks are terminated by compound umbels of yellow flowers, which are succeeded by seeds.

The third sort grows naturally in uncultivated places in the south of *France* and *Italy*; this has a perennial root, sending out slender smooth stalks two feet high. The leaves are long and narrow, composed of seven or eight pair of wings, whose lobes are sometimes single, and at others are divided into two parts; they have a membrane embracing their foot-stalks, and are of a gray colour. The stalks are terminated by umbels of flowers, which are purple on their outside, and white within.

The fourth sort grows naturally on the dry hills in many parts of *France* and *Italy*; this has a perennial root, from which come out leaves like those of *Spignel*, but the segments are broader and of a gray colour. The stalks rise a foot high, garnished with a few very narrow leaves, whose

foot-stalks are embraced by a long entire membrane, and are terminated by umbels of white flowers.

The fifth sort grows naturally in the south of *France*, in *Italy*, and *Spain*; this has a thick ligneous root, from which arise stiff stalks four feet high, crooked at their joints, and garnished with narrow leaves coming out in bunches. The stalks divide into slender branches, which have small umbels of flowers coming out of their sides, and are terminated by larger. The flowers are small and yellow.

The sixth sort is an annual plant, which grows naturally in *Portugal*. The leaves of this are like those of *Spignel*, but much smaller, and have a very acrid biting taste. The stalks rise four inches high, sustaining a small umbel of flowers.

These plants are preserved in the gardens of botanists for the sake of variety, but at present their virtues are unknown, and, as they have little beauty to recommend them, they are rarely admitted into other gardens.

They may be propagated by sowing their seeds in autumn, for when they are sown in the spring, they frequently lie in the ground a year before the plants will appear; whereas those which are sown in autumn, always rise the following spring. They should be sown in drills about eighteen inches asunder, in a bed of fresh earth, where they are designed to remain, and in the spring, when the plants come up, they should be thinned where they are too close, leaving them about six inches distance in the rows; after this the plants will require no farther care, but to keep them constantly clear from weeds; the second season they will produce flowers and seeds. The perennial roots, which are permitted to remain after they have seeded, should have the ground gently dug every spring between the rows to loosen the earth, but there should be care taken not to injure their roots with the spade.

SHERARDIA. *Dillen. Gen. Nov. 3.* Little Field-Madder.

The Characters are,

The flower has a small permanent empalement sitting upon the germen; it has one long tubulous petal, cut into four plain acute parts at the brim; it has four stamens, situated on the top of the tube, terminated by single summits, and an oblong twin germen below the flower, supporting a slender bifid style, crowned by two headed stigmas. The germen afterward becomes an oblong fruit, containing two oblong seeds, which are separated.

The Species are,

1. SHERARDIA *foliis omnibus verticillatis, floribus terminalibus. Lin. Sp. Plant. 102.* Sherardia with all the leaves placed in whorls, and flowers terminating the stalks.

2. SHERARDIA *foliis foralibus binis oppositis binis floribus. Lin. Sp. Plant. 103.* Sherardia with leaves among the flowers by pairs opposite, and two flowers at a place.

The first sort grows naturally amongst the *Corn* in many parts of *England*; it is an annual plant, with trailing stalks which spread on the ground, garnished with short acute-pointed leaves growing in whorls, some of which have four, others five and six, and some have eight leaves in each whorl. The flowers terminate the stalk; there are generally five or six flowers in each bunch; they are blue, have pretty long tubes, and are cut into four segments at the top, spreading open. Their seeds ripen in autumn.

The second sort is an annual plant, which grows naturally on walls and dry places in *Italy*. The stalks of this are short; the leaves grow by pairs; the flowers are yellow, and placed by pairs. The seeds of these plants scatter, and come up without care.

SHERARDIA. *Vaill. See Verbena.*

SICYOS. *Lin. Gen. Plant. 971.* Single-seeded Cucumber.

The Characters are,

It hath male and female flowers on the same plant; the male flowers have a bell-shaped empalement of one leaf, with five indentures. The petal is bell-shaped, growing on the empalement; they have each three stamina, which are united above, terminated by summits, joined in a head. The female flowers are like the male, and sit upon the germen; they have no stamina, but the germen supports a cylindrical style, crowned by a thick three-pointed stigma. The germen afterward becomes an oval fruit set with bristly hairs, having one cell, containing a single seed of the same shape.

The Species are,

1. *SICYOS foliis angulatis*. Hort. Cliff. 452. Sicyos with angular leaves.

2. *SICYOS foliis laciniatis*. Lin. Sp. Plant. 1013. Sicyos with cut leaves.

3. *SICYOS foliis ternatis incis.* Flor. Leyd. Prod. 265. Sicyos with trifoliate cut leaves.

The first sort grows naturally in North America; this is an annual plant, which rises with two large seed-leaves like those of the Cucumber. The stalk is trailing, and has tendrils, by which it fastens itself to the neighbouring plants, where, if it has support, will rise fifteen or sixteen feet high, dividing into many branches, garnished with angular leaves like those of the Cucumber. The flowers come out upon long foot-stalks from the side of the branches, standing in clusters, some of which are male or barren flowers, others are female fruitful flowers; they are of a pale sulphur colour; the female flowers are succeeded by prickly oval fruit, containing one seed. If the seeds are permitted to scatter, the plants will come up in the spring better than when sown by hand, and require no other care, but to keep them clean from weeds. These plants ramble, and take up too much room for small gardens, therefore should be allowed a place near a hedge, upon which they may climb; they do not bear transplanting well, unless when they first come up.

The second sort grows naturally in the West-Indies; this is also an annual plant, with trailing stalks like the former, but the leaves of this are cut into several segments. The flowers are larger, and of a deeper colour; the fruit are not quite so large, nor so closely armed with prickly hairs, in which consists their difference.

This sort is not so hardy as the first, therefore whoever has a mind to cultivate it, must sow the seeds upon a hot-bed in the spring, and treat the plants in the same way as Cucumbers and Melons, keeping them under frames, otherwise the seeds will not ripen here; the plants will require more room than either of the former, so that one or two plants will be enough for curiosity, as they have no great beauty or use.

The third sort grows naturally in Jamaica; this is a perennial plant, with thick, jointed, fleshy stalks, which by age become ligneous; they send out branches, which have tendrils or clasps, by which they fasten themselves to any neighbouring support, and rise seven or eight feet high, garnished with trifoliate leaves, standing upon pretty long foot-stalks, which are thick, succulent, of a gray colour, cut on their edges, having a sharp acid taste. The flowers come out in clusters from the side of the branches, like those of the Vine; they are small, and of an herbaceous colour. This plant has flowered in the Chelsea garden, but has not produced fruit in England.

It is propagated by seeds, which should be sown in small pots, and plunged into a hot-bed of tanners bark, where the pots should remain till the plants come up, for the seeds sometimes lie long in the ground. When the plants are fit to remove, they should be each planted into a small pot, and plunged into a new hot-bed, shading them from the sun till they have taken new root; after which they must

be treated in the same way as other tender plants from the same country, keeping them always in the tan-bed in the stove; in winter they should have but little water. This plant is preserved for the sake of variety in the gardens of the curious.

SIDA. Lin. Gen. Plant. 747. Indian Mallow.

The Characters are,

The empalement of the flower is single, permanent, angular, and five-pointed. The flower is of one petal, cut into five broad segments, which are joined at their base, and are indented at their points; it has many stamina, which are joined in a column at bottom, but spread open above, terminated by roundish summits, and an orbicular germen, supporting a short multifid style, crowned by headed stigmas. The germen afterward becomes a five-cornered capsule, having five cells, each containing an angular roundish seed.

The Species are,

1. *SIDA foliis ovato-lanceolatis serratis, floribus solitariis axillaribus, semine rostrato bidente*. Indian Mallow with oval, spear-shaped, sawed leaves, single flowers on the side of the stalk, and seeds with two horns.

2. *SIDA caule ramoso hirsuto, foliis lanceolatis serratis floribus confertis axillaribus, semine rostrato simplici*. Sida with a branching hairy stalk, spear-shaped sawed leaves, flowers in clusters from the wings of the stalk, and seeds with a single horn or tooth.

3. *SIDA caule erecto ramoso, foliis lineari-lanceolatis dentatis subtus villosis, pedunculis axillaribus unifloris*. Sida with an erect branching stalk, linear spear-shaped leaves, hairy on their under side, and foot-stalks with one flower at the wings of the stalks.

4. *SIDA foliis cordatis serratis, pedunculis unifloris axillaribus, semine rostrato bidente*. Sida with heart-shaped sawed leaves, foot-stalks with one flower from the wings of the stalk, and seeds with two horns.

5. *SIDA foliis ovato-lanceolatis inæqualiter serratis, floribus axillaribus sessilibus, semine tridente*. Sida with oval spear-shaped leaves, which are unequally sawed, flowers sitting close at the wings of the stalks, and seeds with three teeth.

6. *SIDA caule erecto hirsuto, foliis subcordatis sessilibus serratis subvillosis, floribus confertis axillaribus sessilibus*. Sida with a hairy stalk, leaves almost heart-shaped, sitting close to the stalk, which are a little woolly, and flowers in clusters sitting close at the wings of the stalk.

7. *SIDA foliis orbiculatis plicatis serratis*. Hort. Cliff. 346. Sida with orbicular plaited leaves, which are sawed.

8. *SIDA foliis cordatis subangulatis serratis villosis*. Lin. Sp. Plant. 684. Sida with heart-shaped leaves almost angular, which are woolly and sawed.

9. *SIDA foliis orbiculato-cordatis crenatis, caule petiolisque hirsutis, pedunculis longis axillaribus unifloris*. Sida with orbicular, heart-shaped, crenated leaves, the stalks and foot-stalks of the leaves hairy, and long foot-stalks from the wings of the stalk with one flower.

10. *SIDA capitulis pedunculatis triphyllis septemfloris*. Lin. Aët. Upsal. 1743. p. 137. Sida with heads on foot-stalks, which have three leaves and seven flowers.

11. *SIDA foliis lanceolatis serratis villosis, caule erecto piloso, pedunculis axillaribus unifloris*. Sida with spear-shaped, woolly, sawed leaves, an erect hairy stalk, and foot-stalks from the wings of the stalk with one flower.

12. *SIDA foliis cordatis crenatis acuminatis villosis, caule petiolisque pilosis, pedunculis axillaribus unifloris*. Sida with heart-shaped, pointed, crenated, woolly leaves, the stalks and foot-stalks hairy, and foot-stalks with one flower at the wings of the stalk.

13. *SIDA caulibus procumbentibus, foliis oblongo-ovatis serratis hirsutis, floribus sessilibus terminalibus*. Sida with trailing stalks, oblong, oval, hairy, sawed leaves, and flowers sitting close at the end of the branches.

14. SIDA

14. *SIDA foliis cordatis serratis acuminatis glabris, caule ramoso, pedunculis axillaribus unifloris.* Sida with heart-shaped, sawed, acute-pointed, smooth leaves, a branching stalk, and foot-stalks from the wings of the stalks with one flower.

15. *SIDA caulibus procumbentibus, foliis ovatis serratis tomentosis nitidis, floribus solitariis axillaribus sessilibus.* Sida with trailing stalks, neat, oval, sawed, woolly leaves, and single flowers sitting close to the wings of the stalk.

16. *SIDA foliis subcordatis crenatis subtus tomentosis, floribus aggregatis axillaribus sessilibus.* Sida with almost heart-shaped leaves, which are crenated, woolly on their under side, and flowers in clusters sitting close at the wings of the stalk.

17. *SIDA foliis subovatis serratis nervosis subtus tomentosis, caule piloso, pedunculis axillaribus multifloris.* Sida with veined sawed leaves almost oval, woolly on their under side, a hairy stalk, and foot-stalks with many flowers at the wings of the stalks.

18. *SIDA foliis lanceolatis inaequaliter serratis acuminatis, floribus capitatis terminalibus, caule fruticoso.* Sida with spear-shaped acute-pointed leaves unequally sawed, flowers collected in heads at the end of the branches, and a shrubby stalk.

19. *SIDA foliis cordatis acuminatis serratis nervosis, floribus aggregatis axillaribus sessilibus.* Sida with acute-pointed, heart-shaped, sawed, veined leaves, and flowers in clusters sitting close to the wings of the stalk.

20. *SIDA caule erecto suffruticoso, foliis cordatis crenatis tomentosis, pedunculis axillaribus unifloris.* Sida with an erect under-shrub stalk, heart-shaped, woolly, crenated leaves, and foot-stalks, with one flower from the wings of the stalk.

These plants grow naturally in the *West-Indies*, from whence I have received the seeds of three or four species by the title of Broom-weed; and I have been informed that the inhabitants cut these plants in the same manner as we do Heath, and make it up into brooms for sweeping. Sometimes I have received seeds of others by the title of *West-India Thea*, so that I suppose the leaves of some of these plants are sometimes used as the *Thea*. There are certainly more species of this genus than are here mentioned, which have escaped the notice of those who have been in the *West-Indies* in search of plants, for we frequently have new sorts come up in the earth, which is brought from thence with other plants. Those here enumerated are undoubtedly distinct species, for I have cultivated them several years, and have never observed either of them change, when raised from seeds.

The first sort grows as far north as *Virginia*, from whence I have several times received the seeds; this has an upright branching stalk three feet high, garnished with oval spear-shaped leaves, sawed on their edges, and sit close to the branches. The flowers come out singly from the wings of the stalks, standing upon very short foot-stalks; they are small, of a pale copper colour, of one petal, which is cut into five parts almost to the bottom, where they are joined. In the center arises a small column, composed of several stamens, and the style, which are connected together at bottom, but are separated above. The germen turns to a capsule with five cells, inclosed by the empalement; in each cell is contained one angular seed, gibbous on one side, having two horns or teeth at the point.

The second sort has hairy branching stalks three feet high. The branches of this come out from the bottom, and form a pyramidal bush; the leaves are longer and narrower; the saw on the edges deeper, of a brighter green than those of the former, and stand upon short foot-stalks.

The third sort rises with a slender ligneous stalk two feet high, sending out erect branches, garnished with narrow spear-shaped leaves, indented on their edges, ending in acute points, having pretty long slender foot-stalks. The

flowers come out singly from the wings of the stalks; they are small, of a pale yellow colour.

The fourth sort has very slender stalks, which seldom rise more than a foot high, sending out a few slender branches, garnished with small heart shaped leaves, sawed on their edges, a little hoary on their under side, standing upon pretty long foot-stalks. The flowers are small, of a pale yellowish colour, and come out singly from the wings of the stalk.

The fifth sort has a hairy stalk, covered with a dark brown bark three feet high, sending out many branches from the side, garnished with oval spear-shaped leaves, standing upon long foot-stalks, ending in an obtuse point, and are deeply sawed on their edges. The flowers come out by pairs at the foot-stalk of each leaf, sitting close to the stalk; they are larger than those of the former sorts, and of a deeper yellow colour; the seeds of this are larger, and have three teeth.

The sixth sort rises with a ligneous hairy stalk four feet high, sending out a few slender branches toward the top. The leaves are heart-shaped, a little woolly, and sit close to the stalk; they are veined, and sawed on their edges. The flowers come out in clusters on the side of the branches, to which they sit very close; they are small, of a pale yellow colour, and the seeds have two teeth.

The seventh sort has a slender ligneous stalk, which rises two feet high, sending out several slender branches, garnished with roundish leaves, having long foot-stalks, hairy on their under side. The flowers come out at the foot-stalks of the leaves, sometimes singly, and at others there are two or three; they are of a pale copper colour.

The eighth sort rises with an herbaceous stalk three feet high, sending out several erect branches, garnished with heart-shaped leaves, sawed on their edges, of a light green colour, soft to the touch, and stand upon very long hairy foot-stalks. The flowers stand upon long foot-stalks, which come out from the wings of the stalk; they are small, and of a sulphur colour.

The ninth sort has very slender stiff stalks, covered with fine hairs, sending out a few side branches, garnished with roundish heart-shaped leaves; they are of a light green colour, crenated on their edges, and stand upon long, slender, hairy foot-stalks. The flowers come out upon long foot-stalks from the wings of the stalks singly; they are small and white.

The tenth sort rises with an herbaceous prickly stalk near four feet high, sending out several branches, garnished with rough hairy leaves, standing upon long foot-stalks. These are of different forms, some are divided into five obtuse lobes, others into three, some are hollowed on the sides in shape of a fiddle; they are indented on their edges, and are of a pale green colour. The flowers are collected in heads, which stand upon very long hairy foot-stalks, arising from the wings of the stalks. Under each head are placed three obtuse small leaves, upon which rest seven small pale yellow flowers, which are almost hid by their empalements; these are succeeded by seeds, having acute spines.

The eleventh sort rises with a ligneous stalk three feet high, covered with yellowish hairs very closely garnished, with spear-shaped hairy leaves, sitting close to the stalks, sawed on their edges, of a pale green on their under side. The flowers come out singly from the wings of the stalk, standing upon short foot-stalks; they are small and white.

The twelfth sort rises with very slender infirm stalks three feet high, covered with long white hairs, garnished with soft, woolly, heart-shaped leaves, sitting upon long, slender, hairy foot-stalks, crenated on their edges. The flowers stand upon long slender foot-stalks, which arise from the

wings of the stalk, two of them generally coming out at each leaf; they are of a pale yellow colour.

The thirteenth sort has many trailing stalks, which divide into slender branches, covered with a light brown bark, garnished with small, oblong, oval leaves, sawed on their edges, hairy on their under side, standing upon short foot-stalks. The flowers are produced in small clusters, sitting close at the end of the branches; they are of a bright scarlet colour, and are succeeded by seeds, having two stiff bristly teeth.

The fourteenth sort hath smooth round stalks, which rise three feet high, sending out long slender branches. The leaves are smooth, heart-shaped, of a light green colour, and stand upon long foot-stalks, sawed on their edges, ending in acute points. The flowers stand upon very long foot-stalks, arising from the wings of the stalks singly; they are small, and of a whitish yellow colour.

The fifteenth sort sends out several stalks from the root, which spread flat on the ground, garnished with oval fatty leaves, sawed on their edges, having short foot-stalks; the flowers come out singly at the wings of the stalks, sitting very close thereto; they are small, of a yellow colour, and are succeeded by seeds which have no teeth.

The sixteenth sort has a ligneous stalk two feet high, with a purplish bark, sending out several branches from the lower part. The leaves are veined pretty thick, and almost heart-shaped, ending with obtuse points, crenated on their edges, and woolly on their under side, standing upon pretty long foot-stalks. The flowers are of a pale yellow colour, gathered in clusters, sitting close at the wings of the stalk; the seeds have two teeth at their points.

The seventeenth sort has a ligneous stalk four feet high, covered with brown hairs, sending out a few long slender branches, the lower parts of which are garnished with oval veined leaves, slightly sawed on their edges, and are downy on their under side. The upper part of the branches are destitute of leaves more than a foot in length; from the side come out foot-stalks two inches long, sustaining several small yellow flowers in clusters, having hairy empalements.

The eighteenth sort grows naturally at *La Vera Cruz* in *New-Spain*; this rises with a strong shrubby branching stalk six or seven feet high, covered with a rough brown bark, garnished with spear-shaped leaves, standing on pretty long foot-stalks, ending in acute points, and are unequally sawed on their edges. The upper surface of the leaves are of a dark green; their under is of a pale or light green colour. The flowers are collected in heads, standing upon long naked foot-stalks, which terminate the branches; each of these heads contain seven or eight flowers, whose petals extend much beyond their empalements. They are of a pale sulphur colour when they first open, but afterward fade to an almost white; the seed have three sharp teeth, which are burry, and stick to the clothes of those who rub against them when ripe.

The nineteenth sort grows naturally in *Jamaica*; this rises with a shrubby branching stalk seven or eight feet high, garnished at each joint by one large heart-shaped leaf, standing upon a pretty long foot-stalk, sawed on their edges, and run out to a long sharp point, of a light green on their upper surface, and pale on their under. The flowers grow in clusters at the wings of the stalks; those on the lower part of the branches are formed in close obtuse spikes; the branches are terminated by one of these spikes; the flowers are small, and when first open are white, but afterward they fade to a brownish colour.

The twentieth sort rises with ligneous stalks, covered with a soft woolly bark; garnished with heart-shaped woolly leaves, standing upon pretty long foot-stalks; they are veined, and crenated on their edges. The flowers stand

upon short foot-stalks, which arise from the wings of the stalk singly; their empalements are woolly and obtuse; the flowers are yellow, and are succeeded by seeds which have two teeth.

These plants are most of them annual in *England*, but some of them are of longer duration in their native countries, and might be so here, if they were placed in a warm stove in winter; but, as they perfect their seeds the same year, if the plants are brought forward in the spring, so few persons have room in their stoves to receive these plants, as there are so many perennial exotic plants at present in the *English* gardens, which require a warm stove to preserve them.

These plants are propagated by seeds, which should be sown upon a moderate hot-bed the beginning of *April*, and when the plants are fit to remove, they should be transplanted to another hot-bed four inches distance every way; they must be shaded from the sun till they have taken new root, and must have a large share of free air admitted to them, when the weather is mild, to prevent their drawing up weak. If the plants thrive well, they will have strength enough to be transplanted in the open air, for which purpose they should be gradually hardened, and taken up with balls of earth to their roots, and planted in a sheltered part of the garden, observing to shade and water them until they have taken new root; after which they will require no other care; but to keep them clean from weeds.

The eighteenth species will not flower the first year, so the plants must be placed in a warm stove in autumn, and during the winter they must be treated in the same way as other tender plants from the same country. The following summer they will flower and produce ripe seeds, but the plants are not of long duration, so that there should be a succession of young plants raised from seeds.

SIDERITIS. *Tourn. Inst. R. H.* 191. tab. 90. Ironwort.

The Characters are,

The flower has an oblong tubulous empalement, cut into five segments at the top. It is of the lip kind, of one petal, almost equal; the tube is cylindrical, the chaps oblong and taper. The upper lip is erect, and cut into two acute segments, the under lip is cut into three; the two side segments are acute, the middle is round and crenated. It has four stamina within the tube, two of which are as long as the tube, the other are shorter; and a four-pointed germen, supporting a slender style a little longer than the stamina, crowned by two stigmas; the upper is cylindrical, concave, and torn; the lower is short and membranaceous. The germen afterward turns to four seeds, which ripen in the empalement.

The Species are,

1. SIDERITIS *caulibus hirsutis procumbentibus, foliis oblongo-ovatis crenatis villosis, verticillis remotis.* Ironwort with hairy trailing stalks, oblong, oval, hairy, crenated leaves, and the whorls of flowers far asunder.

2. SIDERITIS *herbacea decumbens, calycibus spinosis, labio superiore indiviso.* *Lin. Sp. Plant.* 575. Declining herbaceous Ironwort with prickly empalements, and the upper lip of the flower undivided.

3. SIDERITIS *herbacea hispido-pilosa foliis superioribus amplexicaulibus.* *Lin. Sp. Plant.* 575. Herbaceous, hairy, stinging Ironwort, whose upper leaves embrace the stalk.

4. SIDERITIS *tomentosa, foliis linearilanceolatis sessilibus, calycibus spinosis.* Woolly Ironwort with narrow spear-shaped leaves sitting close to the stalks, and prickly empalements to the flowers.

5. SIDERITIS *foliis lanceolatis subdentatis, bracteis cordatis dentato-spinosis, calycibus æqualibus.* *Lin. Sp. Plant.* 575. Ironwort with spear-shaped leaves slightly indented, heart-shaped, prickly, indented bractæ, and the empalements of the flower equal.

6. *SIDERITIS fruticosa tomentoso-lanata, foliis cuneiformibus sessilibus, calycibus inermibus.* Shrubby, downy, woolly Ironwort, with wedge-shaped leaves sitting close to the stalks, and unarmed empalements.

7. *SIDERITIS fruticosa, foliis lanceolatis integerrimis, floribus spicatis terminalibus, calycibus spinosis.* Shrubby Ironwort with spear-shaped entire leaves, and spiked flowers terminating the stalks, having prickly empalements.

8. *SIDERITIS foliis lanceolatis glabris integerrimis, bracteis cordatis dentato-spinosis, calycibus aequalibus.* Lin. Sp. Plant. 575. Ironwort with smooth, entire, spear-shaped leaves, prickly, heart-shaped, indented bractæ, and equal empalements.

9. *SIDERITIS fruticosa tomentosa, foliis cordatis, pedunculis ante florescentiam nutantibus.* Lin. Sp. Plant. 574. Shrubby woolly Ironwort with heart-shaped leaves, and the foot-stalks nod before they flower.

The first sort grows naturally in *France, Spain, and Italy*; the root is perennial; the stalks are herbaceous, hairy, and trail upon the ground, sending out branches, garnished with oblong, oval, crenated, hairy leaves; the upper part of the stalk is furnished with whorls of purplish flowers, placed pretty far asunder. It is a plant of no great beauty or use, so is seldom kept in gardens.

The second sort is an annual plant with trailing stalks; the leaves are small, spear-shaped, and sit close to the stalks. The flowers grow in whorled spikes at the end of the branches; they are yellow. It grows in all the southern parts of *Europe*, and is seldom admitted into gardens.

The third sort grows naturally in the *Levant*. The roots of this sort seldom continue longer than two years in *England*; the lower leaves are oblong, entire, and hairy; the stalks are smooth, hoary, and rise near four feet high, sending out several long slender branches, garnished with hoary acute-pointed leaves, furnished with whitish flowers in whorls, which are placed far asunder; the empalements of the flowers are prickly, and the flowers are small.

The fourth sort grows naturally in *Crete*; this is a low shrubby plant, whose stalks rise a foot high, and are ligneous, sending out branches, garnished with narrow, spear-shaped, downy leaves; the upper part of the stalk is furnished with whorls of whitish yellow flowers, having prickly empalements.

The fifth sort grows naturally in the south of *France and Italy*; this hath a perennial root; the stalks rise a foot high, garnished with spear-shaped leaves, which are deeply crenated on their edges, and have short heart-shaped bractæ, which are prickly. The flowers grow in whorled spikes toward the end of the stalks; they are yellow, and have prickly empalements, which are equal.

The sixth sort grows naturally in *Crete*; this has a short ligneous stalk, from which is sent out a few branches, garnished with thick, wedge-shaped, downy leaves. The flowers are produced in whorls toward the end of the branches; they are yellow, and have smooth downy empalements.

The seventh sort grows naturally in *Spain and Italy*; this has a low shrubby stalk, sending out several hairy branches a foot long, garnished with hairy spear-shaped leaves. The flowers grow in close whorled spikes at the end of the branches; they are of a sulphur colour, and have very prickly empalements.

The eighth sort grows naturally on the mountains of *Valentia*; this has a short ligneous stalk, sending out branches a foot and a half long, garnished with narrow smooth leaves, of a strong scent when bruised. The flowers are yellow, and grow in large spiked whorls at the end of the branches.

The ninth sort grows naturally in the *Canary Islands*; it rises with a soft shrubby stalk five or six feet high, sending

out ligneous branches, covered with a soft down, garnished with heart-shaped leaves, having long foot-stalks. These differ greatly in size, according to the age and vigour of the plants; they are very woolly, especially on their under side, which is white, but their upper surface is of a dark yellowish green. The flowers grow in thick whorled spikes at the end of the branches; they are of a dirty white, shaped like those of the other sorts.

These plants are preserved in botanick gardens for the sake of variety. The five sorts first mentioned, and also the eighth, are hardy enough to thrive in the open air in *England*; they are propagated by seeds, which, if sown in autumn, will succeed better than those which are sown in spring. When the plants come up, they must be kept clean from weeds; and when the plants are fit to remove, part of each sort may be drawn out, and planted in a bed; this will give those which are left in the seed-bed room to grow. The plants which are removed should be shaded and watered until they have taken new root; after which they will require no other care, but to keep them clean from weeds. The fourth sort should have a dry soil and a warm situation, but neither of the sorts should be planted in rich ground, for that will cause them to grow so luxuriant in summer, that the frost or much wet will destroy them in winter.

The annual sort should not be removed, but the plants thinned and left in the place where they are sown, keeping them clean from weeds.

The sixth and seventh sorts will often live through the winter in the open air, especially if their seeds are sown upon dry rubbish; for when either of these happen to grow in the joints of old walls, they will endure the greatest cold of this country, therefore their seeds should be sown in such places. The sixth sort does not produce good seeds in *England*, so this is propagated by slipping off the heads, planting them in a shady border during the spring or summer months, which will readily take root; some of these may then be taken up and put into pots, that they may be screened under a frame in winter. The other may be removed in autumn, and planted close to warm walls in rubbish, where they will abide some years.

The ninth sort is generally kept in green-houses in *England*, but in moderate winters I have had the plants live abroad without cover in a warm dry border: however, if they are screened from hard frost under a common frame, where they may be exposed to the open air at all times when the weather is mild, and protected from hard frosts, they will thrive better than with more tender treatment. It is propagated by seeds, which should be sown in autumn, for those which are sown in the spring seldom succeed, or if they do, the plants rarely come up the first year.

SIDEROXYLUM, Iron-wood.

The Characters are,

The empalement of the flower is permanent, and is cut into five segments. The flower is bell-shaped, divided into five parts at the brim. It has five awl-shaped stamina the length of the petal, terminated by single summits, and a round germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes a roundish berry, having one cell, containing four seeds.

The Species are,

1. *SIDEROXYLUM inerme.* Lin. Hort. Cliff. 69. Smooth Iron-wood.

2. *SIDEROXYLUM foliis lanceolatis ex adverso sitis.* Iron-wood with spear-shaped leaves growing opposite.

These plants grow naturally at the *Cape of Good Hope*.

The first sort hath large oval leaves, shaped somewhat like those of the Bay-tree, but smoother and blunter at the end. These are placed on the branches without order, as the branches also are produced. The stalks are shrubby, and

and rise five or six feet high, sending out many branches, covered with a dark brown bark.

The second sort grows more upright and regular; the leaves, which are smaller, and more pointed than those of the first, are placed opposite on the branches, and these continue green through the year.

The wood of these trees being very close and solid, has given occasion for this name being applied to them, it being so heavy as to sink in water; and the title of Iron-wood having been applied to the wood, by the inhabitants of the countries where it grows, has occasioned the botanists to constitute a genus by this name. But as the characters of the plants have not been so well examined as could be wished, occasioned by their seldom flowering in Europe, it is very probable, that the plants which have been ranged under this genus, do not properly belong to it; for Dr. Plukenet has figured a plant under the title of *Ebenus Jamaicensis*, whose characters are very different from those assigned to this genus: and the *Jamaica Iron-wood* is totally different from both in its characters, for this has male and female flowers on different trees; the male flowers have no petals, as appears by dried samples in my collection.

These plants are natives of warm countries, so cannot be preserved in England, unless they are placed in a warm stove. They are propagated by seeds, when these can be procured from abroad. These must be sown in pots, and plunged into a good hot-bed in the spring, in order to get the plants forward early in the season. When the plants are fit to transplant, they should be each put into a separate small pot, and plunged into a fresh hot-bed. In the winter they must be plunged into the tan-bed in the stove, and treated in the same manner as hath been directed for several tender plants from the same countries. As the plants obtain strength, they may be treated more hardily, by placing them in a dry airy glass-case in the winter, giving them free air in mild weather, but in summer they should be placed abroad in a sheltered situation.

I have propagated them by layers, but these were two years before they had made good roots; and sometimes they will take from cuttings, but this is a very uncertain method of propagating them; nor do the plants so raised, ever grow so vigorously as those which come from seeds; so that when those can be procured, it is the best method.

SIGESBECKIA. *Lin. Sp. Plant.* 873.

The Characters are,

The proper involucre of the flower is composed of five linear, taper, obtuse leaves, which open beyond the petal, and is permanent. The common cover is five-leaved, fitting close; the leaves are oval, concave, equal, and disposed in several series; and between each leaf is contained a floret. The flower is composed of hermaphrodite florets in the disk, and the border or ray is made up of female half florets, which are tongue-shaped. The hermaphrodite florets are funnel-shaped, cut in five parts at the brim; these have five short stamina, with tubulous summits joined together, and an oblong incurved germen as large as the empalement, supporting a slender style, crowned by a bifid stigma. The germen afterward turns to an oblong, four-cornered, blunt seed; the female half florets have a short, broad, tongue-shaped petal, indented in three parts; these have a germen, style, and stigma, like the hermaphrodite florets, but have no stamina, and are succeeded by single seeds like the other.

We have but one Species of this genus, viz.

SIGESBECKIA. *Lin. Hort. Cliff.* Sigesbeckia.

This plant is annual, perishing at the approach of winter. The seeds of it were brought from the *Eaji-Indies*, where it is a troublesome weed; in England it is raised on a hot-bed, and brought forward in the spring; then the plants may be planted out in warm borders, and if they are kept dry with water in dry weather, they will grow four or

five feet high, and send out many branches. The flowers are produced at the extremity of the shoots, which are small, and of a yellow colour, so make no great appearance; therefore it is only preserved in the gardens of those persons, who are curious in the study of plants.

SILAUM. See *Peucedanum*.

SILENE. *Lin. Gen. Plant.* 503. Viscous Campion, or Lychnis.

The Characters are,

The flower has a permanent empalement, which is indented at the top in five parts. It has five plain obtuse petals, indented at their points, and a nectarium, compounded of two small indentures in the neck of each petal, constituting a crown to the chaps; and ten awl shaped stamina, inserted alternately to the tail of the petals above each other, terminated by oblong summits. In the center is situated a cylindrical germen, supporting three styles, which are longer than the stamina, crowned by stigmas that are reflexed against the sun. The germen afterward becomes a close cylindrical capsule with three cells, opening at the top five ways, inclosing many kidney-shaped seeds.

The Species are,

1. SILENE *petalis integerrimis subrotundis, fructibus erectis alternis. Hort. Cliff.* 171. Silene with entire roundish petals to the flower, and erect fruit alternate; commonly called Dwarf Lychnis.

2. SILENE *floribus spicatis alternis secundis sessilibus, petalis bifidis. Lin. Sp. Plant.* 416. Silene with fertile spikes of flowers sitting close, and the petals bifid.

3. SILENE *petalis bifidis, floribus lateralibus secundis cernuis, caule recurvato. Lin. Sp. Plant.* 417. Silene with bifid petals, nodding flowers growing from the side of the stalks, and a recurved stalk.

4. SILENE *petalis bifidis, caule fruticoso, foliis lato lanceolatis, panicula trichotoma. Lin. Sp. Plant.* 417. Silene with bifid petals, a shrubby stalk, broad spear-shaped leaves, and panicles divided three ways.

5. SILENE *foliis radicalibus cochleariformibus obtusissimis, caule subverticillato. Lin. Sp. Plant.* 418. Silene with the bluntest, spoon-shaped, lower leaves, and those upon the stalks almost in whorls.

6. SILENE *calycibus fructus globosis acuminatis striis triginta, foliis glabris. Hort. Upsal.* 110. Silene with globular acute-pointed capsules to the fruit, and smooth leaves.

7. SILENE *calycibus fructus pendulis inflatis, angulis decem scabris. Hort. Upsal.* 109. Silene with pendulous swollen empalements to the fruit, with ten rough angles.

8. SILENE *calycibus decem angularibus, dentibus tubum æquantibus. Lin. Sp. Plant.* 419. Silene with empalements having ten angles, and the indentures as long as the tube.

9. SILENE *calycibus fructus pyramidatis striatis, caulibus hirsutis, foliis acuminatis glabris.* Silene with pyramidal striped empalements to the fruit, a hairy stalk, and smooth acute-pointed leaves.

10. SILENE *calycibus conicis striis hirsutis, fructibus erectioribus, caule erecto hirsuto, foliis nervosis.* Silene with conical empalements, having hairy stripes, erect fruit, a hairy upright stalk, and veined leaves.

11. SILENE *petalis bifidis, caule dichotomo, floribus axillaribus sessilibus, foliis glabris. Lin. Sp. Plant.* 420. Silene with bifid petals, a stalk divided by pairs, flowers sitting close to the wings of the stalk, and smooth leaves.

12. SILENE *floribus fasciculatis fastigiatis, foliis superioribus cordatis glabris. Hort. Upsal.* 110. Silene with flowers gathered into bunches, whose upper leaves are smooth and heart-shaped; commonly called *Lobel's Catchfly*.

13. SILENE *foliis radicalibus obtusis, caulibus lanceolatis oppositis, floribus axillaribus erectis, pedunculis subtrifloris.* Silene with obtuse lower leaves, those upon the stalks spear-shaped and opposite, erect flowers at the wings of the

the stalks, and foot-stalks for the most part with three flowers.

14. *SILENE caule folioso herbaceo, foliis lanceolatis acutis glabris, calycibus erectis.* Hort. Cliff. 171. Silene with an herbaceous leafy stalk, spear-shaped, acute-pointed, smooth leaves, and erect empalements.

There are several other species of this genus, whose flowers have no beauty, so are seldom cultivated but in botanick gardens for the sake of variety, therefore I have not enumerated them, which would swell the work too much.

The first sort grows naturally in *Portugal*; in *England* it is well known by the title of Dwarf Lychnis. The seeds of this were formerly sown in drills on the edges of borders, as were several other low annual plants, for edgings of borders; but as they are of short duration, so they soon were rejected for this purpose; after which the seeds were usually sown in patches in the borders, where they made a better appearance than in the former way; but in both these methods the plants were generally left so close as to spoil their growth, for as their stalks were drawn up weak, and had not room to branch out, so their flowers were small, and made little appearance; but to have this plant in beauty, the seeds should be sown thin in autumn, and in the spring the plants should be thinned to the distance of four inches, and afterward kept clean from weeds. When they are so managed, the plants will rise a foot high, with hairy channelled stalks, and divide into many branches, garnished with oval, spear-shaped, hairy leaves, placed opposite. The flowers grow in short spikes at the end of the branches; they are placed alternately, and are of a bright purple colour, edged with white.

The second sort grows naturally in *Sicily*, and also at the *Cape of Good Hope*. This is an annual plant, with a low branching stalk, which seldom rises more than eight or nine inches high; the stalks are smooth; the leaves are very narrow and smooth, placed by pairs; the stalks are terminated by spikes of dark purple flowers standing alternate, whose petals are bifid; they open in the evening, but are closely shut in the day. If the seeds of this plant are sown in autumn upon a warm border, the plants will live through the winter, so good seeds may be obtained; but when the seeds are sown in the spring, they often fail.

The third sort is a perennial plant, which grows naturally on the *Alps*; the lower leaves of this are smooth and spear-shaped; the stalk rises near two feet high, garnished with two narrow leaves, placed opposite at each joint, and immediately below them; the stalk is very clammy. The flowers come out on short foot-stalks from the wings of the leaves, each foot-stalk for the most part sustaining three flowers, with long, white, bifid petals. This plant rises easily from seeds if they are sown in autumn, and the only culture the plants require, is to keep them clean from weeds, and allow them room to spread.

The fourth sort grows naturally in *Sicily*; this has a low shrubby stalk, which divides into several short shrubby branches, garnished with broad, smooth, spear-shaped leaves, ending in acute points. The flower-stalks rise about a foot high, and divide into spreading panicles by twos and threes. The flowers are of an herbaceous white colour, and are succeeded by oval smooth capsules, having thick covers, filled with small seeds, which ripen in autumn. This sort rises easily from seeds as the former; if the plants are planted in a warm border of dry earth, they will live several years, and require no shelter, but in moist ground they frequently rot in winter.

The fifth sort grows naturally in *Portugal*; this has a perennial root; the lower leaves are roundish, and hollowed like a spoon; those upon the stalks are obtuse, and stand sometimes by pairs, at others by threes or fours round the

stalks; they are of a deep green, smooth, and sit close to the stalks; the stalks are round, smooth, and rise from two to three feet high. The flowers grow in loose spikes at the top, and are of a green colour. This rises easily from seeds sown in autumn, or if the seeds are permitted to scatter, the plants will come up, and require no other culture but to keep them clean from weeds.

The sixth sort grows naturally among Corn in *France*, *Spain*, and *Italy*. It is an annual plant, with an upright branching stalk a foot and a half high, having swelling viscid joints, garnished with narrow, acute-pointed, smooth leaves, sitting close to the stalks. The flowers are small, of a red colour, and produced at the end of the branches; these are succeeded by globular capsules, ending in acute points, whose empalements are striped. The seeds of this should be sown in autumn, and in the spring the plants should be thinned and kept clean from weeds, which is all the culture they require.

The seventh sort grows naturally in *Sicily* and *Crete*; this is an annual plant, from whose root comes out several branching stalks a foot and a half long, which trail upon the ground, garnished with oval acute-pointed leaves, placed opposite. The flowers come out singly from the wings of the stalk upon short foot-stalks; they are large, of a bright red colour, resembling those of the common wild red Campion. These are succeeded by large capsules, included in inflated empalements, having ten rough angles, containing many large roundish seeds, whose weight causes the capsules to hang downward. If the seeds of this are permitted to scatter, the plants will come up without care, and require no more but to keep them clean from weeds.

The eighth sort is an annual plant, which is found naturally in *England* growing among Corn. It rises with a thick clammy stalk nine inches or a foot high, garnished with small oblong leaves by pairs, whose base embrace the stalks; the top of the stalk sustains one or two small red flowers, which open only in the night. The seeds ripen in *August*, which, if permitted to scatter, the plants will come up without farther trouble.

The ninth sort grows naturally in the *Archipelago*; this rises with a hairy stalk a foot and a half high, garnished with narrow spear-shaped leaves, placed by pairs, which are smooth, and sit close to the stalks. The flowers are disposed loosely at the top of the stalks; they are red, and have long pyramidal striped empalements. If the seeds of this sort are sown in autumn, and the plants afterward treated in the same way as the first, they will thrive and flower early in summer.

The tenth sort grows naturally in the *Levant*; this is an annual plant, with a strong, erect, hairy, branching stalk two feet high. The branches grow erect, as do also the flowers, which are red, and have large, conical, striped empalements, whose stripes are hairy, and of a brownish colour. This must be treated in the same way as the first sort.

The eleventh sort grows naturally in the south of *France*, *Spain*, and *Italy*; this is biennial. The stalk is round, clammy, and rises a foot and a half high, having swelling joints; the leaves grow round the stalks in clusters; they are narrow and smooth. The upper part of the stalk divides into spreading branches by pairs, adorned by red flowers, coming out singly from the wings of the leaves, sitting close to the stalks.

This sort is easily propagated by seeds, which, if sown in autumn, will succeed much better than in the spring. When the plants come up and are fit to remove, they should be transplanted at six inches distance, shading them from the sun, and watering them until they have taken new root; after which they must be kept clean from weeds till autumn, when they should be transplanted to the places where they are

are designed to remain for flowering. When the seeds of this plant happen to scatter upon a wall, and the plants arise there, they will continue much longer than in the ground.

The twelfth sort is an annual plant, which grows naturally in the south of *France* and *Italy*. The seeds of this have spread out upon walls and buildings so far, as to induce some to believe it a native of *England*.

There are three varieties of this, which generally retain their differences; one has a bright purple flower, the other a pale red, and the third a white flower; these do not differ in any other respect, so cannot be reckoned as different species.

These seeds should be sown in autumn, for those which are sown in the spring often fail; and if the plants do come up, they never grow so large, or make so good appearance, as the autumnal plants.

The thirteenth sort is biennial; this grows naturally in *Sicily* and *Crete*; the lower leaves of this plant are obtuse, and are gathered in circular heads like some of the *House-leeks*, or those of the *Auricula*; they are smooth, of a pretty thick consistence. The stalks rise five or six feet high, and are very viscous, garnished with spear-shaped leaves, placed opposite. The flowers come out upon short foot-stalks from the wings of the stalks, each foot-stalk sustaining three or four greenish flowers, which are succeeded by oval capsules, spreading open at the top, filled with angular seeds.

If the seeds of this plant are sown in autumn upon a warm border, they will more certainly succeed than those sown in the spring. When the plants come up and are fit to remove, they should be planted on a dry soil and in a warm situation, where they will live through the winter, and the following summer they will flower, ripen their seeds, and then decay.

The fourteenth sort grows naturally in the *Levant*; this has a perennial root; the lower leaves are narrow, spear-shaped, and smooth; they are gathered in clustered heads, from the middle of which arises an erect clammy stalk a foot and a half high, garnished with very narrow leaves. The flowers come out from the wings of the leaves toward the top of the stalk; their foot-stalks are short, each sustains two white flowers, having long tubes, standing erect; the flowers are closed in the day, and expand at night.

As the seeds seldom ripen here, so it is difficult to propagate it: the only way is to slip off the heads in *June*, and plant them under a glass; these will take root, if they are shaded from the sun and duly watered.

SILER. *Dod. Ligusticum. Tourn. Inst. R. H. 323.* Ser-mountain.

The Characters are,

It is a plant with an umbellated flower. The principal umbel is composed of many smaller. The involucre of the general umbel is composed of many short, broad, obtuse leaves, those of the particular umbels are composed of eight acute-pointed leaves; the principal umbel is uniform. The flowers have five petals, whose points are inflexed, heart-shaped, and equal. They have five slender stamina the length of the petal, terminated by single summits, and an oblong germen situated under the flower, supporting two styles, crowned by obtuse stigmas. The germen afterward becomes an oblong fruit with eight narrow membranaceous wings, and is divided into two parts, containing two oblong seeds, which are half cylindrical, plain on one side, but have two membranaceous borders on the other.

The Species are,

1. SILER *foliis duplicato pinnatis, foliolis ternis lanceolatis integerrimis sessilibus.* Siler with doubly-winged leaves, the lobes by threes, which are spear-shaped; entire, and sit close to the stalks.

2. SILER *foliis duplicato pinnatis, foliis ternis quiniseve, lanceolatis integerrimis, umbellis minoribus.* Siler with doubly-

winged leaves, whose lobes are placed by threes and fives; are spear-shaped, entire, and the umbels are smaller.

3. SILER *foliis duplicato pinnatis, foliolis quinis lineari-lanceolatis integerrimis, umbella maxima.* Siler with doubly-winged leaves, the lobes placed by fives, which are linear, spear-shaped, entire, and the largest umbel.

The first sort is used in medicine, by the direction of the College of Physicians. The seeds of this sort are the *Semen Seseleos* of the shops, which enters in compositions; and the green herb also is used, for which some of the people who supply the shops, often impose on their customers the *Mountain Oser*, which, by translating Siler an Oser, may afford them some pretence.

This sort grows naturally upon the mountains *Jura* and *Saleva* near *Geneva*, and in many parts of the *Alps*. The root is perennial, composed of many thick, rugged, fleshy fibres. The stalks rise four feet high, branching out upward into many foot-stalks, each being terminated by a large umbel of white flowers. The leaves stand upon very long foot-stalks, whose base embrace the stalks, and divide first into three smaller, and the middle foot-stalk divides again into three smaller, and these are again divided into small foot-stalks, which sustain three spear-shaped entire lobes; the middle one is the largest, of a gray colour, and sit close to the foot-stalks. The principal umbel of flowers is composed of thirty-four small umbels; the involucre of the great umbel is composed of ten short blunt leaves, which are alternately larger; the particular umbels have long foot-stalks, which spread out from one center in rays, and are nearly equal, so that the principal umbel is uniform. The flowers have five heart-shaped petals, which are a little inflexed; these are succeeded by oblong channelled fruit, having five narrow membranaceous borders, which divide into two seeds, which are plain on the sides which join, but are channelled on the other.

The second sort grows naturally in *Austria* and *Bohemia*; the root of this is like the former; the stalks are not so thick, but grow almost as tall; the foot-stalks of the leaves divide into three as the former, and the middle one is again divided into three smaller, which divide into small foot-stalks. The lobes are of a brighter gray than those of the other, and not so stiff. The umbels are composed of about twelve or fourteen small umbels, which are all of them much less than those of the former.

This sort never alters to the first; for I have many years raised both from seeds, and have not observed either to change.

The third sort grows naturally on the *Pyrenean* mountains; this has a strong perennial root like the two former; the stalks rise five or six feet high, and sustain very large umbels of flowers. The leaves are very large, being composed of many divisions of the foot-stalks, which are again divided into smaller; these sustain five narrower lobes than either of the former.

These plants are propagated by seeds, which should be sown in autumn soon after they are ripe, on a border of fresh undunged earth; in the spring, when the plants will appear, they should be kept constantly clear from weeds, and in very dry weather should be watered, which will greatly promote their growth. Where the plants come up too close together, they should be thinned, so as to leave them three or four inches apart, which will be sufficient room for them the first season; and at *Michaelmas* when their leaves decay, some of the plants may be carefully taken up, so as not to cut or break their roots, and transplanted into a moist shady border about three feet asunder, where they may remain for continuance. If these plants thrive well, they will produce seeds the second season, otherwise it will be the third summer before they flower and seed; after

after which the roots will abide many years, and greatly increase in their size, and will produce seeds every year.

The culture which these plants require, is only to keep them clear from weeds; and every spring, just before the plants put out their leaves, to dig the ground between them gently, so as not to injure their roots; and when their flower-stems are advanced, to place some sticks down by them, to which their stems should be fastened, to support them from being broken down by winds; for as their stems rise to the height of four or five feet, so when their umbels of seeds are formed, which are generally pretty large and heavy, they often occasion their stems falling to the ground, where they are not supported.

SILYQUA. See Ceratonia.

SILYQUASTRUM. See Cercis.

SILPHIUM. *Lin. Gen. Plant.* 882. Bastard Chrysanthemum.

The Characters are,

The common empalement of the flower is oval, imbricated, and permanent; the scales are oval, prominent, and reflexed in the middle. The disk of the flower is composed of hermaphrodite florets, which are tubulous, indented in five parts at the top. These have five short hair-like stamina, terminated by cylindrical summits, and a slender taper germen, supporting a long hairy style, crowned by a single stigma; these are barren. The rays of the flower are composed of a few female half florets, which are long, spear-shaped, and for the most part have three indentures at their points; these have a heart-shaped germen with a short single style, having two bristly stigmas of the same length, and are succeeded by single heart-shaped seeds with a membranaceous border, indented at the top, each point ending with a horn or tooth, and are separated by linear chaff, ripening in the empalement.

The Species are,

1. SILPHIUM *foliis binis, ternis quaternisque.* Silphium with leaves by pairs, threes and fours at a joint.

2. SILPHIUM *foliis indivisis sessilibus oppositis, inferioribus alternis.* *Lin. Sp. Plant.* 920. Silphium with undivided leaves set opposite close to the stalks, whose lower leaves are alternate.

3. SILPHIUM *foliis oppositis petiolatis serratis.* *Flor. Virg.* 181. Silphium with sawed leaves, having foot-stalks, which grow opposite.

4. SILPHIUM *foliis lanceolatis alternis scabris, obsolete serratis, caule fruticoso.* Silphium with rough spear-shaped leaves placed alternate, which have slight sawed edges, and a shrubby stalk.

The first sort grows naturally in many parts of North America; the root is perennial and ligneous; the stalks are annual; these rise six feet high or more in good land; they are of a purplish colour, and branch toward the top. The leaves are oblong, rough, and have some sharp teeth on their edges; toward the bottom of the stalk they stand by fours at each joint; higher up they are by threes, and at the top by pairs, sitting close to the stalks. The foot-stalks are pretty long, each sustaining one flower, whose empalement is composed of three orders of leaves placed imbricatum, like the scales of fish, the outer order being the smallest. The ray or border of the flower is composed of thirteen female half florets, which are yellow, tongue-shaped, and indented in three points at the end. The disk or middle of the flower is made up of hermaphrodite tubulous flowers, which are slightly cut into five parts at the top; these have five stamina and a style connected together, which are longer than the tube of the floret.

It is propagated by parting of the roots, in the same way as it is practised for the perennial Sunflowers; the best time for this is in autumn, when their stalks begin to decay, and the plants may afterward be treated in the same way as the perennial Sunflower.

The second sort grows naturally in Carolina; the root of this is perennial, the stalk is thick, solid, and set with prickly hairs; it rises near three feet high, has many purple spots; the leaves on the lower part of the stalk are placed alternate, but upward they are opposite, and sit close to the stalk; they are rough, having a few slight indentures on their edges. The upper part of the stalk divides into five or six small branches, which are terminated by yellow radiated flowers, like those of the perennial Sunflower, but smaller, having generally nine female half florets which compose the border or ray, the other parts are like those of the former sort. This sort is propagated by parting the roots in the same way as the former, but as this is not quite so hardy, it should be planted in a sheltered situation.

The third sort grows naturally in many parts of North America; this is a perennial plant, whose stalks rise near three feet high, garnished with oblong sawed leaves placed by pairs, upon short foot-stalks. The flowers are loosely disposed at the top of the stalks, they are yellow, and have their half florets which compose the ray, indented in three parts at the end. It may be propagated in the same way as the former, and the plants require the same treatment.

The fourth sort was discovered by the late Dr. William Houstoun, growing naturally at La Vera Cruz in New Spain. This rises with a shrubby stalk to the height of eight or ten feet, sending out ligneous branches, garnished with spear-shaped leaves placed alternately; their surface is rough, and their edges slightly sawed. The flowers are produced at the end of the branches, some of them singly on slender foot-stalks, others have two or three; they are unequal in height, and have short scaly empalements. They are of a deep yellow colour, but are not succeeded by seeds in England.

This sort is with difficulty propagated here, for unless the seeds are procured from the country where the plants grow naturally, they cannot be obtained that way, and the cuttings are not apt to take root. The only method of getting them to grow, is to slip off the young shoots in July, and plant them in a pot, and plunge it into a gentle hot-bed, covering the pot closely with a bell or hand-glass, and shade them from the sun. When the cuttings are rooted, they should be each planted in a separate pot, and during the warm months, they may be placed in the open air in a warm situation, but in winter they should be kept in a moderate stove.

SINAPIS. *Lin. Gen. Plant.* 735. Mustard.

The Characters are,

The empalement of the flower is composed of four narrow leaves placed in form of a cross, which fall off. The flower has four roundish petals in form of a cross, and four oval nectariums, one on each side of the stamina and the pointal. It has six awl-shaped erect stamina, two of which are opposite and as long as the empalement, the other four are longer. In the center is placed a taper germen, with a style the length of it, crowned by a headed stigma. The germen afterwards turns to an oblong pod, which is very rough at bottom, having two cells, opening with two valves, whose intermediate partition is large, compressed, and almost twice the length of the valves, the seeds are globular.

The Species are,

1. SINAPIS *filiquis hispida, rostro obliquo longissimo.* *Hort. Cliff.* 338. Mustard with prickly pods, and a very long oblique beak; commonly called White Mustard.

2. SINAPIS *filiquis glabris tetragonis.* *Hort. Cliff.* 338. Mustard with a smooth four-cornered pod; or common Mustard.

3. SINAPIS *filiquis multangulis toroso-turgidis, rostro longioribus.* *Hort. Cliff.* 338. Mustard with many angled rough swelling pods, having a longer beak.

4. SINAPIS *filiquis teretibus glabris obtusis.* Mustard with taper, obtuse, smooth pods.

5. *SINAPIS ramis fasciculatis, foliis summis lanceolatis integerrimis. Hort. Upsal. 191.* Mustard with bundled branches, and the upper leaves spear-shaped and entire.

6. *SINAPIS foliis duplicato-pinnatis, laciniis linearibus. Hort. Cliff. 338.* Mustard with double winged leaves, having linear segments.

The first sort is the common White Mustard, which is generally cultivated as a salad herb for winter and spring use. This rises with a branched hairy stalk two feet high, the leaves are deeply jagged on their edges and rough. The flowers are disposed in loose spikes at the end of the branches, standing upon horizontal foot-stalks; they have four yellow petals in form of a cross, which are succeeded by hairy pods that end with long, compressed, oblique beaks; the pods generally contain four white seeds.

The second sort is the common Mustard, which is frequently found growing naturally in many parts of *England*, but is also cultivated in fields for the seed, of which the sauce called Mustard is made. This rises with a branching stalk four or five feet high; the lower leaves are large, rough, and very like those of Turnep; the upper leaves are smaller, and less jagged. The flowers are small, yellow, and grow in spiked clusters at the end of the branches; they have four petals placed in form of a cross, these are succeeded by smooth four-cornered pods.

The third sort grows naturally on arable land, in many parts of *England*. The seed of this is commonly sold under the title of *Durham Mustard seed*; of this there are two varieties, if not distinct species; one with cut, the other has entire leaves. The stalks rise two feet high; the leaves are rough, and in one they are jagged like Turnep leaves, the other are long and entire. The flowers are yellow, the pods are turgid, angular, and have long beaks.

The fourth sort grows naturally in *Spain*; this seldom rises more than eight or nine inches high; the leaves are smooth and much jagged; the stalk branches toward the top, and is terminated by a loose spike of white flowers, which are succeeded by smooth, taper, blunt pods, filled with small brown seeds.

The fifth sort grows naturally in *China*. The plant is used as a boiled salad by the *Chinese*, where it may prove acceptable to those who have not better herbs for that purpose, but in *England* it is not regarded. The stalks of this rise three feet high, toward the bottom are garnished with broad, smooth, jagged leaves, but those at the top are entire. The flowers are yellow like those of the first sort, and the pods are smooth and turgid.

The first sort is chiefly cultivated in gardens, for a salad herb in the winter season. The seeds of this are commonly sown very thick in drills, either upon a warm border, or in very cold weather upon a moderate hot-bed, with Cresses and other small salad herbs, which are commonly fit for use in ten days or a fortnight from the time of sowing; for if they are large and have rough leaves, they are too strong to put into salads. In order to save the seeds of this plant, a spot of ground must be sown with it in the spring, and when the plants have four leaves, the ground should be hoed in the same manner as for Turneps, to cut down the weeds, and thin the plants where they are too close; this should be done in dry weather, for then the weeds will soon die after they are cut. If this is well performed, the ground will remain clean for a month, by which time young weeds will spring up again; therefore the ground should be again hoed over, and the plants now left about eight or nine inches asunder, which will be sufficient room for this sort to grow; if this is well performed in dry weather, the ground will remain clean till the seeds are ripe. As soon as the pods change brown, the plants should be cut off, and spread upon cloths two or three days to dry, and then threshed out for use.

The second sort is cultivated only for the seeds; these should be sown in the same way as those of the first, and the plants treated in the same manner, with this difference of allowing the plants twice as much room, because they grow much larger, so these should be hoed out to the distance of eighteen inches; and as the seeds will not ripen so soon as the other, so the ground may require to be hoed three times over, but that may be easily seen by the growth of the weeds.

The seeds of these two first species are ordered for medicinal use.

The third sort is a pretty common weed on arable lands, in most parts of *England*; this comes up early in the spring amongst the Corn, so flowers and seeds in *May*; therefore where it is not weeded out, the seeds will scatter long before the Corn is ripe, and the ground will be stocked with the weed.

The other three sorts are preserved in botanick gardens for variety, but are never cultivated for use; these may be treated in the same way as the two first species.

SINAPISTRUM. See Cleome.

SISARUM. See Sium.

SISON. *Lin. Gen. Plant. 311.* Bastard Stone Parsley.

The Characters are,

It has an umbellated flower; the general umbel is composed of six thin rays or small umbels, which are unequal, as are also the smaller, which have ten. The involucres of both are four-leaved and unequal; the empalement of the flower is scarce discernible. The outer petals of the general umbel are uniform; the flowers have five equal petals, which are spear-shaped and inflexed. They have five hair-like stamina the length of the petals, terminated by single summits. The oval germen is situated under the flower, supporting two reflexed styles, crowned by obtuse stigmas. The germen afterward becomes an oval streaked fruit, dividing in two parts, each containing one oval streaked seed, convex on one side, and plain on the other.

The Species are,

1. *SISON foliis pinnatis, umbellis erectis. Prod. Leyd. 105.* Sison with winged leaves and erect umbels.

2. *SISON foliis pinnatis, umbellis cernuis. Prod. Leyd. 105.* Sison with winged leaves and nodding umbels.

3. *SISON foliolis verticillatis capillaribus. Lin. Sp. Plant. 253.* Sison with hair-like small leaves in whorls.

The first sort grows on the side of ditches, and moist shady banks, in many parts of *England*; it is a biennial plant, which perishes soon after the seeds are ripe. The root is taper; the lower leaves are winged, composed of four pair of lobes, terminated by an odd one, regularly indented on both sides, and the indentures are sawed; they are of a lucid green, and have an aromattick odour. The stalks rise three feet high, and are garnished with leaves of the same form with those below, but smaller; at the end of the branches the white flowers are produced in small umbels, which are succeeded by striated seeds of a hot pleasant aromattick sinell and taste, which ripen in *August*.

This plant is found growing so plentifully wild, as that it is rarely kept in gardens; but whoever is willing to propagate it, should sow the seeds in autumn, in a moist shady spot of ground, where the plants will come up, and require no farther care than to keep them clean from weeds; and if the seeds are permitted to scatter, the plants will rise without care. The seed of this plant is put into *Venice Treacle*, for a succedaneum to the true Amomum.

The second sort grows naturally among Corn on moist land, in several parts of *England*. This is also a biennial plant, which decays soon after the seeds are ripe; it rises with an upright stalk about a foot high, which rarely divides into branches; the leaves stand upon pretty long foot-stalks; they are winged, but the lobes are smaller and finer cut

cut than those of the former; the umbels of flowers are more compact, and nod on one side. The plant may be cultivated in the same way as the first.

The third sort grows naturally on the *Alps* and *Apennines*; this rises with a swelling jointed stalk two feet high, garnished with very fine slender leaves, standing in whorls like those of the Water Milfoil; it branches out toward the top, each branch being terminated by a pretty large umbel of flowers, which are purplish on their outside, but white within; these are succeeded by seeds, which ripen the end of *July*. The roots of this plant are composed of thick fleshy knots, somewhat like those of the King's Spear.

The last mentioned sort may be cultivated by seeds, which should be sown in autumn, for those which are sown in the spring, seldom grow the first year. The plants require no other culture than to thin them where they are too close, and keep them clean from weeds.

SISYMBRIUM. *Tourn. Inst. R. H. 225. tab. 109.* Water Cresses.

The Characters are,

The flower has a spreading empalement, composed of four linear, spear-shaped, coloured leaves, which fall off; it has four oblong spreading petals, placed in form of a cross, and six stamina, four of which are longer than the empalement; the other two, which are opposite, are shorter, terminated by single summits; it has an oblong slender germen, with scarce any style, crowned by an obtuse stigma. The germen afterward becomes a taper, oblong, incurved pod, having two cells, opening with two valves, which are shorter than the intermediate partition, filled with small seeds.

The Species are,

1. **SISYMBRIUM** *filiquis declinatis, foliis pinnatis, foliolis subcordatis.* *Hort. Cliff. 336.* Sisybrium with declining pods, and winged leaves, whose lobes are almost heart-shaped; or Water Cress.

2. **SISYMBRIUM** *filiquis declinatis, foliis pinnatis, foliolis lanceolatis serratis.* *Hort. Cliff. 336.* Sisybrium with declining pods, and winged leaves having spear-shaped sawed lobes.

3. **SISYMBRIUM** *filiquis declinatis, oblongo-ovatis, foliis pinnatifidis serratis.* *Lin. Sp. Plant. 657.* Sisybrium with oblong, oval, declining pods, and wing-pointed sawed leaves.

4. **SISYMBRIUM** *foliis simplicibus dentatis serratis.* *Hort. Cliff. 336.* Sisybrium with single, indented, sawed leaves.

5. **SISYMBRIUM** *filiquis axillaribus sessilibus subulatis aggregatis, foliis repando-dentatis.* *Hort. Upsal. 193.* Sisybrium with awl-shaped pods in clusters sitting close to the stalks, and indented leaves which turn backward.

6. **SISYMBRIUM** *petalis calyce minoribus, foliis decomposito-pinnatis.* *Flor. Succ.* Sisybrium with petals smaller than the empalement, and decomposed winged leaves; called Flixweed.

7. **SISYMBRIUM** *foliis pinnato-hastatis flaccidis, foliolis sub-linearibus integerrimis, pedunculis laxis.* *Hort. Upsal. 193.* Sisybrium with spear, wing-pointed, flaccid leaves, having linear entire lobes with loose foot-stalks.

8. **SISYMBRIUM** *foliis pinnato-hastatis dentatis, filiquis erectis.* *Lin. Sp. Plant. 659.* Sisybrium with spear-shaped, winged, indented leaves, and erect pods.

9. **SISYMBRIUM** *foliis lanceolatis dentato-serratis caulinis.* *Hort. Cliff. 337.* Sisybrium with spear-shaped, winged, indented leaves on the stalks.

The first sort is the common Water Cress, which grows naturally in ditches and rills of water in most parts of *England*. The roots of this plant are composed of a great number of long fibres, which fasten themselves to the mud at the bottom of the ditches, from which arise several stalks, garnished with winged leaves, composed of five or six pair of roundish lobes, terminated by an odd one; these stand

almost alternate along the midrib. The stalks rise a foot and a half high; they are channelled, and divide at the top into two or three branches, which are terminated by loose spikes of small white flowers, composed of four petals, placed in form of a cross, and are succeeded by taper pods, filled with small brown seeds.

This plant has of late years been generally used as a salad herb in the spring of the year, and is by many preferred to all other sorts of salads for the agreeable warm bitter taste, and, being accounted an excellent remedy for the scurvy, and to cleanse the blood, as also a good diuretick, it has greatly obtained a preference to most other herbs for winter and spring use with many people. This is generally gathered in the ditches, and in other standing waters near *London*, to supply the markets; but whoever has a mind to cultivate it may easily do it, by taking some of the plants from the places of their natural growth, early in the spring, being careful to preserve their roots as entire as possible, and plant them into mud, and then let the water in upon them by degrees. When they have taken root, they will soon flourish, and spread over a large compass of water; they should not be cut the first season, but suffered to run to seed, which will fall into the water, and furnish a sufficient supply of plants afterward.

But where the water is so deep, that it will not be easy to plant them, the best method will be to get a quantity of the plants just as their seeds are ripening, and throw them on the surface of the water where they are designed to grow, and their seeds will ripen, and fall to the bottom, where they will take root, and produce a supply of these plants.

Some of those people who gather this herb for use, either through ignorance or some worse design, have frequently taken the creeping Water Parsnep, and sold it for Water Cress, whereby many persons have suffered who have eaten it, therefore those who make use of Water Cress, should be careful to have the right plant; they may be easily distinguished by the shape of their leaves, those of the Water Cress having roundish almost heart-shaped small leaves or lobes, with a few indentures on their edges, and are of a dark green colour; but those of the Water Parsnep have oblong lobes, ending in points, which are of a light green, sawed on their edges.

The second sort grows naturally on the borders of the river *Thames*, and in some other parts of *England*. The leaves of this sort are longer than those of the first; the lobes are much narrower, and are sawed on their edges; the flowers stand upon longer foot-stalks, and are much smaller. This spreads and multiplies in the same manner as the first.

The third and fourth sorts grow naturally on the banks of the *Thames*, and in ditches in many parts of *England*, so are not admitted into gardens.

The fifth sort grows naturally in the south of *France* and *Italy*; it is an annual plant, whose stalks spread and decline toward the ground; they grow a foot long, and divide into many branches, garnished with smooth leaves, shaped like the point of a halberd, deeply sinuated on their borders; the indentures turn backward. The flowers come out in clusters at the wings of the stalk; they are small, yellow, and are succeeded by slender crooked pods, standing in clusters. The seeds ripen in autumn.

The sixth sort grows naturally in uncultivated places, and also by the side of footways, in many parts of *England*. The leaves of this are divided into many very narrow segments; the stalks rise a foot and a half high, garnished with winged leaves, whose lobes are finely cut, resembling those of the true *Roman* Wormwood. The flowers are produced in loose spikes at the top of the stalk; they are

small, yellow, and composed of four petals, set in form of a cross, and are succeeded by slender pods, filled with small roundish seeds, which ripen in *August*, and then the plant dies. The seeds of this plant are used in medicine, and are by some greatly recommended for the gravel and stoppage of urine.

The seventh sort grows naturally in *France* and *Italy*. The lower leaves of this are flaccid, cut in form of winged leaves, ending in arrow-pointed lobes. The stalk rises three feet high, garnished with linear wing-pointed leaves; it branches out greatly; the flowers grow sparsely toward the end of the branches, which are succeeded by very long, slender, smooth pods, filled with small yellowish seeds. The seeds ripen in autumn, and the plant dies soon after.

The two last are preserved in botanick gardens for the sake of variety. If their seeds are permitted to scatter, the plants will come up in plenty, and require no other care but to thin them, and keep them clean from weeds; or if their seeds are sown in autumn, they will succeed better than in the spring.

The eighth sort grows naturally in many parts of *England*, so is seldom admitted into gardens; this is an annual plant, which sows itself, and comes up without care. It was remarked, after the great fire of *London*, that this plant came up in great plenty on the ruins.

The ninth sort grows naturally on the *Helvetian* mountains; this hath a perennial root, from which arise several branching stalks three feet high, garnished with spear-shaped leaves, sawed on their edges, of a deep green, standing alternately on the stalks. The flowers grow in loose spikes at the top of the stalks; they are small, yellow, composed of four petals, placed in form of a cross, and are succeeded by taper pods, filled with small seeds, which ripen in *August*.

This is preserved in some gardens for the sake of variety, but has no great beauty; it is propagated by seeds, which succeed best when sown in autumn, for those which are sown in the spring, seldom come up the same year. The plants require no care, but to thin them, and keep them clean from weeds; they love a cool shady situation.

SISYRINCHIUM. *Lin. Gen. Plant.* 908.

The Characters are,

The sheath, which incloses the flowers, faces both ways, and is composed of two compressed keel-shaped leaves. The flower has six oblong petals, and three very short stamina, terminated by bifid summits, which are fixed to the base of the style, with an oval germen situated under the flower, supporting an awl-shaped style, crowned by a trifid reflexed stigma. The germen afterward turns to an oval three-cornered capsule with three cells, filled with roundish seeds.

The Species are,

1. SISYRINCHIUM *foliis gladiolatis amplexicaulibus, pedunculis brevioribus.* Sisyrinchium with sword shaped leaves embracing the stalks, and shorter foot-stalks to the flower.

2. SISYRINCHIUM *foliis lineari-gladiolatis, pedunculis longioribus.* Sisyrinchium with linear sword-shaped leaves, and longer foot-stalks to the flower.

3. SISYRINCHIUM *foliis plicatis, spatha biflora.* Sisyrinchium with a plaited leaf, and two flowers in a sheath.

The first sort grows naturally in *Bermuda*, from whence it had the title of *Bermudiana* given it by *Tournefort*; this has a fibrous root, from which arise stiff, sword-shaped, entire leaves, of a dark green colour; between these come out the foot-stalks, which rises six inches high, compressed, with two borders or wings running the whole length, having three or four sword-shaped leaves, which embrace it; these grow erect, and are hollowed like the keel of a boat. The stalk is terminated by a cluster of six or seven flowers, standing upon short foot-stalks, inclosed by a two-leaved keel-shaped sheath before they open; the flowers are of a

deep blue colour with yellow bottoms, composed of six oval petals, ending in acute points. In the center is situated an upright style, at the bottom of which are three stamina, whose summits sit close to it; the stigma is cut into three parts, which are reflexed back to the style; these are of a gold colour. The germen, which was situated under the flower, turns to an oval obtuse capsule with three cells, filled with roundish seeds.

The second sort grows naturally in *Virginia*; this has a perennial fibrous root, from which arise many very narrow, spear-shaped, entire leaves, of a light green colour. The stalks rise about three inches high; they are very slender, compressed and bordered like those of the first, and have short, narrow, sword-shaped leaves, whose base embrace them; they are terminated by two small, pale, blue flowers, inclosed in a two-leaved sheath, standing upon longer foot-stalks than those of the other.

These plants are propagated by seeds, and also by parting of their roots; if they are raised from seeds, these should be sown in autumn, soon after they are ripe, upon an east-aspected border, where they may have only the morning sun. In the spring the plants will appear, when their leaves will have much resemblance to Grass, therefore care should be taken that they are not pulled up as weeds by those who clean the ground. During the first summer, they will require no other care but to keep them clean from weeds, unless the plants should come up so close as not to have room to grow; in which case, part of them should be drawn out to give room to the others; these may be planted in a shady border at three inches distance, where they may remain till autumn, when they should be transplanted to the places where they are to remain; the following summer they will flower. These plants love a shady situation and a soft, loamy, undunged soil.

The time for transplanting and flipping of the old roots, is early in autumn, that they may get good root before winter. They are both so hardy as to thrive in the open air in *England*, and are very rarely injured by cold.

The third sort grows naturally in the *West-Indies*; this has a small, oval, bulbous root, covered with a bright red skin, from which come out the leaves very like the first leaves of Palm-trees, but of a thinner substance; they have five or six longitudinal plaits, and are of a light green, ending with points; between these arise the foot-stalk of the flower four inches high, terminated by two or three small blue flowers, inclosed in a spatha or sheath, composed of six petals, which expand like those of the other sorts, but do not continue open longer than three or four hours in the morning; when they are expanded, their petals are so small as to make but little appearance. This sort flowers commonly in the middle of summer, but does not keep any particular month; they are never succeeded by seeds in *England*.

This is propagated by offsets from the roots, which are sent out in plenty; these should be taken off when the roots are transplanted: the time for doing of this is soon after the leaves decay, or before the roots begin to shoot again. They must be planted in small pots, and plunged into the tan-bed in the stove, where they should constantly remain, for they are too tender to thrive in this country, unless they are thus treated. Their after management is the same as for other bulbous-rooted plants from the same countries.

SIUM. *Tourn. Inst. R. H.* 308. *tab.* 162. *Lin. Gen. Plant.* 310. Water Parsnep, and Skirret.

The Characters are,

It hath an umbellated flower; the general umbel is various in different species; the small ones are plain and spreading. The general involucre is composed of several short, spear-shaped, reflexed leaves; those of the smaller are of very small narrow leaves. The general umbel is uniform; the flowers have five inflexed.

inflexed petals, which are equal; they have five stamina, terminated by single summits, and a small germen situated under the flower, supporting two reflexed styles, crowned by obtuse stigmas. The germen afterward becomes a roundish, oval, streaked fruit splitting in two, each part containing one streaked seed, plain on one side, and convex on the other.

The Species are,

1. *Sium foliis pinnatis, umbella terminali.* Hort. Cliff. 98. Sium with winged leaves, and the stalk terminated by an umbel; or the great Water Parsnep.

2. *Sium foliis pinnatis serratis, umbella terminali.* Sium with winged sawed leaves, and umbels terminating the stalks.

3. *Sium foliis pinnatis, umbellis axillaribus sessilibus.* Hort. Cliff. 98. Sium with winged leaves, and umbels of flowers sitting close to the wings of the stalks.

4. *Sium foliis pinnatis, floralibus ternatis.* Hort. Cliff. 98. Sium with winged lower leaves, but those under the flowers trifoliate; called Skirrets.

5. *Sium foliis linearibus decurrentibus connatis.* Hort. Cliff. 98. Sium with linear small leaves, having running membranes, joining at their base round the stalk.

6. *Sium foliis radicalibus ternatis, caulinis bipinnatis.* Prod. Leyd. 105. Sium with trifoliate bottom leaves, and those on the stalks doubly winged.

The first sort is the great Water Parsnep, which grows naturally in deep standing waters in several parts of *England*; it rises with upright stalks five or six feet high, garnished with large winged leaves, shaped like those of the common Parsnep; the stalk is terminated by large umbels of pale yellow flowers.

The second sort is the common upright Parsnep, which grows naturally in ditches in most parts of *England*; this rises with an upright branching stalk three feet high, garnished with winged leaves, composed of three or four pair of oblong sawed lobes, terminated by an odd one. The stalk is terminated by an umbel of white flowers, which are succeeded by seeds, which ripen in autumn; this is rarely cultivated, as it is a common weed in ditches and standing waters. Both these plants have been recommended by ancient physicians for their virtues in medicine, but at present they are seldom used.

The third sort is very common upon standing waters in most parts of *England*. The stalks spread over the surface, and produce umbels of white flowers at their joints. This is the plant which is frequently gathered and sold for Water Cress, as is before mentioned under the article *SISYMBRIUM*.

The fourth sort is the common Skirret, which was formerly more cultivated in the *English* gardens than at present. The roots are the only part used, and although it is mentioned in most Dispensaries as a medicinal plant, yet it is rarely used as such, being better adapted for the kitchen. It is esteemed a wholesome root, affording good nourishment, but has a flatulency, and its very sweet taste is disagreeable to many palates.

The root of this plant is composed of several fleshy fibres, as large as a man's little finger, which join together in one head. The lower leaves are winged, having two or three pair of oblong lobes, terminated by an odd one; the stalks rise a foot high, terminated by an umbel of white flowers, which are succeeded by striated seeds like those of Parsley, which ripen in autumn.

This plant is cultivated two ways, first by seeds, and afterward by slips from the root: the former method I think the more eligible, because the roots which are raised from seeds, generally grow larger than those raised by slips, and are less subject to be sticky. The seeds should be sown the latter end of *March*, or the beginning of *April*, either in broad cast or in drills; the ground should be light and moist,

for in dry land the roots are generally small, unless the season proves very moist. If the seeds are good, the plants will appear in five or six weeks after they are sown, and, when they have put out their leaves so as to be well distinguished from the weeds, the ground should be hoed over to destroy the weeds in the same manner as is practised for Carrots; and where the seeds are sown in broad cast, the plants should be cut up, leaving them two or three inches asunder. Those sown in the drills should also be thinned to the same distance, and the ground hoed over to destroy the weeds. This should be repeated three times, as is usually done for Carrots, which, if well performed in dry weather, will keep the ground clean all the first part of the summer, so that, unless there should be much rain about *Midsummer*, there will be scarce any necessity for farther cleaning of the plants, for their leaves will spread, and prevent the growth of weeds afterward. In autumn, when the leaves begin to decay, the roots will be fit for use, and may be continued all the winter till they begin to shoot in the spring, when they will become sticky, as will also any of those which run up to seed the first summer, so that all such should be pulled up and thrown away.

The time for propagating this plant by offsets is in the spring, before they begin to shoot, at which time the old roots should be dug up, and the side roots should be slipped off, preserving an eye or bud to each; these should be planted in rows one foot asunder, and four inches distant in the rows. If the ground is light, this may be performed with a dibble, but for stiff land it will be best to make a trench with a spade, in the same manner as for Asparagus, laying the roots therein at a proper distance. The ground must be kept clean by hoeing it in the same manner as before directed, and at the same season the roots will be fit for use.

The fifth sort is a perennial plant, which grows naturally in *Germany*. The roots of this plant creep and spread very far under ground; the least part of them will grow, so that when it is once brought into a garden, it will soon multiply; they are thick, fleshy, and taste like those of Eryngo. The leaves are divided into linear segments, and their base embrace the stalks, which rise two feet high, and are terminated by large flat umbels of white flowers, but their seeds do not often ripen here.

The sixth sort grows naturally in *Sicily*, and is preserved in botanick gardens for the sake of variety. The lower leaves are pretty broad, trifoliate, and of a lucid green; the stalks rise two feet high, terminated by an umbel of yellow flowers; the leaves on the stalks are doubly winged, and the seeds ripen in autumn, which should be sown soon after they are ripe.

SMALLAGE. See Apium.

SMILAX. Town. Inst. R. H. 654. tab. 421. Rough Bindweed.

The Characters are,

It is male and female in different plants. The male flowers have a six-leaved bell-shaped empalement, but no petals; they have six stamina, terminated by oblong summits. The female flowers have the like empalement, but they fall off; they have no petals or stamina, but have an oval germen, supporting three very small styles, crowned by oblong reflexed stigmas. The germen afterward turns to a globular berry with two cells, containing two globular seeds.

The Species are,

1. *SMILAX caule aculeato angulato, foliis dentato-aculeatis cordatis.* Lin. Sp. Plant. 1028. Smilax with an angular prickly stalk, and heart shaped, prickly, indented leaves.

2. *SMILAX caule aculeato angulato, foliis cordatis inermibus.* Smilax with an angular prickly stalk, and smooth heart-shaped leaves.

3. SMILAX

3. *SMILAX caule aculeato angulato, foliis inermibus retusocordatis.* Smilax with an angular prickly stalk, and retuse, heart-shaped, unarmed leaves.

4. *SMILAX caule aculeato tereti, foliis inermibus cordatis oblongis multinerviis.* Lin. Sp. Plant. 1030. Smilax with a taper prickly stalk, and oblong, heart-shaped, unarmed leaves, with many veins.

5. *SMILAX caule aculeato teretiusculo, foliis inermibus ovato-cordatis.* Lin. Sp. Plant. 1029. Smilax with a taper prickly stalk, and oval, heart-shaped, unarmed leaves.

6. *SMILAX caule subaculeato tereti, foliis inermibus cordatis trineriviis.* Smilax with a taper stalk, having a few small thorns, and unarmed heart-shaped leaves, with three veins.

7. *SMILAX caule aculeato tereti, foliis inermibus sagittatis obtusiusculis trineriviis.* Smilax with a prickly taper stalk, and very blunt, halberd-pointed, unarmed leaves.

8. *SMILAX caule aculeato tereti, foliis ovato-lanceolatis nervis foliorum infernè aculeatis.* Smilax with a taper prickly stalk, and oval spear-shaped leaves, whose veins on the under side are prickly.

9. *SMILAX caule aculeato angulato, foliis lanceolatis inermibus, acuminatis.* Smilax with an angular prickly stalk, and spear-shaped, acute-pointed, unarmed leaves.

10. *SMILAX caule inermi tereti, foliis inermibus ovato-cordatis quinquenerviis floribus corymbosis.* Rough Bindweed with a taper unarmed stalk, oval, heart-shaped, unarmed leaves, and flowers in a corymbus.

11. *SMILAX caule inermi tereti, foliis inermibus ovatis trineriviis.* Smilax with an unarmed taper stalk, and oval unarmed leaves with three veins.

12. *SMILAX caule inermi tereti, foliis inermibus oblongo-cordatis trineriviis.* Smilax with a taper unarmed stalk, and oblong, heart-shaped, unarmed leaves with three veins.

13. *SMILAX caule inermi tereti, foliis inermibus ovato-cordatis trineriviis, floribus corymbosis.* Smilax with a taper unarmed stalk, oval, heart-shaped, unarmed leaves, and flowers in a corymbus.

14. *SMILAX caule inermi tereti, foliis inermibus cordato-oblongis trineriviis cum acumine.* Smilax with a taper unarmed stalk, and heart shaped oblong leaves, having three veins, ending with acute points.

15. *SMILAX caule inermi tereti, foliis inermibus, caulinis cordatis, racemis ovato-oblongis.* Lin. Sp. Plant. 1031. Smilax with an unarmed taper stalk, unarmed heart-shaped leaves on the stalks, and oval oblong bunches of flowers.

16. *SMILAX caule inermi tereti, foliis inermibus lanceolatis.* Smilax with a taper unarmed stalk, and spear-shaped unarmed leaves.

The first sort grows naturally under hedges and in woods in *Italy* and *Spain*. The roots are composed of many thick fleshy fibres, from which come out several slender stalks which are angular, armed with short crooked spines, and have clasps on their sides, by which they fasten themselves to any neighbouring plant for support, and rise six or eight feet high. The leaves are stiff, heart-shaped, and acute-pointed, eared at their base; they are of a dark green, and have five longitudinal veins; their edges are set with a few short reddish spines. The flowers come out from the wings of the stalk in short bunches, which are small and whitish, having no petals. Those on the female plants are succeeded by red berries, which ripen in autumn.

The second sort grows naturally in *Syria*. The roots of this are like those of the former; the stalks are four-cornered and prickly; these fasten themselves to the trees near them by their clasps, and mount to their tops. The leaves are heart shaped; they have no spines on their edges, but have five veins running lengthways. The flowers and fruit are like those of the first sort.

The third sort grows naturally in *Virginia*. The roots of

this are like those of the former; the stalks are angular and prickly; the leaves are heart-shaped, turning backward, and unarmed; the flowers are small, in long loose bunches at the wings of the stalks: the berries are small and red.

The fourth sort grows naturally in *Carolina*. The roots are like the former; the stalks are taper and prickly; the leaves are oblong, heart-shaped, having no spines, but longitudinal veins; the flowers come out in long loose bunches from the side of the stalks, and the berries are black.

The fifth sort grows naturally at *Carthagera* in *New Spain*: The stalks are taper, very strong, and armed with short stiff spines; they fasten themselves by their clasps to the neighbouring trees, and rise twenty feet high. The leaves are of a thick substance, and have no spines; they are oval, heart-shaped, ending in an obtuse point, and have three longitudinal veins. The flowers are like those of the other species, but grow in close bunches; the berries are red. This is the same with a plant which I received from *China* by the title of *China Root*.

The sixth sort grows naturally at *Carthagera* in *New Spain*. This has very strong taper stalks, armed with a very few short spines. The leaves are thick, unarmed, and heart-shaped, their base ending with acute points. This sort climbs on the neighbouring trees, and rises thirty feet high.

The seventh sort grows naturally at *La Vera Cruz* in *New Spain*; this hath a thick, taper, prickly stalk, which climbs up the neighbouring trees to the height of thirty or forty feet. The leaves are thick, stiff, unarmed, and have two round ears at their base; they have three longitudinal veins, and stand on short foot-stalks.

The eighth sort grows naturally at *La Vera Cruz*; this has slender, taper, prickly stalks, which fasten themselves to any neighbouring support by their clasps, and rise eight or ten feet high. The leaves are oval, spear-shaped; they have no spines on their edges, but their midrib and veins on the under side are armed with short reddish spines.

The ninth sort grows naturally in *Jamaica*. The stalks of this are slender, angular, and prickly; the leaves are spear-shaped, ending in acute points, having no spines; their base is a little rounded, but have no ears.

The tenth sort grows naturally at *La Vera Cruz* in *New Spain*. The stalks of this are taper and unarmed; the leaves are oval, heart-shaped, having five longitudinal veins; they have no spines, and stand on short foot-stalks. The flowers come out from the wings of the stalk in round bunches, which are succeeded by red berries.

The eleventh sort grows naturally in *Jamaica*; this has thick, fleshy, creeping roots. The stalks are taper and unarmed; these climb up the neighbouring trees and bushes to the height of ten or twelve feet. The leaves are oval, ending in acute points, and have three longitudinal veins, but no spines.

The twelfth sort grows naturally in *Jamaica*. The stalks of this are very slender and taper, having no thorns; these branch out greatly, and rise over the neighbouring bushes, having very long clasps, which twine about their branches. The leaves are oblong, heart-shaped, with three longitudinal veins, ending in acute points, of a lucid green, and pretty thick consistence.

The thirteenth sort grows naturally in *Carolina*; this has taper unarmed stalks, which rise three or four feet high. The leaves are oval, heart-shaped, and have three longitudinal veins. The flowers come out from the wings of the stalk at every joint, standing upon short foot-stalks, formed in a round bunch; these are succeeded by roundish red berries.

The fourteenth sort grows naturally in *Jamaica*. The stalks of this are taper, branching, and unarmed; the leaves are heart-shaped, oblong, and have three longitudinal

nal veins, ending with acute points, of a lucid green, and stand upon short foot-stalks.

The fifteenth sort grows naturally in *Jamaica*, and also in *Maryland*. The stalks of this are ligneous, taper, unarmed, and have very long clasps, by which they fasten to any neighbouring support, and rise twenty feet high. The leaves are some oval, and others are heart-shaped. The flowers come out from the wings of the stalk in oblong bunches, which are succeeded by red berries.

The sixteenth sort grows naturally in *Carolina*; this has a thick, taper, unarmed stalk, which rises by the help of neighbouring bushes and trees ten or twelve feet high. The leaves are thick, spear-shaped, and unarmed. The flowers come out from the wings of the stalk in round bunches, which are succeeded by black berries.

These plants are many of them preserved in the gardens of the curious for the sake of variety, but some of them may be disposed as to make them ornamental, especially those sorts which grow naturally in *North America*, and also the two first sorts, which are so hardy as to thrive in the open air in *England*; and, as they retain their verdure all the year, so if the plants are placed on the borders of woods or groves in gardens, and their branches properly supported, they will screen the nakedness of the ground under the trees from sight, and in winter, when their leaves are in beauty, they will make a pleasing variety, when they are properly intermixed with other ever-greens; and, as some of the sorts will rise five or six feet high, they will shut up from view any disagreeable objects.

Those sorts which require a stove to protect them in winter, are little esteemed, because they require much room; and, as their flowers have no beauty to recommend them, few persons care to be at the trouble of preserving them for that of their leaves, because there are many other plants whose leaves make as good an appearance, and the plants do not require so much room, so these are rather proper furniture of botanick gardens than those of pleasure.

They are all propagated by seeds. Those sorts which have been brought from *North America*, frequently produce flowers in *England*, but the summers here are neither warm enough, nor of duration to ripen their seeds, so that these are propagated by parting of their roots; for when the roots have obtained strength, they may be greatly increased, by parting of them early in autumn, that the offsets or young plants may have time to get good roots before the frosts come on; and if after they are planted, the cold should come on earlier, or be more severe than ordinary, if the surface about their roots is covered with some old tanners bark or mulch to keep the frost out of the ground, it will preserve them; but these roots should not be parted oftener than every third or fourth year, for unless the roots are large, there will be few stalks to each, and therefore will make but little appearance.

The tender sorts must be kept in pots, and plunged into the tan-bed of the bark-stove, to have them strong; for although they will live in a moderate warmth in winter, they will make but little progress, and their stalks will be short, their leaves small, and the plants weak, so will make but a poor appearance; therefore, unless they can be allowed room in the warm stove, and constantly kept in the tan-bed, they will not be worth preserving.

As all the sorts grow naturally under hedges, and in woods, they should be disposed in such a manner, as to imitate their places of growth, and not place them in the open sun, where they will not thrive; therefore the hardy kinds should be planted under the shade of trees, and the tender ones may be placed between the pots which contain tall plants, whose branches may screen them from the sun.

When the seeds of these plants are obtained from abroad, they should be sown in pots, and plunged into a moderate hot-bed; these generally remain in the ground a whole year before they grow, so that when the plants do not come up the first season, the pots in which the hardy sorts are sown, should be in winter sheltered from frost under a common frame, and the tender ones plunged into the bark-bed in the stove: the following spring they must be again plunged into the hot-bed, which will bring the plants up very soon. When they are come up, they must be inured to the open air by degrees, and in *June* the hardy sorts may be removed out of the bed, and placed abroad in a sheltered situation, where they should remain till the frost comes on in autumn, when they must be removed into shelter. If the pots are plunged into an old tan-bed under a frame where they may be protected from the frost, and in mild weather be exposed to the open air, they will thrive much better than with more tender treatment.

The tender sorts should be plunged between the other pots in the bark-bed of the stove, where they should remain all the winter. These plants should remain untransplanted in the seed-pots till the following spring, when they should be turned out of the pots, carefully separated, and each planted in a pot; and if the hardy sorts are plunged into a very temperate hot-bed, it will cause them to take new root very soon, so will greatly strengthen the plants; but the tender sorts should be plunged into a good hot-bed of tanners bark to bring the plants forward, that they may get strength before winter, when they must be treated in the manner before directed.

The hardy sorts should be kept in pots for two years, that they may be sheltered in winter, by which time they will have strength enough to bear the cold in the open air, so in the spring they may be turned out of the pots, and planted where they are designed to remain, observing, if the spring should prove dry, to refresh them now and then with water.

SMYRNIUM. *Tourn. Inst. R. H. 315. tab. 168.* Alexanders, or Alifanders.

The Characters are,

It has an umbellated flower; the principal umbel is unequal, the small ones are erect; they have no involucre, and the empalement of the flowers are scarce discernible. The flowers have five spear-shaped petals, which are a little inflexed, and five stamina the length of the petals, terminated by single summits. The germen is situated under the flower, supporting two styles, crowned by beaded stigmas. The germen afterwards turns to an almost globular fruit, which is streaked and splits in two, each containing one moon-shaped seed, convex on one side, marked with three streaks, and plain on the other.

The Species are,

1. SMYRNIUM *foliis caulinis ternatis petiolatis serratis.* *Hort. Cliff. 105.* Smyrnum with trifoliate leaves on the stalks, which are sawed and have foot-stalks; or common Alexanders, or Alifanders.
2. SMYRNIUM *foliis caulinis orbiculatis integerrimis amplexicaulibus.* Smyrnum with orbicular leaves on the stalks, which embrace them.
3. SMYRNIUM *foliis caulinis cordato-ovatis dentatis amplexicaulibus.* Alexanders with heart-shaped oval leaves, which are indented, embracing the stalks.
4. SMYRNIUM *foliis caulinis ternatis serratis, summis oppositis sessilibus.* Alexanders with leaves by threes, which are sawed, and those at the top by pairs, sitting close to the stalks.
5. SMYRNIUM *foliis caulinis duplicato ternatis integerrimis.* *Lin. Sp. Plant. 263.* Alexanders with double trifoliate leaves on the stalks, which are entire.

The first sort grows naturally on the rocks by the sea-shore in *Wales*, the north of *England*, and in *Scotland*. It is also found growing wild in many places near *London*, but here it may be supposed to have been thrown out of gardens; for as it was formerly cultivated in gardens for the table, so the seeds may have been scattered, which will grow where-ever they alight.

The lower leaves of this plant resemble those of Smal-lage, but they are much larger; the lobes are rounder, and are sawed on their edges. The stalk rises from three to four feet high, furrowed, and branch into many divisions, garnished with trifoliate leaves of the same shape and form with the lower, but are smaller. The branches are terminated by large umbels of white flowers, which are succeeded by large roundish fruit, containing two moon-shaped seeds.

The second sort grows naturally in *Sicily* and *Crete*; the lower leaves of this sort are decomposed of small leaves, which divide by threes; their lobes are oval and indented on their edges; the stalk is smooth, hollow, and rises three feet high, dividing toward the top into two or three branches; at each joint is placed one large orbicular leaf, whose base embrace the stalk; these are of a yellow green colour, and their edges are entire; the branches are terminated by small umbels of yellowish flowers, whose smaller umbels or rays are of unequal lengths. The seeds are black, and shaped like those of the former, but are smaller.

The third sort grows naturally in *Crete*; the lower leaves of this are larger than those of the former, but are composed of several winged divisions. The stalk does not rise so high as that of the last mentioned, but is angular, and not so hollow; the leaves upon the stalks are much larger; they are of the heart-shaped oval kind, are indented on their edges, and embrace the stalks with their base; their colour is nearly the same with the former, but they are of a thinner texture. The umbels of flowers are smaller, as are also the seeds.

These two sorts have been frequently blended together by botanists, who have supposed they were but one species; but I have cultivated both many years, and have not found either of them alter.

The fourth sort grows naturally in *Crete*; the lower leaves of this are smaller than those of the first sort, and are more like those of Smal-lage; the stalk rises higher, and grows more erect than those of the first; the leaves on the lower part of the stalk are large, and sawed on their edges; they stand by threes round the stalk at the joints, their base set close, having no foot-stalks; the upper part of the stalk and branches are garnished with leaves of the same form, which stand by pairs. The umbels of flowers are much smaller, and the seeds are less.

The first of these sorts is that ordered by the College for medicinal use, but is seldom now prescribed; and at present is seldom cultivated in gardens, though formerly it was greatly used in the kitchen, before Celery was so much cultivated, which hath taken place of Alexanders, and entirely supplanted it. The other sorts are preserved in botanick gardens for variety. The second sort is much preferable to the first for blanching, as I have tried, and will be tenderer, and not quite so strong.

All these plants may be propagated by sowing their seeds upon an open spot of ground in *August*, as soon as they are ripe; for if they are sown in spring, they often miscarry, or at least do not come up until the second year; whereas those sown in autumn, rarely fail of coming up soon after *Christmas*, and will make much stronger plants than the other.

The common sort when cultivated for the table, should be treated in the following manner:

In the spring the plants should be hoed out, so as to leave

them ten inches or a foot apart each way; and, during the following summer, they must be constantly cleared from weeds. In *February* following the plants will shoot up again vigorously, at which time the earth must be drawn up to each plant, to blanch them, and in three weeks after they will be fit for use; when they may be dug up, and the white part preserved, which may be stewed and eaten as Celery.

SNAP-DRAGON. See *Antirrhinum*.

SNEEZ-WORT. See *Achillea*.

SNOW is defined to be a meteor formed in the middle region of the air, of vapour raised by the action of the sun, or subterraneous fire, there congealed, its parts constricted, its specific gravity increased, and thus returned to the earth in the form of little villi or flakes.

The snow we receive may properly enough be ascribed to the coldness of the atmosphere through which it falls; when the atmosphere is warm enough to dissolve the snow before it arrives at us, we call it rain; if it preserves itself undissolved, we call it snow.

Snow is very useful; it fructifies the ground; it guards Corn, or other vegetables, from the intenser cold of the air, especially the cold piercing winds.

It is supposed to abound with salific and fertile particles, as much or more than rain; however, it is accounted more ponderous, and by that means sinks deeper in the ground than rain does, and therefore is in some cases of more benefit to planting; for which reason, some lay heaps of snow round the feet of the forest trees, especially in hot burning lands.

SNOWDROP. See *Galanthus*.

SOIL. See *Earth*.

SOLANOIDES. See *Piercea*.

SOLANUM. *Tourn. Inst. R. H. 148. tab. 62.* Nightshade.

The Characters are,

The impalement of the flower is permanent, of one leaf. The flower has one wheel-shaped petal, having a very short tube; the brim is large, spreading, and five-pointed. It has five oval-shaped stamina, terminated by oblong summits, which stand together, and a roundish germen, supporting a slender style longer than the stamina, crowned by an obtuse stigma. The germen afterward turns to a roundish berry with two cells, having a convex fleshy receptacle, filled with roundish compressed seeds.

The Species are,

1. SOLANUM caule inermit herbaceo, foliis ovatis acuminatis glabris, umbellis nutantibus. Nightshade with an herbaceous unarmed stalk, smooth oval-pointed leaves, and nodding umbels; common Nightshade with black fruit.

2. SOLANUM caule inermit herbaceo, foliis ovatis dentato-angulatis, umbellis nutantibus. Nightshade with an herbaceous unarmed stalk, oval, angular, indented leaves, and nodding umbels; Nightshade with red fruit.

3. SOLANUM caule inermit herbaceo, foliis ovato-lanceolatis acuminatis tomentosis, umbellis nutantibus. Nightshade with an herbaceous unarmed stalk, oval, spear-shaped, acute-pointed, indented, woolly leaves, and nodding umbels; Nightshade with yellow berries.

4. SOLANUM caule inermit herbaceo glabro, foliis oblongo-ovatis acuminatis, dentatis glabris, umbellis nutantibus. Nightshade with an herbaceous, unarmed, smooth stalk, oblong, oval, acute-pointed, indented, smooth leaves, and nodding umbels.

5. SOLANUM caule inermit herbaceo, foliis ovatis acuminatis glabris, umbellis erectis. Nightshade with an herbaceous unarmed stalk, oval, acute-pointed, smooth leaves, and erect umbels.

6. SOLANUM caule herbaceo subaculeato, foliis ovatis obtusis integerrimis, petiolis longissimis, umbellis nutantibus. Nightshade

shade with an herbaceous prickly stalk, oval, obtuse, entire leaves on very long foot-stalks, and nodding umbels.

7. SOLANUM caule inermi herbaceo, foliis oblongo-ovatis acuminatis glabris subdentatis, umbellis nutantibus. Nightshade with an herbaceous unarmed stalk, oblong, oval, acute-pointed, smooth leaves, a little indented, and nodding umbels.

8. SOLANUM caule inermi frutescente flexuoso, foliis superioribus hastatis, racemis cymosis. Hort. Cliff. 60. Nightshade with a shrubby, flexible, unarmed stalk, the upper leaves spear-shaped, and bunches of flowers at the top of the stalk; commonly called Bitter-sweet.

9. SOLANUM caule inermi fruticoso, foliis lanceolatis repandis, umbellis sessilibus. Lin. Sp. Plant. 184. Nightshade with a shrubby unarmed stalk, spear-shaped leaves turning inward, and the umbels fitting close to the stalks; commonly called Amomum Plinii.

10. SOLANUM caule aculeato fruticoso, foliis lanceolatis anguloso-dentatis. Hort. Cliff. 61. Nightshade with a shrubby prickly stalk, and spear-shaped leaves, which are angularly indented.

11. SOLANUM caule aculeato fruticoso, foliis ovatis dentato-angulatis utrinque tomentosis, pedunculis spinosis. Nightshade with a shrubby prickly stalk, oval, angular, indented leaves, woolly on every side, and prickly foot-stalks to the flowers.

12. SOLANUM caule aculeato fruticoso, foliis pinnato-lacinatis obtusis utrinque aculeatis. Nightshade with a shrubby prickly stalk, wing-cut leaves, which are obtuse, and have spines on both sides; commonly called Pomum Amoris.

13. SOLANUM caule aculeis recurvis, foliis sinuatis subtus tomentosis, utrinque aculeatis, pedunculis aculeatis. Lin. Flor. Zeyl. 95. Nightshade with recurved thorns on the stalks, and sinuated leaves, downy on their under side, armed with prickles on both sides, and the foot-stalks of the flowers are prickly.

14. SOLANUM caule aculeato, foliis pinnato-sinuatis, fructu racemoso. Nightshade with prickly stalks, leaves cut into wing-points, and the fruit disposed in oblong bunches.

15. SOLANUM caule aculeato herbaceo, foliis sinuatis glabris, utrinque aculeatis, umbellis erectis, calycibus echinatis. Nightshade with a prickly herbaceous stalk, smooth sinuated leaves armed with spines on both sides, upright umbels, and very prickly empalements.

16. SOLANUM caule aculeato fruticoso, foliis pinnato-lacinatis tomentosis, utrinque aculeatis, pedunculis axillaribus bifloris. Nightshade with a prickly shrubby stalk, wing-cut leaves which are woolly, prickly on both sides, and foot-stalks with two flowers at the wings of the stalk.

17. SOLANUM caule aculeato fruticoso, foliis oblongis sinuato-pinnatis, aculeatis, umbellis sessilibus. Nightshade with a prickly shrubby stalk, oblong, wing-sinuated, prickly leaves, and umbels fitting close to the stalks.

18. SOLANUM caule aculeato fruticoso, foliis ovatis tomentosis, anguloso-sinuatis subaculeatis, umbellis sessilibus. Nightshade with a prickly shrubby stalk, oval, woolly, angular, sinuated leaves a little prickly, and umbels fitting close to the stalks.

19. SOLANUM caule aculeato fruticoso, foliis lanceolatis subdentatis glabris, racemis longioribus axillaribus. Nightshade with a prickly shrubby stalk, smooth spear-shaped leaves a little indented, and longer bunches of flowers from the wings of the stalk.

20. SOLANUM caule aculeato fruticoso, foliis ovato-oblongis acuminatis tomentosis, umbellis erectis axillaribus. Nightshade with a shrubby stalk armed with a few spines, oval, oblong, woolly leaves, and erect umbels from the wings of the stalk.

21. SOLANUM caule inermi frutescente flexuoso, foliis ovatis subtus tomentosis, floribus solitariis alaribus. Nightshade with a shrubby, bending, unarmed stalk, oval leaves which are woolly on their under side, and flowers growing singly from the wings of the stalk.

22. SOLANUM caule inermi fruticoso, foliis ovatis acuminatis integerrimis, subtus tomentosis, umbellis erectis alaribus & terminalibus. Nightshade with a shrubby unarmed stalk, oval, acute-pointed, entire leaves, which are woolly on their under side, and erect umbels from the wings and the top of the branches.

23. SOLANUM caule aculeato fruticoso, foliis ovatis sinuato-dentatis subtus tomentosis, aculeis utrinque rectis, umbellis sessilibus terminalibus. Nightshade with a prickly shrubby stalk, oval, sinuated, indented leaves, which are woolly on their under side, the spines every way strait, and umbels sitting close at the end of the branches.

24. SOLANUM caule inermi fruticoso, foliis ovato lanceolatis integerrimis subtus tomentosis, umbellis erectis pedunculis longissimis. Nightshade with a shrubby unarmed stalk, oval, spear-shaped, entire leaves, which are woolly on their under side, and erect umbels having very long foot-stalks.

25. SOLANUM caule frutescente subinermi, foliis cuneiformibus sinuato-repandis. Lin. Sp. Plant. 185. Nightshade with a shrubby almost unarmed stalk, and wedge-shaped leaves which are sinuated, and turn backward.

26. SOLANUM caule frutescente inermi, foliis lanceolatis sinuato-dentatis glabris, umbellis erectis. Nightshade with a shrubby unarmed stalk, spear-shaped, sinuated, indented, smooth leaves, and erect umbels.

27. SOLANUM caule inermi fruticoso, foliis ovatis integerrimis, pedunculis lateralibus filiformibus. Lin. Sp. Plant. 185. Nightshade with a shrubby unarmed stalk, oval entire leaves, and thread-like foot-stalks to the flowers, proceeding from the side of the branches.

28. SOLANUM caule inermi frutescente flexuoso, foliis ovatis subdentatis crassis. Nightshade with a shrubby, flexible, unarmed stalk, and oval thick leaves somewhat indented.

29. SOLANUM caule frutescente inermi, foliis lanceolatis integerrimis subtus pilosis, umbellis erectis terminalibus. Nightshade with a shrubby unarmed stalk, spear-shaped entire leaves, which are hairy on their under side, and erect umbels terminating the branches.

30. SOLANUM caule inermi fruticoso, foliis ovatis integerrimis, subtus tomentosis, umbellis erectis terminalibus, calycibus obtusis lanuginosis. Nightshade with a shrubby unarmed stalk, oval entire leaves, which are woolly on their under side, erect umbels terminating the branches, and downy obtuse empalements.

31. SOLANUM caule aculeato, foliis oblongo-ovatis; dentato-sinuatis, subtus pilosis, umbellis lateralibus. Nightshade with a shrubby prickly stalk, oblong oval leaves, with sinuated indentures, hairy on their under side, and umbels on the side of the branches.

32. SOLANUM caule aculeato fruticoso, foliis sinuato-dentatis, racemis lateralibus, aculeis utrinque incurvis. Nightshade with a prickly shrubby stalk, leaves with sinuated indentures, bunches of flowers on the side of the branches, and the spines every where recurved.

33. SOLANUM caule aculeato fruticoso, foliis sinuatis obtusis, utrinque tomentosis, floribus racemosis terminalibus. Nightshade with a shrubby prickly stalk, obtuse sinuated leaves, which are woolly on both sides, and flowers in loose bunches terminating the branches.

34. SOLANUM caule aculeato herbaceo, foliis laciniatis dentatis tomentosis, utrinque aculeatis, calycibus tomentosis. Nightshade with a prickly herbaceous stalk, cut leaves which are indented, woolly, and armed with spines on both sides, and woolly empalements.

35. SOLANUM caule aculeato herbaceo, foliis cordatis quinquelobis, utrinque villosis aculeatis. Vir. Cliff. 15. Nightshade with a prickly herbaceous stalk, and heart-shaped leaves with five lobes, which are hairy and prickly on both sides.

36. SOLANUM caule herbaceo erecto inermi, foliis ovato lanceolatis anguloso-dentatis floribus lateralibus. Nightshade with an herbaceous, erect, unarmed stalk, oval spear-shaped leaves angularly indented, and flowers on the side of the stalks.

The first sort is now very common upon dunghills, and on rich cultivated soils, in many parts of *England*, where it often becomes a very troublesome weed. This is the sort which the College of Physicians have directed to be used in medicine, under the title of *Solanum hortense*: and although it is now become a very troublesome weed in many gardens near *London*, yet it is not a native of this country, but is supposed to have been brought originally from *America*, from whence the greater part of the species of this genus have been introduced into *Europe*.

There are two varieties of this, which are found growing naturally in *England*. The most common sort is an upright plant with oval, acute-pointed, smooth leaves, and black berries. The other is a low branching plant with indented leaves, and greenish yellow berries, but whether these are only varieties, or distinct species, I cannot say, though I have sown their seeds separately, and have found them keep their difference, but do not know if they will continue it always.

The second sort rises with an erect branching stalk three feet high; the leaves are oval, angular, indented, and smooth; the flowers are white, produced in roundish bunches, in form of umbels, having five star-pointed petals, which are reflexed; in the center are five stamina, which are terminated by oblong yellow summits standing close together; after the flowers are past, the germen will swell to round pulpy berries of a deep red colour, standing in nodding umbels on the side of the branches.

The third sort rises with hairy branching stalks two feet high; the leaves are woolly, oval, spear-shaped, acute-pointed, and indented on their edges; the flowers are like those of the former sort; the berries are smaller, and of a dirty yellow colour. The seeds of this came from *America*.

The seeds of the fourth sort came from the *West-Indies*; this hath taller and smoother stalks than either of the former; the leaves are of a dark green, smooth, oval, acute-pointed, and indented on their edges in angular indentures; the flowers are produced in umbels on the side of the branches, which are succeeded by smooth red berries.

The fifth sort grows naturally in *Virginia*; the stalks of this are angular, and rise upward of three feet high, dividing into a few slender spreading branches, garnished with oval, acute-pointed, smooth leaves, of a deep green colour, with a few indentures on their edges; the flowers are very small, and but few in each umbel; they have narrow acute-pointed petals, white on the inside, and purplish without, and are succeeded by small black berries, which ripen late in autumn.

The sixth sort grows naturally in *North America*. The stalks of this sort rise three feet high, and divide into spreading angular branches, having a few short spines; the leaves are oval and entire, of a dark green colour, and have long foot-stalks; the flowers come out from the side of the branches in small umbels, which nod on one side; they are star-pointed, and are succeeded by small black berries, which ripen late in the autumn.

The seventh sort grows naturally in *Guinea*. This rises with a strong, thick, angular, herbaceous stalk two feet high, dividing into short thick branches, garnished with oblong, oval, smooth, indented leaves, standing upon pretty long foot-stalks. The flowers are produced in nodding umbels from the side of the stalk; they are like those of the first sort, but are larger. These are succeeded by large black berries the size of the common black Cherry, which ripen in autumn.

These seven sorts are annual, so their seeds should be sown in the spring, on a bed of rich earth, where the plants are designed to remain; and when they come up, they must be thinned, leaving them at least two feet distance, that they may have room to grow; after this they will require no farther care, but to keep them clean from weeds; in *July* and *August* they will flower, and the seeds will ripen in autumn. Some people plant one or two plants of each sort in pots, whose stalks they train up to sticks, to make them strait; and in autumn they remove the pots into the green-house, where they may be preserved till the spring, and during the winter, their fruit being ripe, will make a pretty appearance.

The eighth sort is a climbing woody plant, which grows in the hedges in divers parts of *England*, and is by some planted in gardens to cover arbours, or shady walls, in *London*, and other close places, where few other plants will thrive. The cuttings or stalks of this are put into glasses of water, and placed in rooms, where they will put out branches and leaves, and continue a long time green. This plant is also used in medicine, for some particular preparations; but the herb folks in the markets often sell this instead of the Garden Nightshade, which is a cooling plant, but this a hot acrid one, which renders it contrary to the intention of the ointment, wherein Nightshade is one of the ingredients.

There is a sort of this with white flowers, which is supposed to be a variety of the former, but the leaves are woolly, in which it differs from the other, and this is constant. There is also one with variegated leaves, which is preserved by those who are very curious in collecting the various kinds of striped-leaved plants.

These may be easily propagated by planting their cuttings in the spring upon a moist soil, where they will soon take root, and may afterward be transplanted where they are to remain.

The ninth sort grows naturally at the *Madeiras*; this rises with a strong woody stalk four or five feet high, dividing into many slender stiff branches, garnished with spear-shaped leaves, turning backward; the flowers grow in small umbels, or singly on the side of the branches, to which they sit close. These are succeeded by berries as large as small Cherries, which ripen in winter, when they make a good appearance in the green-house. There are two varieties of this, one with a red, and the other has a yellowish fruit.

This plant may be propagated by sowing its seeds in a pot of rich earth in the spring, placing it upon a moderate hot bed, which will greatly facilitate their growth. When the plants are come up, you should make a gentle hot-bed, covered with rich earth about six inches thick; in this they should be planted about six inches distance each way, and the bed arched over with hoops, &c. and covered with mats, to shade them from the sun and cold, observing frequently to water them.

When the plants have acquired strength, and the season becomes favourable, you must inure them to bear the open air by degrees, to which they should be fully exposed in summer, when they should be taken up, with a ball of earth to the root, and placed separately in pots, filled with rich earth, and set in a shady situation, until they have taken new root; after which they may be removed into a more open exposure, and placed among other exotic plants; but they require a great plenty of water in dry weather, without which they seldom produce much fruit.

In winter they must be removed into the green-house, and placed in the coldest part of the house, where they may have as much free air as possible in mild weather; being so hardy, as many times to endure the cold of our ordinary winters abroad, when planted in a warm situation;

tion; so that they only require to be sheltered from severe frost.

The tenth sort grows naturally in the *West-Indies*; this rises with a shrubby stalk three feet high, dividing at the top into several branches, closely armed with strait gold coloured spines on every side. The leaves are angularly indented; their midrib is armed with a row of the like spines as those upon the stalks, which stand erect. The flowers are produced in oblong bunches from the side of the stalks, which are succeeded by red berries almost as large as the small black Cherry.

The tenth sort is much tenderer than either of the former, being brought from the warm parts of *America*. This is propagated by seeds, which must be sown upon a good hot-bed; and when the plants are come up, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed again, observing to water and shade them until they have taken root; after which they should have air and water in proportion to the heat of the season.

In *July* these plants may be inured to bear the open air by degrees, into which they may be removed, if the season be warm, otherwise they must be preserved either under glasses, or in the stove; if they are placed in the open air, they should not remain there longer than the middle or latter end of *August*, lest the nights growing cold, should hurt them. During the winter season they must be preserved in the stove, observing to refresh them frequently with water; but they must not have too much each time, especially in cold weather. The second year they will produce flowers and fruit.

The eleventh sort has a shrubby stalk, which rises two feet high, dividing into several woody branches, armed with sharp thorns, garnished with oval woolly leaves, which have angular indentures on their edges. The flowers are produced in small loose bunches from the wings of the stalks; they are blue, and larger than those of the former sorts; these are succeeded by round berries as large as common Cherries, of a gold colour, which turn black when ripe.

The twelfth sort grows naturally at the *Cape of Good Hope*. This hath a strong, thick, shrubby stalk, which rises from two to three feet high, sending out many short thick branches, closely armed with short, strong, yellow spines on every side; the leaves are cut almost to their midrib in obtuse segments, which are opposite, regular, and formed like winged leaves; these segments have several obtuse indentures on their edges; they are of a dark green colour, and armed with the same sort of spines, as those on the stalks on both sides. The flowers come out in small bunches on the side of the branches; they are blue, and larger than those of the former sort, and are succeeded by round yellow berries as large as Walnuts, which ripen in winter.

The eleventh and twelfth sorts are not so tender as the last, but require an open airy glass-case, or a warm greenhouse in winter, but in summer may be exposed in the open air with other exotic plants. These may be propagated by sowing their seeds on a hot-bed as the former, and should be managed as hath been directed for them, with this difference, that they may be much sooner exposed to the air, and should not be treated so tenderly.

The thirteenth sort grows naturally at the *Cape of Good Hope*; this hath a shrubby stalk four or five feet high, covered with a white meally down, dividing into a few straggling branches, armed with short, thick, dark, brown, recurved spines, with yellowish points. The leaves are sinuated, of a bright green on their upper side, but woolly on their under. This sort has not as yet produced any flowers in *England*, though there are large plants of it in the *Chelsea* garden, where they were raised from seeds, which came from the *Cape of Good Hope*.

This may be propagated by seeds: in the same way as the two former, and the plants must be treated in the same way, but they are not so hardy as the two former, so should be placed in a warm stove in winter, and should not have much water in cold weather.

The fourteenth sort has a shrubby stalk, which rises two feet high, sending out several ligneous branches, armed with short, strong, yellowish spines; the leaves are regularly indented, armed with spines on both sides. The flowers come out in longish bunches from the side of the stalks, and are succeeded by round red berries, as large as middling Cherries, which ripen in winter.

The fifteenth sort was discovered by the late Dr. *Houfoun* at *La Vera Cruz*. This rises with a prickly herbaceous stalk two feet high, dividing into two or three branches, closely armed with slender yellow spines of unequal lengths. The leaves are of a bright green colour, deeply sinuated; the veins of the leaves are armed with yellow erect spines on both sides. The umbels of flowers stand erect at the end of the branches; the flowers are very large, of a fine blue colour, and are succeeded by round berries as large as common Cherries, which are marbled with white and green. The empalement of the flower is armed with spines like a hedgehog. The fruit ripens late in the autumn, so that unless the plants are brought forward in the spring, they will not produce ripe seeds in *England*.

The sixteenth sort grows naturally at *La Vera Cruz*; this hath shrubby trailing stalks two feet long; armed with long yellow spines, covered with a gray bark; the leaves are woolly, very finely cut in form of winged leaves almost to their midrib, and armed with long, slender, yellowish spines on their veins on both sides. The foot-stalks of the flowers arise from the wings of the stalks; they are three inches long, for the most part sustaining two large yellow flowers, having very prickly empalements, and are succeeded by small round berries the size of gray Peas, which are marbled with green and white.

The seventeenth sort grows at *La Vera Cruz*; this rises with a shrubby stalk five or six feet high, armed with short recurved spines, covered with a smooth brownish bark, garnished with oblong leaves, which are regularly sinuated on both edges in form of winged leaves, armed with a few short spines along their midrib on both sides. The flowers come out in small loose bunches from the side of the branches, to which they sit close; they have five white star-pointed petals, and are succeeded by small berries about the size of those of Juniper, which, when ripe, are red.

The eighteenth sort grows naturally in *Jamaica*; this rises with a shrubby woolly stalk five or six feet high, armed with short recurved thorns, garnished with oval woolly leaves, angularly sinuated, and have a very few short crooked spines upon the midrib on the under side. The flowers are in small umbels sitting close to the side of the branches; they are yellow, and are succeeded by small round berries, of a Saffron colour when ripe.

The nineteenth sort grows naturally in *Jamaica*; this rises with shrubby stalks three or four feet high, dividing into several irregular branches, which have a gray bark, armed on every side with slender erect spines of a gray colour. The leaves are spear-shaped, smooth, and a little indented or waved on their edges. The flowers come out in long bunches from the side of the stalk, standing upon long foot stalks, of a fine blue colour, and are succeeded by Saffron-coloured berries the size of Peas.

The twentieth sort grows naturally at *La Vera Cruz*; this has a strong shrubby stalk five feet high, covered with a brown woolly bark, armed with a few short spines, sending out several ligneous branches, garnished with oblong, oval, acute-pointed leaves, covered with a brown woolly down.

on both sides. The flowers are large, white, and grow in erect umbels from the side of the branches, and have thick woolly empalements; these are succeeded by yellow berries as large as middling Cherries.

The twenty-first sort grows naturally at *La Vera Cruz*; this has a shrubby climbing stalk ten or twelve feet high, covered with a smooth brown bark, divided into several branches. The leaves are oval, woolly on their under side, but of a dark green on their upper. The flowers come out singly from the wings of the stalk; they are large, of a fine blue colour, and the petal is not divided into segments like those of the other species, but have five angles, each ending in a point; these are succeeded by round berries, about the size of gray Peas, which are red when ripe.

The twenty-second sort grows naturally at *Campeachy*; this hath a smooth shrubby stalk six or seven feet high, sending out ligneous branches, garnished with oval acute-pointed leaves, which are entire, woolly on their under side. The flowers are collected into umbels, which stand erect; these come out from the side and at the end of the branches; they are of a light blue colour, and are succeeded by round berries the size of small black Cherries, which are yellow when ripe.

The twenty-third sort grows naturally at *La Vera Cruz*; this has a shrubby stalk four feet high, with a white downy bark, armed on every side with strait brown spines. The leaves are oval, and have sinuated indentures, woolly on their under side, and have prickly foot-stalks. Their mid-rib is armed with two or three small spines, sometimes on both sides, and at others but on one. The spines are all erect; the flowers are disposed in an umbel sitting close at the end of the branches; they are large, of a fine blue colour, and have woolly empalements; these are succeeded by round berries the size of large Peas, which are red when ripe.

The twenty-fourth sort grows naturally at *Campeachy*; this rises with a woody stalk eight or ten feet high, sending out several ligneous furrowed branches, covered with a gray down. The leaves are sometimes placed alternately on the branches, and at others they are opposite, standing upon pretty long foot-stalks; their edges are entire, end in acute points, and woolly on their under side. The flowers terminate the branches in large erect umbels, standing upon long foot-stalks; they are large, white, and have woolly empalements; these are succeeded by berries the size of Cherries, which turn yellow.

The twelve last mentioned sorts are propagated by seeds in the same manner as the former, but these, being natives of a warm country, must be raised on a hot-bed early in the spring, and when the plants are fit to remove, they must be each planted in a separate small pot, and plunged into a moderate hot-bed of tanners bark, observing to shade them from the sun until they have taken new root; after which they should have a large share of air admitted to them in warm weather, and must be frequently watered. Toward the latter end of *June* it will be proper to harden the plants gradually, and soon after they should be removed into the stove, where they must have as much free air as possible in warm weather, but as the cold approaches in autumn, they must be carefully protected therefrom, and in winter they should be kept in a moderate temperature of warmth, otherwise they will not live in this country.

Some of these sorts will bear to be exposed in the open air in the heat of summer, provided they are placed in a warm situation, but if the season should prove cold, they will not thrive abroad; wherefore it will be better to let them remain in the stove, and open the glasses in front, and at the top of the stove, every day, to admit as much air as possible in hot weather, with which management they will thrive much better than in the open air.

The twenty-fifth sort grows naturally at *Buenos Ayres*; this rises with a woody stalk ten or twelve feet high, covered with a purplish bark, almost smooth. At the top it divides into several erect branches, garnished with wedge-shaped leaves, which are sinuated. The flowers are produced in umbels at the end of the branches; they are large, white, and the petal is angular, but not divided at the brim; these are often succeeded by berries, which change yellow when they are ripe.

The twenty-sixth sort grows naturally in the *Babama Islands*; this rises with a smooth shrubby stalk six or eight feet high, covered with a brown bark, dividing into many branches, garnished with spear-shaped leaves, sinuated on their edges, ending in acute points; they are smooth, of a light green colour. The flowers are produced in small umbels from the side of the stalks, standing erect; they are large, white, and have their petals cut into five star-pointed segments; these are very rarely succeeded by seeds in *England*.

The two last mentioned sorts are not so tender as the twelve former, so may be treated in the same way as the eleventh and twelfth, by housing them in winter with Oranges and other green-house plants, and in summer place them abroad in a sheltered situation; they may be propagated by cuttings, which, if planted in a shady border during any of the summer months, will take root pretty freely, and may then be taken up and potted, placing them in the shade till they have taken new root, and then they may be treated in the same way as the old plants.

The twenty-seventh sort grows naturally on the coast of *Guinea*; this has a shrubby stalk, which rises seven or eight feet high, dividing into many branches. The lower leaves are oblong, oval, smooth, of a dark green colour, and stand upon short foot-stalks; the flowers come out from the side of the branches in small bunches, standing upon very slender foot-stalks; they are of the same shape and colour with those of the *Amomum Plinii*, but smaller, and are sometimes succeeded by berries about the size of small black Cherries, which are yellow when ripe.

This sort requires a stove in winter, and must not be exposed abroad longer than ten or twelve weeks in the warmest part of summer; it may be propagated by cuttings, which, when planted, must be closely covered with a bell or hand-glass, and shaded from the sun, treating them in the same manner as other cuttings of exotick plants.

The twenty-eighth sort grows naturally at the *Cape of Good Hope*; this has shrubby flexible stalks, requiring support like our common woody Nightshade, to which the plant has great resemblance, but the leaves are shorter, thicker, and are more indented on their edges. This sort very rarely flowers in *England*.

It may be easily propagated by cuttings during any of the summer months, and may be preserved in a green-house in winter, treating it in the same way as the *Amomum Plinii*.

The twenty-ninth sort grows naturally at *Campeachy*; this rises with a woody stalk ten or twelve feet high, sending out many branches, having a light gray bark. The leaves are spear-shaped, of a deep green on their upper side, but hoary on their under. The flowers are produced in large umbels at the end of the branches; they are small, star-pointed, and white; their summits, which fill up the mouth of the tube, are purple; these are succeeded by small berries the size of middling Peas, which are yellow when ripe.

The thirtieth sort grows naturally at *Carthagena*; this rises with a shrubby stalk, having a light brown bark, which divides into several irregular ligneous branches, garnished with oval leaves, of a dark green on their upper side, but woolly

woolly on their under. The flowers are produced in large erect umbels at the end of the branches, which are white, and are succeeded by round berries the size of small Cherries, fitting in the blunt woolly empalement of the flower, which turn yellow when ripe.

The thirty-first sort grows naturally at *Carthage*; this rises with a strong shrubby stalk twelve or fourteen feet high. The branches are woody, of a dark brown colour, armed with a few short recurved spines; the leaves are oblong, oval, sinuated on their edges, smooth, of a dark green on their upper side, but their under sides are hairy, of a light green. The flowers come out from the side of the stalk in small umbels; they are white, and the petal is cut into five acute segments almost to the bottom. This has not produced fruit here.

The thirty-second sort grows in the *West-Indies*, and also at the *Cape of Good Hope*. The stalk is shrubby, and rises three feet high, dividing into many ligneous branches, closely armed with short, strong, yellow, recurved spines. The leaves are sinuated, and armed with short crooked spines along their midrib. The flowers are produced in long loose bunches from the side of the stalks; they are white, star-pointed, and are succeeded by berries the size of small black Cherries, of a gold colour when ripe. This sort is propagated by seeds, and may be kept in a warm green-house in winter, and in summer placed in the open air.

The thirty-third sort grows naturally at *Carthage*; this has a shrubby stalk, which rises five or six feet high, sending out many branches, armed with a few short recurved spines. The leaves are deeply sinuated, and covered on both sides with a brown woolly down, which is a little lighter-coloured on the under side. The flowers are produced in pretty large bunches at the end of the branches; they are large, of a bright purple colour. The fruit is yellow when ripe, the size of gray Peas. I have also received the seeds of this from *Bermuda*.

These sorts are propagated by seeds, and require the same treatment as the tender sorts before mentioned.

The thirty-fourth sort grows naturally in the *West-Indies*; this hath an herbaceous stalk two feet high; it is very woolly, closely armed on every side with slender, straight, yellow spines, which renders it very troublesome to handle. The leaves are very woolly on both sides, and cut on their edges; they are armed all over their surface on both sides with the like straight spines. The flowers come out in small loose bunches from the side of the stalks; they are large, of a pale blue colour, and have very woolly empalements; these are succeeded by berries the size of gray Peas, which are of a pale yellow colour when ripe.

The thirty-fifth sort is very common in the islands of the *West-Indies*, where it is titled Bachelors Pear; this has a prickly herbaceous stalk three or four feet high, dividing into a few branches, closely covered with a hairy down, and armed with short, recurved, brown spines. The leaves are divided into lobes, covered with soft hairs, and armed on both sides with crooked spines. The flowers come out from the side of the branches in small bunches; they are large, of a pale blue colour, and are succeeded by fruit about the size and shape of a Catherine Pear, but the stalk is fixed to the large end, so the fruit seems inverted. This is of a gold colour when ripe.

These are plants which require to be raised early in the spring upon a hot-bed, and should be treated in the same way as the fifteenth and sixteenth sorts.

The thirty-sixth sort was sent me from *New England*; this is an annual plant, with an upright herbaceous stalk two feet and a half high, having a smooth purple bark. The leaves have angular indentures, of a deep green co-

lour with purple veins. The flowers come out from the side of the stalks, sometimes singly, and at others there are three or four in a cluster; they are small, white within, and purple on their outside; these are succeeded by berries the size of common Cherries, which are red when ripe.

This is propagated by seeds, which should be sown upon a hot-bed in the spring, and when the plants come up fit to remove, they must be planted upon a fresh hot-bed to bring them forward, and afterward treated in the way as the Capsicums, planting them into a warm border in *June*, where they will flower in *August*, and if the season proves favourable, the seeds will ripen in autumn, soon after which the plants decay.

SOLDANELLA. *Tourn. Inst. R. H. 82. tab. 16.* Soldanel.

The Characters are,

The flower has an erect permanent empalement, cut into five parts; it has one bell-shaped petal. The brim is cut into acute segments; it has five awl-shaped stamina, terminated by single summits, and a roundish germen, supporting a slender style the length of the petal, which is permanent, crowned by an obtuse stigma. The germen afterward turns to an oblong taper capsule of one cell, obliquely streaked, opening at the top with ten indentures, filled with small acute-pointed seeds.

We have but one Species of this genus, viz.

SOLDANELLA. *Hort. Cliff. 49.* Soldanel.

This plant grows naturally on the *Alps*, and other mountains in *Germany*. The root is fibrous and perennial; the leaves are almost kidney-shaped, of a dark green colour, and stand upon long foot-stalks. Between these arise the foot-stalk of the flower, which is naked, about four inches long, sustaining at the top two small, open, bell-shaped flowers, whose brim is cut into many fine segments like a fringe; the most frequent colour of the flower is blue, but it is sometimes found with a snow-white flower. After the flower is past, the germen becomes an oval capsule, with the style coming out at the top, filled with very small acute-pointed seeds.

There is another variety of this, whose leaves are less round.

The best method to propagate these plants is by parting of their roots, because their seeds do not succeed, unless they are perfectly ripe, and well nourished; and this rarely happens in *England*. Nor do the seeds, which are brought from abroad, succeed, for they seldom grow unless they are sown soon after they are ripe.

The season for transplanting and parting these roots is in *September*, that they may have time to make good roots before winter; for if they are removed in the spring, they never flower very strong.

The soil in which these plants thrive best, is a strong, cool loam; they must have a shady situation, for if they are exposed to the sun, they will not live, nor will they thrive in a warm light soil. In dry weather these plants should be frequently watered, which will cause them to flower strongly, and make a good increase.

SOLIDAGO. *Lin. Gen. Plant. 859.* Golden-rod, or Woundwort.

The Characters are,

It has a compound flower made up of hermaphrodite florets, and female half florets inclosed in one oblong imbricated empalement. The hermaphrodite flowers, which compose the disk, are funnel-shaped, cut into five points at the brim; they have five very short hair-like stamina, terminated by cylindrical summits, and a crowned germen, supporting a slender style as long as the stamina, crowned by a bifid open stigma. The germen afterward turns to a single seed, crowned with hairy down. The female half florets are tongue shaped, indented in three parts; these have a crowned germen with a slender style, crowned by two revolving stigmas,

figmas, and are succeeded by a single seed like the hermaphrodite florets.

The Species are,

1. SOLIDAGO caule erecto angulato, racemis paniculatis erectis confertis, foliis inferioribus lanceolatis serratis. Golden-rod with an erect angular stalk, flowers in clusters upon upright panicles, and the lower leaves spear-shaped.
2. SOLIDAGO caule erecto paniculato, foliis infimis dentato-serratis caulinis sub-integerrimis. Golden-rod with an erect paniced stalk, the lower leaves indented like saws, but those on the stalks almost entire.
3. SOLIDAGO foliis caulinis lineari-lanceolatis subintegerrimis, floribus confertis alaribus sessilibus. Golden-rod with narrow spear-shaped leaves on the stalk almost entire, and flowers in clusters sitting close to the stalks.
4. SOLIDAGO foliis lineari-lanceolatis subserratis, incanis panicula corymbosa terminali. Flor. Angl. Welsh Golden-rod with narrow, spear-shaped, hoary leaves, and the stalk terminated by a corymbus of flowers.
5. SOLIDAGO caule erecto, foliis lanceolatis acute serratis caule corymboso. Golden-rod with an erect stalk, spear-shaped leaves sharply sawed, and flowers in a corymbus.
6. SOLIDAGO paniculato-corymbosa racemus recurvatis floribus adscendentibus, foliis trinerviis subserratis scabris. Hort. Upsal. 259. Golden-rod with a paniced corymbus, a recurved racemus, and rough sawed leaves with three veins.
7. SOLIDAGO foliis lanceolatis subserratis acuminatis, pedunculis lateralibus unifloris. Golden-rod with spear-shaped, sharp-pointed, sawed leaves, and lateral foot-stalks with one flower.
8. SOLIDAGO paniculato-corymbosa, racemis recurvatis, floribus adscendentibus, foliis enerviis subintegerrimis. Hort. Upsal. 259. Golden-rod with a paniced corymbus, a recurved racemus, and leaves almost entire, without veins.
9. SOLIDAGO paniculato-corymbosa, racemus recurvatis, floribus adscendentibus, foliis nervosis scabris integerrimis. Golden-rod with a paniced corymbus, a recurved racemus, and rough veined leaves.
10. SOLIDAGO caule flexuoso, foliis ovatis acuminatis serratis, racemis lateralibus simplicibus. Flor. Leyd. Prod. 161. Golden-rod with a flexible stalk, oval, sharp pointed, sawed leaves, and simple racemus on the sides of the stalk.
11. SOLIDAGO foliis linearibus integerrimis, corymbo simplici. Hort. Cliff. 410. Golden-rod with linear entire leaves, and a simple corymbus.
12. SOLIDAGO caule flexuosa, foliis ovato-lanceolatis serratis, racemis erectis corymbosis. Golden-rod with a flexible stalk, oval, spear-shaped, sawed leaves, and upright spikes of flowers.
13. SOLIDAGO caule erecto glabro, foliis ovato-lanceolatis serratis, racemis lateralibus simplicibus sessilibus. Golden-rod with an erect smooth stalk, oval, spear-shaped, sawed leaves, and simple spikes of flowers on the side of the stalk.
14. SOLIDAGO paniculato-corymbosa, racemis recurvatis, caule hirsuto, foliis lanceolatis serratis trinerviis subtus tomentosiss. Golden-rod with a paniced corymbus, recurved spikes of flowers, a hairy stalk, and spear-shaped sawed leaves, hoary on their under side.
15. SOLIDAGO paniculato-corymbosa, racemis recurvatis, floribus adscendentibus, foliis lanceolatis subdentatis sessilibus. Golden-rod with a paniced corymbus, recurved spikes of flowers, and spear-shaped indented leaves sitting close to the stalk.
16. SOLIDAGO foliis caulinis ovatis scabris, ramis alternis fastigiatis corymbis terminalibus. Lin. Sp. Plant. 878. Golden-rod with oval rough leaves on the stalk, alternate branches, and bundled spikes of flowers terminating the branches.
17. SOLIDAGO caule obliquo, pedunculis erectis foliatis ramosis, foliis lanceolatis integerrimis. Hort. Cliff. Golden-rod

with an oblique stalk, erect foot-stalks to the flowers, and entire spear-shaped leaves.

18. SOLIDAGO panicula erecta corymbosa, caule glabro, foliis longissimis integerrimis glabris. Golden-rod with an erect paniced corymbus, a smooth stalk, and very long, entire, smooth leaves.

19. SOLIDAGO foliis lanceolatis subcarnosis glaberrimis margine scabriusculis, panicula corymbosa. Lin. Sp. Plant. 878. Golden-rod with spear-shaped, fleshy, very smooth leaves, with rough edges, and a paniced corymbus of flowers.

20. SOLIDAGO caule diffuso glabro, foliis caulinis linearibus glabris sessilibus, racemis erectis simplicibus. Golden-rod with an erect smooth stalk, garnished with narrow smooth leaves sitting close, and simple erect spikes of flowers.

21. SOLIDAGO caule paniculato, racemis lateralibus simplicibus, foliis ovato-lanceolatis scabris integerrimis. Golden-rod with a paniced stalk, single lateral spikes of flowers, and rough, entire, spear-shaped leaves.

22. SOLIDAGO panicula corymbosa, racemis supra densifloribus, caule glabro laevi. Lin. Sp. Pl. 879. Golden-rod with a paniced corymbus, the upper part of the spikes closer set with flowers, and a smooth stalk.

23. SOLIDAGO panicula corymbosa, racemis recurvis adscendentibus, caule inferne ramoso floriferoque. Lin. Sp. Plant. 879. Golden-rod with a paniced corymbus, recurved spikes of flowers, and the lower part of the stalk branching and flowering.

24. SOLIDAGO caule paniculato, racemis confertis, foliis inferioribus lanceolatis, petiolatis caulinis sessilibus glabris. Golden-rod with a paniced stalk, clustered spikes of flowers, lower leaves spear-shaped upon foot-stalks, and those upon the stalks smooth, sitting close.

25. SOLIDAGO paniculato-corymbosa, racemis longissimis recurvatis, foliis lanceolatis scabris. Golden-rod with a paniced corymbus, very long recurved spikes of flowers, and rough spear-shaped leaves.

26. SOLIDAGO caule paniculato, pedunculis erectis, foliis linearibus glabris integerrimis sessilibus. Golden-rod with a paniced stalk, erect foot-stalks to the flowers, and smooth, narrow, entire leaves.

27. SOLIDAGO caule paniculato, racemis erectis, floribus confertis, foliis lanceolatis serratis scabris. Golden-rod with a paniced stalk, erect spikes with flowers in clusters, and spear-shaped, rough, sawed leaves.

28. SOLIDAGO caule paniculato, racemis sparsis, pedunculis erectis, foliis inferioribus lanceolatis serratis caulinis obtusis integerrimis sessilibus. Golden-rod with a paniced stalk, the spikes of flowers thinly disposed, the foot-stalks erect, the lower leaves spear-shaped and sawed, but those on the stalks obtuse, entire, sitting close.

The three first sorts grow naturally in *England*, yet have not been well distinguished by any botanick writer, for in all the books which treat of the *English* plants, they are put down as one sort, to which they have applied a title of *Caspar Bauhin*, viz. *Virga aurea latifolia serrata*, which is a very different plant from either of our *English* sorts. But the third sort here mentioned, I believe to be what *Caspar Bauhin* has titled *Virga aurea angustifolia minus serrata*. As neither of these three *English* sorts, nor the *Welsh* sort, are propagated in gardens, so it is needless to trouble the reader with their description.

The sixth sort was first brought from *Canada*, but has been since found growing naturally in many other parts of *North America*. The stalks of this rise three feet high, garnished with narrow, acute-pointed, entire leaves, a little rough on their surface, sitting close to the stalk, which is terminated by a close panice of yellow flowers, making a goodly appearance.

The seventh fort grows naturally on the *Alps*. The stalks seldom rise more than four or five inches high, garnished with small spear-shaped leaves, sitting close; and at their base the foot-stalk of the flower comes out, which is an inch long, sustaining one yellow flower at the top, so makes but little appearance. This is kept for variety in botanick gardens.

The eighth fort grows naturally in several parts of *North America*. The stalks of this rise higher than those of the sixth fort; the leaves are broader, without veins, and stand closer upon the stalks; the racemi of the panicles are much longer and more reflexed. The flowers are specious, and come later in the year.

The ninth fort has pretty strong smooth stalks about three feet high, closely garnished with rough, veined, entire leaves, without foot-stalks. The panicle of flowers is very compact, and the racemi are short.

The tenth fort has flexible stalks about two feet high, garnished with oval acute-pointed leaves, deeply sawed on their edges, standing on short foot-stalks. The racemi of flowers, which are for the most part simple, are produced from the wings of the stalk, which is also terminated by a thick spike.

The eleventh fort grows naturally in the south of *France* and in *Italy*. The stalks are near two feet high, garnished with narrow, spear-shaped, entire leaves; and most part of the stalk is adorned with flowers, standing on long foot-stalks, which proceed from the wings. The whole plant is very clammy, and seldom lives more than two or three years. It is propagated by seeds, and will thrive in the full ground, if it has a light dry soil and a sheltered situation.

The twelfth fort has a great resemblance of the tenth, but the leaves of the twelfth are smoother, more unequally sawed, and their foot-stalks are a little longer. The racemi of flowers are longer, and grow more erect than those of the tenth.

The thirteenth fort has smooth erect stalks three or four feet high, garnished with smooth, oval, spear-shaped leaves, sawed on their edges. The racemi of flowers are short, and come out on the side of the stalk.

The fourteenth fort has hairy stalks four feet high, closely garnished with long spear-shaped leaves, sawed on their edges, and downy on their under side. The stalks are terminated by a corymbus of flowers, composed of several reflexed racemi.

The fifteenth fort has rough hairy stalks two feet high, closely garnished with long spear-shaped leaves, a little indented on their edges; the stalks are terminated by a large corymbus of flowers, composed of many long reflexed racemi.

The sixteenth fort has rough channelled stalks from two to three feet high, garnished with large, rough, oval leaves, and are terminated by bunches of yellow flowers, forming almost an umbel. The bottom leaves of this fort are long and spear shaped, so differ much from those on the stalk.

The seventeenth fort was brought from *Mexico*, where it grows naturally. The stalks of this are smooth, one foot and a half high, garnished with smooth, spear-shaped, entire leaves: the flowers come out on one side of the stalk, forming a small corymbus at the end of the foot-stalk. This is not so hardy as the other sorts, so should be planted in a warmer situation.

The eighteenth fort has hairy stalks six or seven feet high, closely garnished with smooth spear-shaped leaves, sitting close, and terminated by a compact corymbus of flowers, ranged on short racemi. The lower leaves are very long and smooth.

The nineteenth fort rises with thick, succulent, smooth

stalks five feet high, garnished with fleshy, smooth, pear-shaped leaves, whose edges are rough; the flowers terminate the stalk in a corymbus; the racemi, which compose it, are erect, and below the flowers are closely garnished with linear smooth leaves. The lower leaves of this fort are very long, smooth, and fleshy.

The twentieth fort hath smooth diffused stalks three feet high, garnished with very narrow smooth leaves; the upper part sends out many long side branches, disposed closely, which are terminated by simple racemi of small yellow flowers, standing erect.

The twenty-first fort sends out many slender hairy stalks three feet high, garnished with oval, spear-shaped, rough leaves, which are entire. The upper part of the stalk sends out on each side single racemi of bright yellow flowers. This fort flowers very late in the year.

The twenty-second fort has slender smooth stalks, rising from two to three feet high, thinly garnished with smooth spear-shaped leaves, a little notched on their edges. The stalk is terminated by a paniced corymbus of yellow flowers, whose racemi are very closely adorned with flowers toward their ends.

The twenty-third fort sends out at the bottom large oval leaves, sawed on their edges, whose foot-stalks are bordered by the appendix of the leaf; the stalks are slender, stiff, and of a purplish colour, branching out in loose racemi of flowers, which are recurved, garnished with smooth, spear-shaped, entire leaves.

The twenty-fourth fort has smooth erect stalks two feet high, which are closely garnished with small, spear-shaped, smooth leaves, sitting close to the stalks, and are entire. The flowers terminate the stalk in a clustered corymbus, whose foot-stalks are erect. The lower leaves of this are long, spear-shaped, smooth, and have foot-stalks.

The twenty-fifth fort sends out strong smooth stalks two feet high, garnished with rough spear-shaped leaves, indented on their edges; the upper part of the stalk divides into many slender branches, which are garnished with very small leaves, and are terminated by recurved racemi of bright yellow flowers.

The twenty-sixth fort sends out smooth paniced stalks two feet high, garnished with linear, smooth, obtuse leaves, which are entire, and sit close the stalk. The flowers terminate the stalk in loose panicles, standing erect.

The twenty-seventh fort hath purplish stalks, which rise three feet high, and are closely garnished with rough spear-shaped leaves, slightly sawed on their edges, ending in acute points. The stalks are terminated by erect racemi of flowers, growing in clusters, of a bright yellow colour.

The twenty-eighth fort has smooth, pale, green stalks, which rise four feet high, and are thinly garnished with oblong, entire, smooth, blunt-pointed leaves, sitting very close. The lower leaves are large, spear-shaped, oblique, and sawed on their edges. The stalks are terminated by simple racemi, which are thinly disposed in a corymbus, but their foot-stalks are erect.

There are several other varieties (if not distinct species) of this genus; but it is very difficult to settle the specific differences of those now growing in the *English* gardens, for of late years there has been a great number of these and also of *Asters* raised from seeds, which have been sent from *North America*, from whence most of the sorts here mentioned originally came. But as the seeds have been gathered by persons little acquainted with the science of botany, so they have generally been sent mixed together, which, when sown, the plants have risen promiscuously.

So that in order to ascertain the species, their seeds should be saved very carefully and distinctly sown, to see if the plants arising from each do retain their difference.

These plants are hardy, so will thrive in almost any situation in this country; and as they flower in autumn, when there is a scarcity of other sorts, so they are proper furniture for large gardens; for they do most of them propagate and spread so much at their roots, as to require more room than can well be spared in small gardens. But as they do not require much care in their cultivation, so they are fit for wood-walks, and to intermix with shrubs, where, when they are properly disposed, they will be very ornamental.

Some of the sorts begin to flower in the middle of July, which are succeeded by others till the end of November; and in favourable seasons there are two or three sorts, which frequently continue in flower till Christmas, so that for near five months these plants will, in succession, adorn the garden.

They are easily propagated by parting of their roots; the best time for doing this is soon after the flowers decay; for those which are parted in the spring, will not be well established in the ground before they begin to put out their stalks, so will not flower strong, unless the summer is wet, or the plants are duly watered, which is difficult to perform in large plantations.

When the roots of these sorts are well fixed in the ground, they may remain five or six years without transplanting; for if the ground about them is dug every winter, and such of the sorts as spread much at their root are reduced so as to keep them within proper limits, they will require no other culture. But in five or six years it will be proper to take up the roots, because in that time the middle of the bunch of roots will begin to decay; so the offsets should be taken off for to plant, and the old decayed roots thrown away.

The plants may also be propagated by seed; but these should be sown soon after they are ripe, for then they will more certainly grow than if sown in the spring, and the plants will come up the following spring; whereas those which are sown in the spring, generally remain a year in the ground before the plants appear.

When the plants come up, and have strength enough to be removed, they may be planted in a shady border at six inches distance, where they should remain till the following autumn, when they should be transplanted to the places where they are designed to remain, and the summer following they will flower.

SONCHUS, Sowthistle.

These are many of them weeds in England, so are not planted in gardens; for if their seeds are once permitted to scatter upon the ground, they will soon stock it with plants; for which reason they should always be extirpated, not only those in the garden, but also those in the parts near it; because their seeds being furnished with down, are waisted in the air to a considerable distance, where falling on the ground, they soon come up, and prove troublesome weeds.

SOPHORA. Lin. Gen. Plant. 456.

The Characters are,

The flower hath a short bell-shaped empalement, cut at the brim into five obtuse segments. The flower is of the butterfly kind; the standard is oblong, broad, and reflexed on the sides. It has two oblong wings with appendages to their base; the keel is of two leaves, like those of the wings, whose lower borders join like the keel of a boat. It has ten distinct stamina, which are awl-shaped, parallel, and the length of the petals hid in the keel, terminated by small summits, and a taper oblong germen, supporting a style the length of the stamina, crowned by an obtuse stigma. The germen afterward turns to a long slender pod, with swellings where each seed is posited.

The Species are,

1. SOPHORA foliis pinnatis, foliolis numerosis villosis oblongis. Lin. Sp. Plant. 373. Sophora with winged leaves, having a great number of oblong hairy lobes.

2. SOPHORA foliis pinnatis, foliolis numerosis subrotundis.

Lin. Sp. Plant. 373. Sophora with winged leaves, composed of many roundish lobes.

3. SOPHORA foliis ternatis subsessilibus, foliolis subrotundis glabris. Lin. Sp. Plant. 373. Sophora with trifoliate leaves fitting almost close to the stalks, whose lobes are roundish and smooth.

The first sort grows naturally in the *Levant*; this has a perennial creeping root, from which arise several erect stalks from three to four feet high, garnished with winged leaves, composed of a great number of oblong hairy lobes, ranged by pairs along the midrib, terminated by an odd one. The flowers come out from the wings of the stalk in long spikes, which stand erect close to the stalk; they are of a pale blue colour, and small. These appear in July, but are rarely succeeded by pods in England.

It propagates fast enough by its creeping root, in the same manner as Liquorice, when the plant is once obtained, and is very hardy, so should be planted in some corner of the garden, at a distance from other plants, because the roots of this plant will spread, and mix with those of the neighbouring plants, and soon over-bear them. It will thrive in almost any soil or situation, for I have frequently seen the roots spread into the middle of gravel-walks, and send up stalks.

The second sort grows naturally in the island of *Ceylon*, and also in the *West-Indies*, but particularly at *Jamaica*, where the inhabitants call it Sea-side Pigeon Pea; this rises with a downy stalk to the height of six or seven feet, garnished with winged leaves, composed of five or six pair of roundish woolly lobes, terminated by an odd one. The flowers come out in short loose spikes from the wings of the stalks; they are large and yellow, not much unlike those of *Spanish Broom*, but have no scent; these are succeeded by taper woolly pods five or six inches long, having four or five large swellings, in each of which is contained one roundish brown seed as large as Peas.

This plant is tender, so will not thrive in England out of a stove; it is propagated by seeds, which may be easily procured from the *West-Indies*, for the plants do not perfect them in England; these should be sown in pots, and plunged into a good hot-bed, where, if the seeds are good, the plants will appear in a month or six weeks. When these are fit to remove, they should be each transplanted into a separate pot, and plunged again into a hot bed of tanners bark, observing to shade them from the sun, till they have taken new root; after which they must be treated in the same way as other tender plants from the same countries, always keeping them in the bark-bed in the stove, and in the winter they should have but little water.

The third sort grows naturally in *Virginia* and *Philadelphia*; from both these places I have received the seeds; from this plant there was formerly a coarse sort of Indigo made in *America*, as there was from some other plants, before the true Indigo plants were introduced there: this has a perennial root, from which arise several stalks about a foot high, sending out from the bottom a great number of small branches, garnished with leaves, composed of three oval smooth lobes, joined together at the foot-stalk like other trifoliate leaves; they fit close to the branches. The flowers come out toward the end of the branches in short spikes; they are of the butterfly kind, yellow, and appear in July; they are often succeeded by short swelling pods, which in warm seasons come to maturity in England. The stalks of this decay to the root in autumn.

This is propagated by seeds, which should be sown on a warm border the beginning of April. The best way is to sow them in shallow drills for the more conveniently keeping the plants clean, for they must not be removed till the stalks decay in autumn, when they should be carefully taken

taken up, and planted in a warm border, where they are designed to remain.

SORBUS. *Tourn. Inst. R. H. 633.* The Service-tree.

The Characters are,

The flower has a spreading, concave, permanent empalement, indented in five parts; it has five roundish concave petals, which are inserted in the empalement, and about twenty awl shaped stamina, which are also inserted in the empalement, terminated by roundish summits. The germen is situated under the flower, supporting three slender styles, crowned by erect beaded stigmas; it afterward becomes a soft umbilicated fruit, inclosing three or four oblong cartilaginous seeds.

The Species are,

1. SORBUS *foliis pinnatis, utrinque glabris.* Hall. *Helv.* 250. Service-tree with winged leaves, which are smooth on both sides; called Quickbeam, Mountain Ash, and in the north Roan-tree.

2. SORBUS *foliis pinnatis, subtus tomentosus.* Hall. *Helv.* 351. Service-tree with winged leaves, which are woolly on their under side; the cultivated Service.

The first sort grows naturally in many parts of *England*, but in the southern counties they are seldom seen of any great magnitude, for the trees are commonly cut down, and reduced to underwood; but in the north of *England* and *Wales*, where they are permitted to grow, there are trees of a very large size. The stems are covered with a smooth gray bark; the branches while young have a purplish brown bark; the leaves are winged; they are composed of eight or nine pair of long narrow lobes, terminated by an odd one; they are sharply sawed on their edges; the leaves on the young trees in the spring are hoary on their under side, which about *Midsummer* goes off, and those upon the older branches have very little at any season. The flowers are produced in large bunches almost in form of umbels at the end of the branches; they are composed of five spreading concave petals, shaped like those of the Pear-tree, but smaller; these appear in *May*, and are succeeded by roundish berries, growing in large bunches, which have a depressed navel on the top, and turn red in autumn when they ripen.

This tree is cultivated in the nursery-gardens, and sold as a flowering shrub; if they were permitted to grow, they would rise to a great height, and have large stems. The leaves of this tree make a pretty variety when they are mixed with others, during the time of their flowering, and also in autumn. When their fruit is ripe, they make a pretty appearance, but the blackbirds and thrushes are so fond of this fruit, as to devour it as soon as it ripens; so that in those places where there is a plenty of these birds, there will not be any of the fruit left to be perfectly ripe; however, as it is good food for these songsters, where people have a desire of drawing a number of these birds about their habitations, they should plant a quantity of these trees for that purpose.

The second sort grows naturally in the warmer parts of *Europe*, where it rises to a great height, and becomes a large tree, but in *England* there are few of any large size. In the south of *France* and in *Italy*, the fruit is served up to the table in their deserts, but in *England* they have not been much esteemed, which has occasioned their being so little cultivated here. There are several varieties of this fruit, which differ from each other in size and shape, as Apples and Pears do; some of these are shaped like Catherine Pears, and are nearly as large; others are depressed at both ends, and shaped like Apples; but both these sorts will arise from seeds of the same tree, so that those, who are desirous of having the largest and best kinds, should propagate them by grafting or budding from those trees whose fruit are the fairest and best flavoured, as is practised for other fruits; these may be grafted or budded upon Pear-

stocks, which agree better with this tree than any other except their own, for they will not take upon Apple-stocks, nor do they thrive upon the Hawthorn or Medlar near so well, though the fruit of this tree approaches nearer to those than any other, and are not fit for the table till they are in a state of decay.

The several varieties of this tree differ in the number of their seeds, in the same manner as Pears, Apples, Quinces, and Medlars, some of them having but three seeds in each fruit, and others have four or five; so that, although one of the characters of this genus is, that the fruit has but three seeds, yet that must be understood to be of the wild sort, in which there are seldom more, but those of the cultivated kind are as uncertain as the fruit of Apples and Pears.

In *Italy* these trees are very common, where they have a great variety of sorts, which have been obtained from seeds; but I have not observed in the *English* gardens more than three, and those are yet but scarce, for there are at present but few large trees of the true Service in *England*, one of which was lately growing in the gardens formerly belonging to *John Tradescant* at *South-Lambeth*, near *Vauxhall* in *Surry*, who was a very curious collector of rare plants in king *Charles* the Second's time; which tree was near forty feet high, and produced a great quantity of fruit annually, which were shaped like Pears; and there are indeed some trees of middling growth in the gardens of *Henry Marsh*, Esq; at *Hammer-smith*, which produce fruit of the Apple shape (from whence several young plants have been raised of late in the nurseries near *London*); but these are small, compared to that in *John Tradescant's* garden.

There are great numbers of large trees of this Service growing wild about *Aubigny* in *France*, from whence his grace the late duke of *Richmond* brought a great quantity of the fruit, and from the seeds raised a great number of young plants in his garden at *Goodwood* in *Suffex*.

The leaves of this tree differ from those of the first, in their lobes being broader, and not so much sawed; they are also much more downy on their under side, and the young shoots of the tree are covered with a white down. The flowers are produced in larger and more diffused bunches, and are a little larger; but there are seldom more than two or three fruit produced upon each bunch. The stamina of the flowers are also longer than those of the wild sort, which are the only differences I can observe between them.

Both these sorts may be propagated by sowing their seeds in pots soon after the fruit is ripe, sheltering them under a common frame in winter, and plunging the pots into a moderate hot-bed in the spring, which will soon bring up the plants; when they are come up, they should be carefully kept clear from weeds, and in dry weather watered; but they should be soon exposed to the open air, for the only reason of putting them in a hot-bed, is to forward the growth of the seeds; but if, when the plants are come up, the bed is kept covered, it will draw the plants, and spoil them. In this bed the plants should remain until the middle of *October*, at which time their leaves will decay, when there should be a warm light spot of ground prepared to receive them, into which they should be planted in rows two feet asunder, and a foot distant in the rows, observing to take them up carefully, and to plant them as soon as possible, that their roots may not dry.

During the summer, the ground should be kept constantly clear from weeds, and in winter there should be a little mulch laid upon the surface of the ground about their roots, to protect them from being injured by frost, but in the spring the ground between them should be dug, burying the mulch therein; in doing of which you

must be careful not to cut or injure the roots of the plants.

In this nursery they may continue three or four years, according to their growth, when it will be proper to transplant them out where they are to remain; the best season for which is in *October*, or in the spring, just before they begin to shoot. The soil should be warm in which they are planted, and the situation defended from cold winds, in which place they will thrive, and produce fruit in a few years.

Those who raise many of these trees from seeds, will procure some varieties of the fruit, from which the best may be selected, and propagated for the table, and the others may be planted for variety in wildernesses or wood-walks, or may be used for stocks to graft the better kinds upon.

The wood of the wild Service-tree is much commended by the wheelwright for being all heart; and it is of great use for husbandmens tools, goads, &c. It is very white and smooth, so will polish pretty well.

There is a sort of this with variegated leaves, which is preserved by such as are curious in collecting the several sorts of striped plants, but there is no great beauty in it; it may be propagated by layers, or by being budded on the plain sort; but they become plain on a very rich soil.

These trees should have a moist strong soil, but will grow in the most exposed places, being extremely hardy, which renders them worthy of care, since they will thrive where few other trees will succeed.

SORREL. See *Acetosa*.

SOUTHERNWOOD. See *Abrotanum*.

SOWBREAD. See *Cyclamen*.

SPARTIUM. *Lin. Gen. Plant.* 765. The Broom-tree.

The Characters are,

The empalement of the flower is heart-shaped. The flower is of the butterfly kind; the standard is almost heart-shaped, large, and wholly reflexed; the wings are oblong, shorter than the standard, and annexed to the stamina; the keel is oblong, longer than the wings; the borders are hairy, and connected together, to which the stamina are inserted. It has ten unequal stamina, nine of which are joined together, and the under stands apart, with an oblong hairy germen, supporting a rising awl-shaped style, to which is fastened an oblong, hairy, inflexed stigma. The germen afterward becomes a long cylindrical obtuse pod, of one cell, opening with two valves, including several globular kidney shaped seeds.

The Species are,

1. SPARTIUM ramis oppositis teretibus apice floriferis, foliis lanceolatis. *Hort. Cliff.* 356. Commonly called Spanish Broom.

2. SPARTIUM ramis oppositis angulatis, foliis oppositis subulatis. *Lin. Sp. Plant.* 708. Radiated or starry Broom.

3. SPARTIUM ramis angulatis, racemis lateralibus, foliis lanceolatis. *Hort. Cliff.* 356. Broom with angular branches, flowers in bunches from the side, and spear-shaped leaves.

4. SPARTIUM ramis subteretibus, racemis lateralibus, foliis lineari-lanceolatis. Commonly called white Spanish Broom.

5. SPARTIUM foliis ternatis solitariisque, ramis inermibus angulosis. *Hort. Cliff.* 356. Common green Broom with a yellow flower.

6. SPARTIUM foliis ternatis, foliolis cuneiformibus, ramis inermibus angulatis. Portugal Broom with a large flower.

7. SPARTIUM foliis ternatis petiolatis, foliolis lineari-lanceolatis bisectis, ramis inermibus angulatis. Broom with trifoliolate leaves upon foot-stalks, linear spear-shaped lobes, which are hairy, and angular armed branches.

8. SPARTIUM foliis ternatis glabris sessilibus, ramis inermibus angulatis, leguminibus glabris. Broom with trifoliolate smooth leaves sitting close to the branches, which are angular and unarmed, and smooth pods.

9. SPARTIUM foliis solitariis ternatisque, ramis sexangula-

ribus apice floriferis. *Lin. Sp. Plant.* 709. Eastern Broom with round, smooth, compressed pods.

10. SPARTIUM foliis ternatis, ramis angulatis spinosis. *Hort. Cliff.* 356. Broom with trifoliolate leaves, and angular prickly branches; commonly called prickly Cytifus.

11. SPARTIUM caule arborecente ramofo aculeato, foliis cuneiformibus confertis, floribus solitariis alaribus. Prickly Broom with Purslain leaves; or Ebony of the *West-Indies*.

The first sort is the common Spanish Broom, which has been long cultivated in the English gardens for the sweetness of its flowers: of this there are two varieties, if not distinct species, which grow naturally in Spain and Portugal. The first, which is the common sort in England, has larger branches, and broader leaves than the other. The flowers are also larger, of a deeper yellow colour, and appear earlier than those of the other, which has been of late years introduced from Portugal.

Both these sorts have smooth flexible branches, which rise eight or ten feet high. The lower part of the branches are garnished with small, spear-shaped, smooth leaves; the flowers are disposed in a loose spike, terminating the branches; they are large, yellow, of the butterfly kind, have a strong agreeable odour, appear in July, and in cool seasons there is frequently a succession of flowers till September, which are succeeded by compressed pods, containing one row of kidney-shaped seeds, which ripen in autumn.

These plants are easily propagated by seeds, which should be sown in the spring upon a bed of common earth in a shady situation, where the plants will rise very freely; these must be kept clean from weeds the following summer, and in autumn they may be taken up and transplanted in a nursery, which should be chosen in a warm sheltered situation. In the taking up of the plants, there should be care taken not to tear the roots, for these send their roots deep into the ground, and are very apt to be torn if they are not raised out of the ground with a spade; they should be planted in rows three feet asunder, and at one foot distance in the rows. In this nursery they may remain a year or two to get strength, and then may be planted where they are to remain, for they do not succeed if they are removed large.

If the seeds of these sorts are permitted to scatter in autumn, the plants will come up in plenty in the spring without care, which may be transplanted the following autumn, and treated in the same way as those before mentioned. These shrubs are very ornamental to large wood-walks in gardens, but hares and rabbits are very fond of them; so that, unless they are screened from these animals, they will devour them in winter when they have a scarcity of other food.

The second sort grows naturally in India; this is a shrub of low growth, seldom rising more than three feet high, but divides into many spreading branches, so as to form a large bush. The branches are small, angular, and come out opposite; the leaves are very narrow, awl-shaped, and are placed round the stalk, spreading out like the points of a star; the flowers are disposed in small clusters at the end of the branches; they are yellow, but not more than half the size of those of the former, and have no scent; they are succeeded by short hairy pods, containing two or three small kidney-shaped seeds in each. This shrub makes a pretty appearance during the time of its continuing in flower, and, as it is hardy, deserves a place in gardens.

It is propagated by seeds, which should be sown in autumn, for those which are sown in the spring, seldom grow the same year; these may be sown in a bed of common earth in rows, for the more conveniently keeping the plants clean from weeds. The plants should remain in the seed-bed till the following autumn, when they may be either trans-

transplanted to the places where they are to remain, or in a nursery to grow a year or two to get strength, before they are planted out for good; but these plants will not bear transplanting when they are large, so should be removed while they are young.

The third sort rises with slender flexible stalks six or seven feet high, sending out slender Rush-like branches, which are angular, and toward the bottom are garnished with a few small spear-shaped leaves. The flowers are produced in small bunches, which come out from the side of the branches; they are very small, of the butterfly kind, and of a deep yellow colour; these are succeeded by short, oval, swelling pods, containing one large kidney-shaped seed; but unless the season is warm, the seeds do not ripen in *England*.

The fourth sort has a thick stalk, covered with a rugged bark when old; it rises eight or nine feet high, sending out many slender Rush-like branches of a silvery colour, almost taper, which have a few narrow spear-shaped leaves. The flowers are produced in very short spikes or clusters on the side of the branches; they are small, white, and are succeeded by large oval pods, containing one kidney-shaped seed.

These two sorts grow plentifully in *Spain* and *Portugal*, from both which countries the seeds may be easily procured. The seeds should be sown in the middle of *April* upon a bed of fresh light earth; but the best way will be to sow them in drills about half an inch deep. The drills should not be less than one foot asunder, and the seeds may be laid in the drills at about three inches distance, which will allow room for the plants to grow the first summer, for it will not be safe to remove them till the spring following. Although I have here directed the sowing of these seeds in *April*, yet it must be understood, if the season proves favourable, otherwise it will be better to defer it longer, for these seeds are as subject to perish in the ground by cold or wet, as are the Kidney-beans; therefore, when the season is favourable for sowing them, the seeds of the Broom may be safely sown.

But at *Michaëmas* some of the plants of each kind may be taken up and potted, to be sheltered in winter, for while they are young, they are in danger of suffering by frost; so these should be placed under a common hot-bed frame, to screen them from cold, but in mild weather they must be exposed daily to the open air.

Those plants which are left in the seed-bed, may be sheltered with mats, and some mulch laid about their roots to prevent the frost penetrating the ground; in the spring these may be transplanted in a warm situation, where they will do very well; but it is always necessary to have a plant or two of each sort in pots, that they may be sheltered in winter to preserve the sorts.

The fifth sort is the common Broom, which grows naturally in *England*, so is not often admitted into gardens, though, when it is in flower, it makes a much better appearance than many others which are costly; this rises with a flexible stalk four or five feet high, sending out many Rush-like angular branches. The lower part of the branches are garnished with trifoliate leaves, but upward they are single. The flowers come out upon short foot-stalks singly on the side of the branches toward the top; these are large, of the butterfly kind, and of a bright yellow colour. The flowers and branches of this sort are used in medicine.

The sixth sort grows naturally in *Portugal* and *Spain*; this has stronger stalks than our common Broom. The branches grow more erect, and have deeper angles; the leaves are all trifoliate, and much larger than those of the fifth, and the lobes are wedge-shaped; the flowers are lar-

ger, of a deeper yellow colour, and have longer foot-stalks. This is not so hardy as the last.

The seventh sort grows naturally in *Portugal*; this rises with a strong stalk like the former. The branches are angular, and grow erect; they are better furnished with leaves than either of the other sorts, which stand upon pretty long foot-stalks; the lobes are small, very narrow, and hairy; the flowers grow closer together, are larger, and of a deep yellow colour.

The eighth sort was brought from *Portugal*. The stalks and branches of this are slender, angular, and smooth, and are fully garnished with very narrow, trifoliate, smooth leaves, fitting close to the stalks. The flowers come out in long loose spikes at the end of the branches; they are large, of a bright yellow colour, and are succeeded by short compressed pods, which are smooth, containing small kidney-shaped seeds. This is by *Tournefort* made a *Cytisus*.

The ninth sort grows naturally in the *Levant*; this has slender stalks and branches, garnished with a few trifoliate and single leaves toward the bottom. The branches have six angles or furrows; the flowers are small, of a pale yellow colour, and are produced in loose spikes at the end of the branches, but are rarely succeeded by seeds in *England*.

The tenth sort grows naturally in *Italy* and *Spain* near the sea coast. The stalks rise five or six feet high, sending out many angular flexible branches, armed with long spines, upon which grow trifoliate leaves; the flowers are produced at the end of the branches in clusters, each standing upon a long foot-stalk; they are of a bright yellow colour, and are succeeded by short ligneous pods, with a thick border on their upper edges, containing three or four kidney-shaped seeds. This plant will not live abroad in *England*, unless it has a very warm situation.

These plants are raised from seeds in the same way as the first sort, and may be treated in the same manner.

The eleventh sort is very common in *Jamaica*, and several other places in the *West-Indies*, where the wood is cut, and sent to *England* under the title of Ebony, though it is not the true Ebony, which is a native of the eastern country, and is a plant of a very different genus. The wood of this *American* Ebony is of a fine greenish brown colour, and polishes very well, so is much coveted by the instrument makers, and is used for several purposes, being of a very hard durable nature.

This tree has a pretty thick stem, which rises twelve or fourteen feet high, covered with a rugged brown bark, dividing into spreading branches, which grow almost horizontal, and are armed with short, brown, crooked spines. The leaves are small, stiff, and wedge-shaped, coming out in clusters, and sit close to the branches. The flowers come out upon slender foot-stalks from the side of the branches singly; they are of the butterfly kind, of a bright yellow colour, and are succeeded by compressed moon-shaped pods, which inclose one kidney-shaped seed.

This plant is propagated by seeds, which must be procured from the countries of its natural growth. These should be sown in pots, filled with light fresh earth, early in the spring, and plunged into a good hot-bed of tanners bark. In about six weeks after the plants will appear, when they must be carefully treated (being very tender while young); they must have fresh air admitted to them every day, when the weather is warm, and should be frequently refreshed with water, when the earth in the pots appears dry. In about five or six weeks after the plants appear, they will be fit to transplant, when they should be carefully shaken out of the pots, and separated, planting each into a small pot, and plunged into the hot-bed again, being careful to shade them from the sun every day until they have taken root; after which time they must be treated

in the same manner as other tender exotick plants, by giving them air every day in warm weather, and watering them once in two or three days gently, and when the nights are cold, to cover the glasses. In this hot-bed the plants may remain till autumn, when they must be removed into the stove, and plunged into the bark-bed. Those of them whose roots have filled the pots, should be carefully shifted into pots one size larger, before they are plunged; but as these plants are not of quick growth while young, they do not require to be often shifted out of the pots. During the winter season these plants must be kept warm (especially the first year), and must have but little water; and in cold weather it must be given to them in small quantities. As these plants are very tender, they will not live in the open air in this country, even in the warmest part of the year; therefore they must be constantly kept in the stove, and should be plunged in the bark-bed, observing in the summer season, when the weather is warm, to admit a large share of fresh air to the plants. With this management the plants will thrive very well, and in a few years will produce their flowers, when they will make a pretty appearance in the stove.

SPERGULA. *Dillen. Gen. Nov. 7. Lin. Gen. Plant. 519.* Spurrey.

The Characters are,

The flower has a spreading permanent empalement. It has five oval, concave, spreading petals, which are larger than the empalement, and ten awl-shaped stamina shorter than the petals, terminated by roundish summits. It has an oval germen, supporting five slender, erect, reflexed styles, crowned by thick stigmas. The germen afterward turns to an oval close capsule with one cell, opening with five valves, inclosing many depressed, globular, bordered seeds.

The Species are,

1. SPERGULA *foliis verticillatis, floribus decandris. Hort. Cliff. 173.* Spurrey with leaves in whorls, and flowers with ten stamina.

2. SPERGULA *foliis verticillatis, floribus pentandris. Lin. Sp. Plant. 440.* Spurrey with whorled leaves, and flowers with five stamina.

3. SPERGULA *foliis oppositis subulatis lævibus, caulibus simplicibus. Lin. Sp. Plant. 440.* Spurrey with awl-shaped smooth leaves placed opposite, and single stalks.

There are some other species of this genus, which grow naturally as weeds in England, so are not worthy notice here; nor should I have mentioned these, were they not sometimes cultivated.

The first and second sorts are cultivated in Holland and Flanders for feeding their cattle; the usual time of sowing the seed is in July or August, that the plants may acquire strength before the winter's cold. The use that is made of this is to feed sheep, and other cattle, in winter and spring, when the common Grass fails. This plant seldom rises above six inches high, so will not afford a very great quantity of food; but as it will grow on the poorest land, it may be cultivated in many places to good advantage, where no other Grass will thrive so well, and by feeding it off the ground, the dung of the cattle will improve the land. This pasture, it is affirmed, will make excellent butter, and the mutton fed on it is said to be well tasted, so is by many preferred to that fed on Turneps. Hens will greedily eat this herb, and it makes them lay more eggs.

This plant being annual, must be sown every year; and whoever is willing to save the seeds, should sow it in April, that the plants may flower the beginning of July, and the seeds will ripen in August; when it must be cut before the heads are quite brown, otherwise the seeds will soon scatter.

The seeds being very small, about twelve pounds will be sufficient to sow an acre of land. The ground should be well harrowed before the seeds are sown, for if the larger clods are not broken, there will be an uneven crop of Grass. People in the low country sow this seed after a crop of Corn is taken off the land. The second sort is now much cultivated in Flanders, though it is a much lower plant than the common sort; but they esteem it a much better Grass. The seeds of this kind are smaller and flatter than those of the common sort, and have a white border round each.

SPERMACOCE. *Dill. Hort. Elth. 277. Lin. Gen. Plant. 111.* Button-weed.

The Characters are,

The flower has a permanent empalement, indented in four parts, sitting on the germen. It has one cylindrical petal, whose tube is longer than the empalement, and the brim indented in four parts. It has four awl-shaped stamina shorter than the petal, terminated by single summits; and a roundish compressed germen, situated under the flower, supporting a single style, divided in two parts at the top, crowned by obtuse stigmas. The germen afterward turns to two oblong seeds, which are joined, having two horns, and are convexed on one side, and plain on the other.

The Species are,

1. SPERMACOCE *glabro, staminibus inclusis. Lin. Sp. Plant. 102.* Smooth Spermacocce with stamina included in the flower.

2. SPERMACOCE *glabra, staminibus extantibus. Lin. Sp. Plant. 102.* Smooth Spermacocce with stamina standing out of the flowers.

The first sort grows to the height of two feet and a half; the stalks are stiff, a little angular, and covered with a brown bark; the branches and leaves come out by pairs; the leaves are smooth, and have one strong vein or midrib. The flowers grow in slender whorls toward the top of the stalks; they are small, white, and sit close to the stalks, having a whorl of small leaves close under them; these are succeeded by two oblong seeds, having small horns, which ripen in the empalement.

The second sort rises with a shrubby stalk three or four feet high, sending out a few slender branches, which are garnished with narrow leaves not so long as those of the former; they are smooth, of a light green, and stand in a kind of whorls round the stalk. The flowers grow in thick globular whorls toward the top of the stalk, one of which terminates the stalk; they are small, very white, and funnel-shaped. The brim is cut into four obtuse segments, which spread open, and the stamina stand out above the tube of the flower. After the flowers are past, the germen turns to two seeds, shaped like those of the former sort.

These plants grow naturally in moist places in Jamaica; the inhabitants call the second sort Button-weed. They are both propagated by seeds, which must be sown upon a hot-bed; and when the plants come up, they must be transplanted on a fresh hot-bed to bring them forward, and afterward treated in the same way as other tender plants, and, if they are placed in a stove, they will live through the winter, and produce good seeds the following year.

SPHÆRANTHUS. *Vaill. Aët. Par. 1719.* Globe-flower.

The Characters are,

The flowers are composed of hermaphrodite florets, and female half florets, which are included in one globular scaly empalement, garnished with them on every side the receptacle. There are several of these florets included in each partial empalement. The hermaphrodite florets are placed in the center; they are funnel shaped, and cut into five parts at the brim, having five very short hair-like stamina, terminated by cylindrical summits, and a germen supporting a thick style, having a single stigma; these are barren. The female half florets are situated round the border, and have scarce any petals,

but

but an oblong germen supporting a bristly style, crowned by a double stigma; these have one oblong naked seed.

The Species are,

1. SPHÆRANTHUS *pedunculis lateralibus unifloris*. Globe-flower with foot-stalks on the side with one flower.
2. SPHÆRANTHUS *pedunculis ramosis terminalibus*. Globe-flower with branching foot-stalks terminating the branches.

The first sort grows naturally in *India*; this rises with an herbaceous stalk about a foot high, which rarely branches out, garnished with spear-shaped leaves, whose base fits close to the stalk, and from them is extended a leafy border or wing along the stalk; they are sawed on their edges, and are of a deep green, standing alternate. The foot-stalks of the flowers come out from the side of the stalk, opposite to the leaf; they are about two inches long, and sustain one globular head of flowers at the top, of a purplish red colour; these are succeeded by oblong seeds, situated on the margin, which are naked.

The second sort grows naturally at *Madras*, and also at *La Vera Cruz*, in *New Spain*, where it was discovered by the late Dr. *Houssoun*. This rises with an herbaceous winged stalk about ten inches high, garnished with oval, spear-shaped, sawed leaves, placed alternately. The upper part of the stalk branches out into small divisions, which are terminated by foot stalks, sustaining three or four globular flowers, of a pale yellow colour.

These are both annual plants, which require a hot bed to bring them forward in the spring; and if the summer proves cold, they must be kept in a glass case, otherwise they will not ripen seeds here.

SPHONDYLIIUM. *Tourn. Inst. R. H. 219. tab. 170.* Cow Parsnep.

The Characters are,

It has an umbellated flower. The principal umbel is composed of many smaller, which are flat; the involucre of the general umbel has many leaves which decay; the particular ones have from three to seven leaves; the general umbel is difformed. The flowers in the middle or disk have five equal, crooked, inflexed petals. Those of the rays are unequal. They have five stamina, which are longer than the petals, terminated by small summits, and an oval germen, situated under the flower, supporting two short styles, crowned by single stigmas. The germen afterward turns to an elliptical compressed fruit, furrowed on each side, containing two compressed leafy seeds.

The Species are,

1. SPHONDYLIIUM *foliolis latioribus pinnatifidis, radiis umbellis maximarum*. Common hairy Cow Parsnep.
2. SPHONDYLIIUM *foliolis angustioribus pinnatifidis serratis, radiis umbellarum minoribus*. Hairy Cow Parsnep with narrower leaves.
3. SPHONDYLIIUM *foliolis pinnatifidis obtusis, petiolis bipidis, radiis umbellarum inæqualibus*. Greatest eastern Cow Parsnep.
4. SPHONDYLIIUM *foliis pinnatis utrinque scabris, floribus radiatis*. Small Alpine Cow Parsnep.
5. SPHONDYLIIUM *foliis simplicibus glabris floribus radiatis*. Smooth Alpine Cow Parsnep.

The first sort grows naturally by the side of brooks, ditches, and in moist meadows in many parts of *England*. The root of this plant is taper, fleshy, and shoots deep in the ground. The lower leaves are large and winged, composed of three pair of large lobes, placed along the midrib, terminated by an odd one; the lobes are also cut into two or three pair of wings almost to the midrib, terminated by an odd one. The foot-stalks of the leaves are very hairy; the leaves are of a deep green on their upper side, but are pale on their under, and are rough to the touch; the stalks are garnished at each joint with one leaf, of the same shape with those at bottom, but smaller, whose base embrace the

stalks. The flowers terminate the stalks in large umbels, which are composed of about twenty-two partial umbels, every third having longer foot-stalks than the others. The partial umbels have many large flowers, which are barren, and compose the rays; those of the disk or middle are smaller and fruitful, and are each succeeded by two flat bordered seeds.

The second sort grows naturally in moist meadows near *Battersea* in *Surry*, and in other parts of *England*; this has been supposed only a feminal variety of the first, but I have cultivated it in the garden near thirty years, and have always found the plants which were raised from seeds, kept their difference. The leaves of this sort are composed of two or three pair of narrow lobes, terminated by an odd one; the wings of the lobes are very narrow, acute-pointed, and are cut almost to the midrib; they are hairy, and of a lighter green than those of the former; the umbels are much smaller, as are also the flowers and seeds, in which it greatly differs from the former.

The third sort grows naturally in the *Levant*, and also in *Siberia*. The leaves of this are very broad; their foot-stalks are armed with prickly hairs, and are deeply channelled on their upper side; they are composed of two or three pair of very broad, smooth, obtuse lobes, terminated by an odd one, of a yellowish green colour. The stalks rise eight or ten feet high; they are channelled, and sustain umbels of flowers at the top, which are smaller than those of either of the two former sorts, and the flowers are yellow.

The fourth sort grows naturally on the *Alps*. The stalks of this do not rise more than one foot and a half high; the leaves are divided to the midrib; the lobes are a little cut on their edges, are of a deep green, and rough on both sides; the umbels of flowers are small and white.

The fifth sort grows naturally on the *Alps* and *Apennines*. The stalks of this rise almost three feet high; the leaves of this are smooth, divided into three lobes, but not very deep, and are indented about the edges. The stalks are terminated by small umbels of white flowers, which are succeeded by small, compressed, bordered seeds.

These are all very hardy plants, which may be propagated by seeds; the best time for sowing them is in autumn, soon after they are ripe. They should be sown where the plants are designed to remain, because they send forth tap-roots somewhat like those of the Parsnep, therefore do not thrive so well when transplanted, as if suffered to remain where they are sown. The plants grow very large, therefore the seeds should be sown in drills, at two feet and a half, or three feet distance; and in the spring, when the plants appear, they should be thinned, so as to leave them at least eighteen inches asunder in the rows; after which they will require no farther care, but to keep them clear from weeds; and when the plants have obtained strength, they will not easily be injured by weeds, for they will overbear them, and prevent their getting up. The second year these plants will produce flowers and seeds, and their roots soon after die; if their seeds are permitted to scatter, they will fill the neighbouring ground, and become troublesome weeds.

SPIGELIA. *Lin. Gen. Plant. 192.* Arapabaca. *Plum. Nov. Gen. 10. tab. 31.* Worm-grass.

The Characters are,

The flower has a permanent empalement of one leaf, which is cut into five acute points; it has one funnel-shaped petal, whose tube is longer than the empalement, cut into five points at the brim, which spread open. It has five stamina, terminated by single summits, and a germen, composed of two globular lobes, supporting one awl-shaped style the length of the tube, crowned by a single stigma. The germen afterward becomes two globular seed-vessels, which are joined, sitting in the empalement.

The Species are,

1. SPIGELIA *caule erecto, foliis quaternis sessilibus, spicis terminalibus.* Worm-seed with an erect stalk, and leaves growing by fours sitting close to the stalks, which are terminated by spikes of flowers.

2. SPIGELIA *foliis oppositis ovato-oblongis acuminatis sessilibus, spicis terminalibus.* Worm-grass with oblong acute-pointed leaves growing opposite, sitting close to the stalks, which are terminated by spikes of flowers.

The first sort grows naturally in moist places in most of the islands of the *West-Indies*. It is an annual plant with a fibrous root, from which arises a strong, erect, herbaceous stalk near a foot and a half high, which is channelled, and sends out two side branches opposite near the bottom, and a little above the middle is garnished with four oblong, oval, acute-pointed leaves, placed in form of a cross round the stalk; and at the same joint comes out two small side branches opposite; these, and also the principal stalk, have four smaller leaves near the top, sitting round in the same manner as the other; and from these arise short spikes of herbaceous flowers, ranged on one side the foot-stalk. These are succeeded by roundish twin capsules, which contain the seeds.

This plant is esteemed the most efficacious medicine for the worms yet known, and has been long used by the inhabitants of the *Brazils* as such, and also by the negroes, who taught the inhabitants of the *British* islands in *America* the use of it, where it has had great success; and from thence had the appellation of Worm-grass given to it.

It is too tender to thrive in the open air in *England*, so the seeds should be sown in pots, filled with soft loamy earth in the autumn, and plunged into the bark-bed in the stove, where they should remain till the spring, when they should be plunged into a fresh hot-bed, which will bring up the plants; these must be afterward planted into separate pots, and plunged into another hot-bed, and shaded till they have taken new root; after which they must be treated in the same way as other tender annual plants from the same countries, keeping them constantly in the hot bed under cover, otherwise they will not perfect their seeds in *England*.

The second sort grows naturally in *Carolina*, where the inhabitants call it *Indian Pink*. This has a perennial fibrous root, from which arise two or three erect herbaceous stalks about seven or eight inches high, garnished with three or four pair of oval, oblong, acute-pointed, smooth leaves, placed opposite, sitting pretty close to the stalk. The stalk is terminated by a short spike of flowers, which are ranged on one side; they have short empalements, which are cut into five acute segments. The tube of the flower is long, narrow at the bottom, swelling upward much larger, and is cut at the brim into five acute segments, which spread open flat; the outside of the flower is of a bright red, and the inside of a deep Orange colour. The seeds of this sort never ripen here.

This plant is used in *Carolina* for the same purposes as the other in the *West-Indies*, and is esteemed the best medicine there known for the worms. A particular account of the virtues of this plant is mentioned in the first volume of the *Philosophical Essays*, printed at *Edinburgh*, communicated by Dr. *Garden* of *Carolina*.

This is not easily propagated in *England*, for the roots make but slow increase, so that the plant is not very common in the *English* gardens at present; for although it is so hardy as to endure the cold of our ordinary winters in the open air, yet, as it does not ripen seeds, the only way of propagating it is by parting of the roots; and as these do not make much increase by offsets, so the plants are scarce. It delights in a moist soil, and must not be often transplanted.

SPINA ALBA. See *Mespilus*.

SPINACIA. *Tourn. Inst. R. H. 533. tab. 308.* Spinach; or Spinage.

The Characters are,

It is male and female in different plants; the male flowers have an empalement cut into five oblong, obtuse, concave segments, but no petals, with five hair-like stamina longer than the empalement, terminated by oblong twin summits; these are barren. The female flowers have permanent empalements of one leaf, cut into four points, two of which are very small; they have no petals, but a compressed roundish germen, supporting four hair-like styles, crowned by single stigmas. The germen afterward turns to a roundish seed, which is stout up in the empalement; in some species they are almost smooth, and in others they have two or three sharp thorns.

The Species are,

1. SPINACIA *foliis sagittatis seminibus aculeatis.* Spinach with arrow pointed leaves and prickly seeds; or common prickly Spinach.

2. SPINACIA *foliis oblongo-ovatis, seminibus glabris.* Spinach with oblong oval leaves, and smooth seeds.

The first sort was formerly more cultivated in the *English* gardens than at present, because it is much hardier, so not in much danger from cold, therefore is generally cultivated for use in winter. The leaves of this are triangular, and shaped like the point of an arrow; the stalks are hollow, branching, and herbaceous; they rise about two feet high. The male flowers are produced in long spikes; they are herbaceous, having no petals, but each has five slender stamina, terminated by oblong twin summits, filled with a yellowish farina, which, when ripe, flies out on the plants being shaken, and spreads all round; these plants, after their farina is shed, soon decay. The female flowers which are upon separate plants, sit in clusters close to the stalks at every joint; they are small, herbaceous, and have neither stamina or petals, but have roundish compressed germen, which afterward turns to roundish seeds, armed with short acute spines.

There are two or three varieties of this now cultivated in the kitchen-gardens, which differ in the size and shape of their leaves, and their seeds being more or less prickly.

The seeds of the first kind should be sown upon an open spot of ground in *August*, observing, if possible, to do it when there is an appearance of rain; for, if the season should prove dry for a long time after the seed is sown, the plants will not come up regularly; part of them may come up soon, and a great part of them may remain till rain falls; before they come up, which, if that should not happen in a little time after, many times there will not be half a crop. When the Spinach is come up pretty strong, the ground should be hoed to destroy the weeds, and also to cut up the plants where they are too close, leaving the remaining plants about three or four inches asunder; but this should always be done in dry weather, that the weeds may be destroyed soon after they are cut.

About a month or five weeks after the first hoeing, the weeds will begin to grow again; therefore the ground should be then hoed the second time, observing, as before, to do it in dry weather. But if the season should prove moist, it will be proper to gather the weeds up after they are cut, and carry them off the ground; for if the Spinach is not cleaned from weeds before winter, they will grow up, and stifle it so, that in wet weather the Spinach will rot away.

In the end of *October* the Spinach will be fit for use, when you should only crop off the largest outer leaves, leaving those in the center of the plants to grow bigger; and thus you may continue cropping it all the winter and spring, until the young Spinach, sowed in the spring, is large enough for use,

use, which is commonly in *April*; at which time the spring advancing, the winter Spinach will run up to seed; so that it should be all cut up, leaving only a small parcel to produce seeds if wanted.

But the ground in which this winter Spinach is sown, being commonly planted with early Cabbages, it is not proper to let any of the Spinach remain there for seed; therefore it should be cleared off as soon as ever the Spring Spinach is fit for use, that the Cabbages may be earthed up, and laid clear, which is of great service to them; wherefore you should sow a small spot of ground with this sort of Spinach, on purpose to stand for seed, where there should be no other plants among it.

The second sort differs from the first in having oval thick leaves, which are not angular at their base; the seeds are smooth, having no spines, and the stalks and leaves are much more fleshy and succulent. Of this there are two or three varieties, which differ in the thickness and size of their leaves, which in one are much rounder and thicker than the other.

These are sown in the spring upon an open spot of ground by themselves, or else mixed with Radish-seed, as is the common practice of the *London* gardeners, who always endeavour to have as many crops from their land in a season as possible; but where land is cheap in the country, it will be the better method to sow it alone without any other sort of seed mixed with it; and when the plants are come up, the ground should be hoed to destroy the weeds, and cut out the plants where they are too close, leaving the remaining about three inches asunder; and when they are grown so large as to meet, you may then cut out a part of it for use, thinning the plants, that they may have room to spread; and this thinning may be twice performed, as there is occasion for the herb; at the last of which the roots should be left eight or ten inches asunder; and if then you hoe the ground over again to destroy the weeds, it will be of great service to the Spinach, for if the land is good upon which it is sown, the sort with broad thick leaves, commonly called Plantain Spinach, will, with this management, many times produce leaves as large as the broad-leaved Dock, and be extremely fine.

But in order to have a succession of Spinach through the season, it will be proper to sow the seed at several different times in the spring, the first in *January*, which must be on a dry soil; the second the beginning of *February*, upon a moister soil; the third the beginning of *March*, which should be on a moist soil; and the fourth the beginning of *April*; another in *May*; but these late sowings should be hoed out thinner at the first time than either of the former, for there will be no necessity to leave it for cutting out thin for use, because the former sowings will be sufficient to supply the table till these are full grown; besides, by leaving it thin at first, it will not be apt to run up to seed so soon as it would, if the plants were close.

These sowings here mentioned are such as are practised by the kitchen-gardeners near *London*; but, as this herb is much used in soups, &c. for great tables, there should be some seeds sown every three weeks, during the summer season, to supply the kitchen; but these late sowings should be on moist strong ground, otherwise, if the season proves hot and dry, the Spinach will run to seed before the plants are fit for use, especially if the plants do not stand thin.

In order to save seeds of either of these kinds, you should sow an open rich spot of ground, with the sort you intend, in *February*, after the danger of frost is over; and when the plants are come up, they should be hoed out to six or eight inches distance, observing to cut down the weeds at the same time; and when the plants have grown about three weeks or a month longer, they

should be hoed a second time, when they should be left twelve or fourteen inches asunder at least, for when they have shot out their side branches, they will sufficiently spread over the ground.

You must also observe to keep them clear from weeds, which, if suffered to grow amongst the Spinach, will cause it to run up weak, and greatly injure it. When the plants have run up to flower, you will easily perceive two sorts amongst them, *viz.* male and female. The male will produce spikes of staminate flowers, which contain the farina, and are absolutely necessary to impregnate the embryos of the female plants, in order to render the seeds prolific. These male plants are, by the gardeners, commonly called She Spinach, and are often by the ignorant pulled up as soon as they can be distinguished from the female, in order, as they pretend, to give room for the seed bearing to spread; but, from several experiments which I made on these plants, I find, where-ever the male plants are entirely removed before the farina is shed over the female plants, the seed will not grow which they produce, so that it is absolutely necessary to leave a few of them in every part of the spot, though there may be a great many drawn out where they are too thick, for a small quantity of male plants (if rightly situated) will be sufficient to impregnate a great number of female, because they greatly abound with the farina, which, when ripe, will spread to a considerable distance, when the plants are shaken by the wind.

When the seeds are ripe (which may be known by their changing their colour, and beginning to shatter), the plants should be drawn up, and spread abroad for a few days to dry, observing to turn them every other day, that the seeds on both sides may dry equally; you must also guard the seeds from birds, otherwise they will devour them. When it is dry, the seeds should be threshed out, cleaned from the dirt, and laid up for use, where mice cannot come to them, for they are extremely fond of this seed.

SPIRÆA. *Tourn. Inst. R. H.* 618. *tab.* 389. Spiræa Frutex.

The Characters are,

The flower has a permanent empalement of one leaf, plain at the base, and cut into five acute segments at the top; it has five roundish oblong petals inserted in the empalement, and twenty or more slender stamina, which are shorter than the petals, and are inserted in the empalement, terminated by roundish summits, and five or more germen, supporting as many slender styles, which are longer than the stamina, crowned by beaded stigmas. The germen afterward turns to an oblong, acute-pointed, compressed capsule, opening with two valves, containing a few small acute-pointed seeds.

The Species are,

1. SPIRÆA foliis lanceolatis obtusis serratis nudis, floribus duplicato racemosis. *Hort. Cliff.* 191. Common Spiræa Frutex.
2. SPIRÆA foliis lobatis serratis, corymbis terminalibus. *Lin. Sp. Plant.* 489. Spiræa with lobated sawed leaves, and flowers growing in a corymbus, terminating the stalks; commonly called *Virginia Gelder Rose* with a *Currant leaf*.
3. SPIRÆA foliis integerrimis, umbellis sessilibus. *Hort. Ups.* 131. Spiræa with entire leaves, and umbels of flowers sitting close to the branches; commonly called *Hypericum Frutex*.
4. SPIRÆA foliis oblongiusculis apice serratis, corymbis lateralibus. *Lin. Sp. Plant.* 489. Spiræa with oblong leaves, whose points are sawed, and flowers growing in a corymbus on the sides of the branches.
5. SPIRÆA foliis lanceolatis inæqualiter serratis subtus tomentosis, floribus duplicato-racemosis. *Lin. Sp. Plant.* 480. Spiræa with spear-shaped leaves, which are unequally sawed, and woolly on their under side, and flowers growing in doubly-branching bunches; or *Red Spinæa*.

6. *SPIRÆA foliis pinnatis, foliolis uniformibus serratis, caule fruticoso, floribus paniculatis.* Lin. Sp. Plant. 490. Spiræa with winged leaves, whose lobes are uniformly sawed, a shrubby stalk, and flowers growing in panicles.

7. *SPIRÆA foliis lanceolatis supernè serratis nervosis, subtus incanis, floribus racemosis, caule fruticoso.* Spiræa with spear-shaped veined leaves, which are sawed toward their points, and hoary on their under side, flowers growing in long bunches, and a shrubby stalk.

8. *SPIRÆA foliis lanceolatis acutè serratis, floribus paniculatis, caule fruticoso.* Spiræa with spear-shaped leaves, which are sharply sawed, flowers growing in panicles, and a shrubby stalk.

9. *SPIRÆA foliis ternatis serratis subæqualibus, floribus subpaniculatis.* Lin. Sp. Plant. 490. Spiræa with trifoliate sawed leaves, which are almost equal, and flowers growing in a kind of panicle.

10. *SPIRÆA foliis pinnatis, foliolis uniformibus serratis, caule herbaceo, floribus cymosis.* Lin. Sp. Plant. 480. Spiræa with winged leaves, having uniform sawed lobes, an herbaceous stalk, and flowers growing on slender foot-stalks at the top; the common Dropwort.

11. *SPIRÆA foliis pinnatis, impari majore lobato, floribus cymosis.* Flor. Lapp. 201. Spiræa with winged leaves, whose outer lobe is greater, and divided into lobes, and flowers growing in bunches on weak foot-stalks; Meadow-sweet, or Queen of the Meadows.

12. *SPIRÆA foliis supra decompositis, spicis paniculatis, floribus divisis.* Lin. Sp. Plant. 490. Spiræa with more than decomposed leaves, paniculated spikes, and male and female flowers.

The first sort has been long cultivated in the *English* gardens, but from what country it originally came, is not very certain; it is generally sold by the nursery-gardeners with other flowering shrubs; it rises with several shrubby stalks, which are very taper, and rough toward the top, covered with a reddish bark. The leaves are spear-shaped, bluntly sawed on their edges, and of a bright green colour. In rich moist ground the stalks will rise six or eight feet high, but in moderate land from four to five. The branches are terminated by spikes of pale red flowers; the lower part of the spikes are branched out into small spikes, but the upper parts are close and obtuse. Each flower is composed of five petals, which spread open, of a pale red or flesh colour, and have a great number of stamina, some of which stand out much beyond the petals, but others are not so long, terminated by brown headed summits; and in the center are situated five styles, which are terminated by headed stigmas. After the flowers are past, the germen turns to pointed capsules, but they rarely come to perfection here.

This is propagated from suckers, which are sent forth in plenty from the stems of the old plants, or by laying down the tender branches, which, when rooted, should be transplanted out in rows at three feet distance, and the plants a foot asunder in the rows. In this nursery they may remain two years, observing to keep the ground clear from weeds, and in the spring to dig up the ground between the rows, so that the roots may the more easily extend themselves; but, if they put out suckers from their roots, those should be taken off to keep the shrubs within bounds, and afterwards they may be transplanted where they are to remain, either in small wilderness quarters, or in clumps of flowering shrubs, observing to place them amongst other sorts of equal growth; the young shoots of this shrub, being very tough and pliable, are often used for the tops of fishing rods.

The second sort grows naturally in *North America*, but is now as common in the *English* gardens as the first; this rises with many shrubby branching stalks sometimes eight

or ten feet high in good ground, but generally five or six feet high, covered with a loose brown bark, which falls off, and are garnished with lobed leaves, about the size and shape of those of the common Currant Bush, ending in acute points, sawed on their edges. The flowers are produced in roundish bunches at the end of the branches; they are white, with some spots of a pale red. This is commonly known in the nurseries by the title of *Virginia Gelder Rose* with a Currant leaf. It may be propagated and managed in the same manner as the former, and is equally hardy.

The third sort came originally from *Canada*, but is now as common in the nursery-gardens as either of the former, where it is known by the title of *Hypericum Frutex*, but has no affinity to *St. Johnswort*, and is only so called from the resemblance of their leaves; this rises with several slender shrubby stalks five or six feet high, covered with a dark brown bark, sending out small side branches, garnished with small, wedge shaped, entire leaves, which have many punctures on their surface like *St. Johnswort*. The flowers are disposed in small umbels, which sit close to the stalks, each flower standing upon a long slender foot-stalk; they are white, composed of five roundish petals, which spread open, and in the center have a great number of stamina, almost equal in length with the petals. The shrubs make a good appearance during the time of their flowering.

This may be propagated by laying down the under branches, which will take root in the compass of one year, when they may be taken off, and planted in a nursery for two or three years (as hath been directed for the former); after which they may be transplanted out where they are designed to remain, placing them with the two former, being nearly of the same growth, where they will add to the variety.

The fourth sort grows naturally in *Spain*; this is not very common at present in the *English* gardens. The whole appearance of the shrub is so like the third, as not to be distinguished at a small distance; the only difference being, that the leaves of this are broader at the point, where they have two or three indentures. The flowers are like those of the former. This may be propagated in the same way as the other.

The fifth sort grows naturally in *Philadelphia*; this is a shrub of lower stature than the former. The stalks are slender, and branch out near the ground; they have a purple bark, covered with a gray mealy down. The leaves are spear-shaped, but smaller than those of the first sort, and are unequally sawed; they are downy, and veined on their under side, but are of a bright green above. The branches are terminated by a thick racemus of flowers, which are branched toward the bottom into small spikes; the flowers are very small, of a beautiful red colour, and the spikes of this are longer than those of the first.

The sixth sort grows naturally in *Siberia* upon moist land; this is a shrub of humble growth in this country, seldom rising more than two feet high, putting out some side branches, which are covered with a purple bark, and garnished with winged leaves, composed of three or four pair of oblong, oval, thin lobes, sawed on their edges. The flowers are produced in panicles at the end of the branches; they are small, white, and of the same construction with the former.

The seventh sort grows naturally in *North America*; this has a shrubby stalk, which rises five or six feet high, covered with a brown bark, dividing into many strong branches, which are closely garnished toward their end with spear-shaped veined leaves, hoary on their under side, and are sawed on their edges toward their points. The flowers are white, and disposed in a racemus.

The eighth sort grows naturally in *North America*; this rises with shrubby stalks like the first, but sends out horizontal branches which are slender, and covered with a brown bark. The leaves are spear-shaped, of a thin texture, and of a bright green colour on both sides; they are slightly sawed on their edges, but the saws are acute. The flowers are disposed in panicles at the end of the branches; they are small, white, and of the same construction of the former.

These sorts are propagated in the same way as the first, but, as some of them do not put out suckers from their roots here in any plenty, their branches should be laid down in autumn, which in one year will take root, and may then be planted where they are designed to remain, or into a nursery, where they may stand one or two years to get strength, before they are planted out for good.

The ninth sort grows naturally in *North America*; this has a perennial root, but the stalks are annual, and rise about a foot high, sending out branches from the side their whole length; these are garnished with leaves, which for the most part are trifoliate, but are sometimes single, and at others by pairs, sharply sawed on their edges, of a bright green on their upper side, and pale on their under. The flowers are disposed in loose panicles at the top of the stalks, standing upon slender foot-stalks; they have five long spear-shaped petals, which spread open, and a great many stamina, which are no longer than the tube of the flower.

It is propagated by seeds, which should be sown on a shady border soon after they are ripe, for if they are sown in the spring, the plants will not come up till the year after, and many times fail. When the plants appear, they must be constantly kept clean from weeds; but they should not be removed till autumn, when their leaves begin to decay; then they may be either transplanted where they are designed to remain, or into a nursery border, where they may grow a year or two to get strength, before they are planted out for good. This plant loves a shady situation and a moist light soil.

The tenth sort is the common Dropwort, which grows plentifully upon chalky grounds in many parts of *England*. The roots of this consist of a great number of oval knobs or glandules, which are fastened together by slender fibres, from whence it had the title of Dropwort; the leaves are winged, and composed of many sawed lobes, which are almost placed alternately along the midrib; those near the base are the smallest, the others increase in size to the middle, afterward decrease again to the point. The flower-stalk rises a foot or more in height, and has seldom more than one leaf upon it; the top is garnished with loose bunches of small white flowers, standing upon slender foot-stalks, which are succeeded by several capsules, ranged circularly. The roots of these plants are used in medicine, and are accounted diuretick. It is rarely kept in gardens, but there is a variety of this with double flowers, which was found growing naturally in the north of *England*, that is kept in gardens for the sake of variety.

The eleventh sort grows naturally on the sides of waters, and in low moist meadows, in most parts of *England*. The stalks are angular, red, and rise three or four feet high, garnished with winged leaves, composed of two or three pair of large indented lobes, terminated by an odd one, which is much larger than the other, and divided into three lobes; they are of a dark green on their upper side, but hoary on their under. The stalks are terminated by large loose bunches of white flowers, which have an agreeable scent, and are succeeded by roundish capsules, twisted like a screw, filled with small seeds.

The leaves and tops of this plant are used in medicine, but the plants are rarely kept in gardens. There is a va-

riety of it with double flowers, which is kept in some gardens, and one with variegated leaves.

The twelfth sort grows naturally upon the mountains in *Austria*; this has a perennial root and an annual stalk, which rises from three to four feet high, garnished with decomposed winged leaves, composed of several doubly-winged leaves, each having three or four pair of oblong lobes, terminated by an odd one, sawed on their edges, and ending in acute points. The flowers are disposed in loose spikes, which are formed into loose panicles at the top of the stalks; they are small, white, and of two sexes in the same spike. The seeds rarely ripen here.

This plant is kept in gardens for the sake of variety; it may be propagated by parting of the root in autumn; it loves a moist soil and a shady situation.

SPIRÆA OF AFRICA. See Diosma.

SPONDIAS. The *Jamaica Plum*.

The Characters are,

The flower has five oblong spear-shaped petals, and a small permanent coloured empalement, with ten scaly obtuse nectariums, situated between the petals, and ten bristly stamina shorter than the petals, with oblong summits; the oblong germen, which is immersed in the receptacle, supports five short parallel styles, joined in a five cornered column, crowned by a simple stigma; and afterward becomes an oblong fleshy berry, inclosing a hard oblong nut, covered with fibres, having five cells.

We have but one Species of this genus at present in the *English gardens*, viz.

SPONDIAS foliis pinnatis, pinnis acuminatis serratis. The yellow, or *Jamaica Plum*.

This tree is of humble stature, seldom rising more than twelve or fourteen feet high in the *West-Indies*, but in *England* is rarely more than half that height; the bark is brown, the leaves are very long, composed of a great number of pinnæ, placed alternate along the midrib, terminated by an odd one; these are sawed on their edges, and end in acute points. The flowers terminate the branches in a racemus, and are of a whitish yellow colour, some of which are succeeded by oblong fleshy berries, of a pale yellow colour, covered with a mealy farina; the flesh of which is but thin, of a luscious sweet taste. The nut inclosed appears as if composed of many ligneous fibres.

The fruit of this sort is esteemed by some of the inhabitants of the islands in the *West-Indies*; but as the flesh is very thin, so a great number of the Plums will afford but little meat: however, the wild hogs are very fond of them, and it is their principal food during the season of their ripening.

The trees are easily propagated in *America*, by planting some of the branches which readily take root in the rainy seasons. The cuttings will also grow in *England*, if properly managed; but here they are generally raised from the fruit, which are frequently brought from some of the islands in *America*, which, when fresh, come up very readily. The *Leeward Islands* generally furnish the best, as their passage is not so long as from *Jamaica*. The nuts should be planted as soon as they arrive in pots, which should be plunged into a hot-bed of tan, where, if the bed is of a good temperature of heat, the plants will appear in a month or five weeks after. When the plants have obtained strength enough to be removed, they should be shaken out of the pots, and carefully parted, planting them in separate small pots, and plunging them into a fresh hot-bed of tan, shading them daily from the sun until they have taken new root; after which they should have air, and be supplied with water in proportion to the warmth of the season; but they are too tender to thrive in the open air in *England* in the warmest season, therefore should be constantly kept in the bark-stove, and, if carefully managed, will ripen their fruit here. The

plants generally drop their leaves in spring, and often remain naked two or three months.

SQUASHES. See Pepo.

SQUILLS. See Scilla.

STACHYS. *Tourn. Inst. R. H. 186. tab. 86.* Base Horehound.

The Characters are,

The flower has a tubulous permanent empalement, cut into five acute parts at the top; it has one lip-shaped petal with a short tube, having oblong chaps. The upper lip is erect, hooked, and a little indented at the point, and cut into three parts. It has four awl-shaped stamina, two of which are longer, and inclined to the upper lip; the other two are shorter, terminated by single summits, and a four-pointed germen, supporting a slender style the length of the stamina, crowned by a bifid acute stigma. The germen afterward turns to four oblong angular seeds, which ripen in the empalement.

The Species are,

1. STACHYS caule erecto sulcato tomentoso, foliis ovato-lanceolatis tomentosis crenatis, verticillis piloso-tomentosis. Base Horehound with an erect, furrowed, woolly stalk, oval, spear-shaped, woolly leaves, which are crenated, and woolly whorls of flowers.

2. STACHYS verticillis triginta floris, calycibus pungentibus. *Hort. Upsal. 170.* Base Horehound with thirty flowers in the whorls, and prickly empalements.

3. STACHYS foliis lineari-lanceolatis tomentosis subcrenatis, petiolis longissimis, caule fruticoso tomentoso. Base Horehound with narrow, spear-shaped, woolly leaves, which are somewhat crenated, with very long foot-stalks, and have a shrubby woolly stalk.

4. STACHYS foliis oblongo ovatis crenatis pilosis, calycibus pungentibus, labii superiore piloso. Base Horehound with oblong, oval, crenated, hairy leaves, prickly empalements to the flowers, and the upper lip hairy.

5. STACHYS foliis cordatis obtusè serratis, verticillis minoribus lanuginosis, calycibus acutis. Base Horehound with heart-shaped, obtuse, sawed leaves, smaller whorls of flowers, which are woolly, and acute empalements to the flowers.

6. STACHYS foliis inferioribus ovato-oblongis subcrenatis subtus tomentosis, caulibus cordatis acutis sessilibus, calycibus spinosis. Base Horehound with oval, oblong, lower leaves, which are slightly crenated, and woolly on their under side, those on the stalks being heart-shaped, acute-pointed, and fitting close to the stalks, and prickly empalements to the flowers.

7. STACHYS ramis ramosissimis, foliis lanceolatis glabris. *Hort. Cliff. 310.* Base Horehound with very spreading branches, and smooth spear-shaped leaves.

8. STACHYS verticillis sexfloris, foliis lineari lanceolatis semiamplexicaulis. *Flor. Suec. 490.* Base Horehound with whorls of six flowers, and narrow spear-shaped leaves, which half embrace the stalk.

The first and last sort here mentioned, grow naturally in England; the first only in a few particular places, but the latter is common by the side of ditches and waters every where, and is here only mentioned, because it is a dispensary plant, and has been supposed a good vulnerary herb. Of this there is another species, which was found by Mr. Stonestreet growing wild, with narrow leaves, shorter stalks, longer and closer spikes of flowers, and the leaves stand distinct upon short foot-stalks: this has constantly retained its difference in the garden. Both these sorts have creeping roots, so will soon spread over a large spot of ground where they have liberty.

The seventh sort grows naturally in Crete; this is a low plant with an herbaceous stalk, which is very branchy from the bottom. The stalks are slender, four-cornered, and

smooth, garnished with a few small spear-shaped leaves: the whole plant is very clammy, and smells like bitumen. The flowers are small, of a dirty white colour, and stand in small whorls round the stalks; these appear in July, and are succeeded by roundish seeds, which ripen in autumn. This is propagated by seeds, and requires to be sheltered under a frame in winter, being too tender to live in the open air here.

The other sorts are kept in botanick gardens for the sake of variety, but are not cultivated in other places, so it will be needless to give a particular description of them here.

They are all propagated by seeds, which should be sown in March upon a bed of light fresh earth; and when the plants are come up, they may be planted out into other beds about six inches asunder, observing to water them until they have taken root; after which they will require no farther care, but to keep them clear from weeds till Michaelmas, when they should be transplanted where they are to remain, which must be in an open situation, and upon a dry light soil, not rich, in which they will endure the winter much better than in good ground. The summer following these plants will flower, and in August their seeds will ripen, when they may be gathered and preserved till spring for sowing.

STÆHELINA. *Lin. Gen. Plant. 844.*

The Characters are,

The common empalement of the flower is oblong, cylindrical, and imbricated; the scales are reflexed; the flower is composed of several uniform funnel-shaped florets, of one petal. The brim is cut into five equal acute points; they have each five hair-like stamina, terminated by cylindrical summits, and a short crowned germen, supporting a slender style, crowned by a double oblong stigma. The germen afterward becomes a short four-cornered seed, crowned with a feathery down, which ripens in the empalement.

The Species are,

1. STÆHELINA foliis tomentosis, squamis calycinis lanceolatis. *Lin. Sp. Plant. 840.* Stæhelina with woolly leaves, and spear-shaped scales to the empalement.

2. STÆHELINA foliis subtrigonis, squamis calycinis crenatis. *Lin. Sp. Plant. 840.* Stæhelina with leaves which are almost three-cornered, and crenated stalks to the empalement.

The first sort grows naturally at the Cape of Good Hope, from whence it was introduced into the Dutch gardens; this rises with a shrubby stalk about three feet high, which divides into several branches, garnished with long taper woolly leaves, set thinly. The flowers are produced at the end of the branches in single heads, which are pretty large, and have scaly empalements; these terminate in spines, and are recurved; they are composed of several florets, which are tubulous, hermaphrodite, and of a yellow colour, each of which is succeeded by a single four-cornered seed, crowned with a feathery down, ripening in the empalement, each being separated by a chaffy scale.

The second sort is a native of the same country; this is a low shrub, seldom rising more than two feet high, sending out many slender branches, which are garnished with leaves placed alternate; there is a small knob or angle just under that part where the leaf is inserted to the branch; the leaves are narrow, and have three blunt angles or corners. The branches are terminated by a single flower, whose empalement is oval, and like those of the flowers of Knapweed, being imbricated. The scales are oblong, oval, and their points are rounded; some of them have a large membranaceous border, whose edge is crenated, and spread open; the florets are yellow and equal, of the same length as the empalement; they are all hermaphrodite, and have a bifid stigma, and the seeds have a little hairy down on their top.

As these plants do not always ripen their seeds in *England*, so they are generally propagated by cuttings, which, if planted in any of the summer months, and covered close with a bell or hand-glass, will take root pretty freely. When these have made good roots, they should be taken up carefully, and planted in pots, filled with fresh light earth, not too rich, and placed in the shade until they have taken new root; then they should be removed to a sheltered situation, where they may be intermixed with other exotic plants till the autumn, when they must be removed into shelter, and treated in the same way as other plants from the same country. These plants do not require any artificial heat in winter, but should have a dry air, for their tender shoots are very subject to rot with damp; therefore they will thrive better in a glass-case than a green-house in winter.

STAPELIA. *Lin. Gen. Plant.* 271. Swallow-wort, or *Fritillaria crassa*.

The Characters are,

The flower has a permanent empalement of one leaf, cut into five acute segments; it has one large plain petal, cut into five acute segments above the middle, and a plain five-pointed starry nectarium, with linear segments, whose torn points surround the parts of generation; it has five plain, broad, erect stamina, with linear summits fastened on each side the stamina, and two oval plain germen, having no style, crowned by a blunt stigma. The germen afterward turns to two oblong taper pods, filled with compressed seeds, crowned with a feathery down, lying over each other like the scales of fish.

The Species are,

1. STAPELIA *denticulis ramorum patentibus*. *Vir. Cliff.* 20. Stapelia with spreading indentures to the branches; commonly called *Fritillaria crassa*.

2. STAPELIA *denticulis ramorum erectis*. *Hort. Cliff.* 77. Stapelia with erect indentures to the branches.

There is another species of this genus, which has been lately introduced into the *English* gardens, whose branches are larger, more erect, and the indentures are not so erect as those of the second sort; but, as it has not produced flowers in this country, nor is described in books, so I cannot say more of it, only that it is not so hardy as either of the former, therefore requires a stove in winter to preserve it in *England*.

There is also a variety of the first sort mentioned in some books, with flat crested branches, and is by some gardeners titled Coxcomb Fritillary; but this is no other than an exuberance of branches joined together, which become flat, so will return back to its original again, therefore is not worthy notice.

The first sort hath many succulent branches arising from the root, which are five or six inches long, having several protuberant indentures on their sides, spreading open horizontally, ending in acute points; the branches which spread on the ground, emit roots from their joints; so where they have room will extend very wide. The branches abound with a viscous juice of a nauseous taste. From the side of the branches toward their bottom comes out the foot-stalk of the flower at one of the sinuses, and sustains one flower, having a large thick petal cut half way into five points like a star, which spreads open flat, greenish on the outside, but yellow within, having a circle of purple round the nectarii; and the whole petal is finely spotted with purple, resembling the belly of a frog. In the center are the five compressed nectarii which are prominent, of a livid colour, which include the genital parts. The flower when blown has a very foetid odour, like that of carrion, so like, as that the common flesh fly deposit their eggs on it, which frequently are hatched, but wanting proper food, die soon after; for I have many years watched the progress of these, to see if

the maggots produced from these eggs ever eat any part of the flower, or lived any time; but could never observe either, nor have ever heard that any other person of credit has ever discovered any thing like it, though it has been asserted, by persons of more assurance than knowledge, that they have devoured great part of the petal, and come to maturity, changing afterward into their last state of flies. After the flowers are past, the double germen changes into two taper pods, joined at their base, which are near a span long, and almost as thick as a man's little finger, which are filled with flat seeds, crowned with a feathery down, lying over each other like the scales of fish; but these pods are seldom formed in *England*, unless the pots in which they grow are plunged in tanners bark; for in upward of forty years which I have cultivated these plants, I never saw them produce their pods but three times, and those were plunged into the tan-bed in the stove.

The branches of the second sort are much larger than those of the first, and stand more erect, but spread and emit roots in the same way; they have four longitudinal furrows, which divide them into four angles, which have protuberant indentures on their edges, whose points are erect; they are nearly of the same colour as those of the first, being of a dark green in summer, but inclining to purple in autumn. The flowers come out upon short foot-stalks from the side of the branches; these are of the form with those of the former, but are larger; the petal is of a thicker substance, and on the inside covered with fine purplish soft hairs; the ground of the flower is an herbaceous yellow, streaked and chequered with purplish lines. This sort produces its flowers in much greater plenty than the first sort, so that in summer and autumn they are seldom long destitute of flowers; but I have never seen any of the pods of this sort produced in *England*.

Both these plants grow naturally upon the rocks near the *Cape of Good Hope*, where they strike their roots into the crevices of the rocks and spread themselves greatly. They are propagated here very easily, by taking off any of the side branches, during any of the summer months, which, when planted, put out roots very freely. The branches should be slipped off from the plants to the bottom, where they are joined by a small ligature, so will not occasion a great wound, the joints at the place where they are connected being almost closed round; for if they are cut through the branch, the wound will be so great as to occasion their rotting when planted; these should be laid in a dry place under cover for eight or ten days, that the wounded part may dry and heal over, before they are planted, otherwise they will rot; then they should be planted in pots, filled with earth, composed of fresh sandy earth, mixed with lime rubbish and sea sand; and if the pots are plunged into a very moderate hot-bed, it will promote their taking root; they should be now and then sprinkled with water, but it must be given them sparingly, and as soon as they have taken root, they must be inured to the open air. If these plants are kept in a very moderate stove in winter, and in summer placed in an airy glass-case, where they may enjoy much free air, but screened from wet and cold, they will thrive and flower very well, for although they will live in the open air in summer, and may be kept through the winter in a good green-house, yet these plants will not flower so well as those managed in the other way. These plants must have little water given them, especially in winter.

STAPHYLÆA. *Lin. Gen. Plant.* 336. Bladder Nut.

The Characters are,

The empalement is concave, coloured, and so large as to inclose the flower, which has five oblong erect petals, and a pitcher-shaped concave nectarium at the bottom of the flower, with five oblong erect styles, terminated by single summits, and a thick germen, divided

divided in three parts, supporting three styles, to which there are obtuse stigmas contiguous. The germen afterward becomes two hard almost globular seeds, included in three bladders, joined by a longitudinal seam, with an acute point opening within.

The Species are,

1. STAPHYLÆA foliis pinnatis. Hort. Cliff. 112. Bladder Nut with winged leaves.

2. STAPHYLÆA foliis ternatis. Hort. Cliff. 112. Bladder Nut with trifoliate leaves; or three-leaved *Virginian* Bladder Nut.

The first sort grows naturally in woods in several parts of *England*, but is cultivated as a flowering shrub in the nursery-gardens. This hath several shrubby stalks arising from the same root, which grow ten or twelve feet high, covered with a smooth bark, and divide into several branches, which are pithy, garnished with winged leaves, composed of two pair of oval lobes, terminated by an odd one; these differ greatly in size according to the strength and vigour of the shrubs. They are smooth, entire, and of a light green colour, standing upon pretty long foot-stalks. The flowers come out upon long slender foot-stalks, which hang downward; these spring from the wings of the stalks near their extremity, and are disposed in oblong bunches; they have each five oblong white petals, which expand in form of a Rose; these are succeeded by inflated capsules or bladders, composed of three cells, one or two of which have a roundish, smooth, hard seed, and the other are barren.

This shrub makes a variety when intermixed with others, though their flowers are not very beautiful. The nuts of this tree being hard and smooth, are strung for beads by the Roman Catholicks in some countries; and the children of the poor inhabitants eat the nuts, though they have a disagreeable taste.

The second sort grows naturally in *North America*, but is now become as common in the nursery-gardens about *London* as the other. This hath a more substantial stalk than the first; the bark of the older branches and stalks is smooth, and of a gray colour; that of the young is of a light green and very smooth; the leaves are by threes on each foot-stalk; the lobes are oval, ending in a point, and their edges are sawed; they are of different sizes, according to the age and strength of the plants; they are smooth, and of a light green colour. The flowers are produced from the side of branches, in longer bunches than those of the former sort, but their foot-stalks are much shorter; the flowers are of a cleaner white, and their petals are somewhat larger than those of the first, as are also the Bladder capsules; the seeds are larger, and ripen better than those of the common sort.

Both these sorts are usually propagated by suckers, from the root which the first sort sends out in plenty; these should be taken from the old plants in autumn, and their roots trimmed, then planted in a nursery, in rows at three feet distance, and one foot asunder in the rows. In this nursery the plants should stand one or two years, according to their strength, and then be transplanted to the places where they are to remain.

The plants which are propagated in this manner from suckers, are very subject to put out suckers in greater plenty from their roots than those which are raised from seeds, or propagated by layers or cuttings, so are not to be chosen when the other can be had; therefore those who propagate them for their own use, should prefer the other methods. If they are propagated by layers, the young branches should be laid down in autumn, in the same manner as is practised for other trees and shrubs; these will have put out roots the following autumn, when they may be taken from the old plants, and planted in a nursery, where they may grow one or two years to get strength, and then may be removed to the places where they are to stand.

When these are propagated by cuttings, it should be the shoots of the former year, and if they have a small piece of the two years wood at the bottom, they will more certainly succeed; for as the young shoots are soft and pithy, so they are very subject to rot, when they have no part of the old wood to them. They should be planted in autumn on a shady border, but must not have too much wet.

They may also be propagated by sowing their seeds early in autumn, in beds of light fresh earth; and when the plants are come up, they must be carefully kept clear from weeds, and, in very dry weather, if they are now and then refreshed with water, it will greatly promote their growth; in these beds they may remain until *October* following, at which time they should be carefully taken up, and planted in a nursery, placing them in rows three feet asunder, and the plants one foot distance in the rows; and, if the following spring should prove very dry, it will be convenient to give them a little water, to encourage their taking root; after which they will require no farther care, but to keep the ground clear from weeds in summer, and every spring to prune off irregular branches, and dig the ground between the rows, to loosen the earth, that their roots may the more easily extend. In this nursery they may remain two years, by which time it will be proper to transplant them out where they are to remain, either in wilderness quarters, or in clumps of various trees, where they will add to the diversity. The best season for transplanting these trees is in autumn, with other deciduous trees. When these seeds are sown in the spring, the plants seldom come up till the following year.

AFRICAN BLADDER NUT. See *Royena*.

LAUREL-LEAVED AMERICAN BLADDER NUT. See *Ptelea*.

STAR-FLOWER. See *Ornithogalum*.

STARWORT. See *Aster*.

STATICE. *Journ. Inst. R. H.* 341. tab. 177. Thrift, or Sea Pink.

The Characters are,

The flowers are collected in a roundish head, surrounded by a common scaly empalement; each flower has also a funnel shaped empalement of one leaf; the flowers are funnel-shaped; the base of the petals are narrow, their points broad, and spread open; they have five stamina which are shorter than the petals, terminated by prostrate summits; and a small germen, supporting five styles, which stand apart, crowned by acute stigmas. The germen afterward turns to one small roundish seed, inclosed in the empalement.

The Species are,

1. STATICE foliis lanceolato-linearibus, squamis calycinis inferioribus acutis. Thrift with spear-shaped linear leaves, and the lower scales of the empalement acute-pointed.

2. STATICE foliis linearibus subulatis, squamis calycinis obtusis. Thrift with linear awl-shaped leaves, and obtuse scales to the empalement.

3. STATICE foliis linearibus planis, squamis calycinis obtusis. Thrift with plain linear leaves, and obtuse scales to the empalement; or Sea Pink.

The first sort grows naturally on the *Alps*, and other cold mountains in several parts of *Europe*. This has a perennial fibrous root, from which come out many narrow, smooth, spear-shaped leaves, of a dark green colour, sitting close over each other at their base. The foot-stalks of the flowers are naked, and rise about a foot high, terminated by one globular head, containing several small, pale, red flowers, which are included in one common scaly empalement; immediately under the flower is placed five narrow leaves, which afterward fall off. The flowers are succeeded by oblong seeds, which are closely wrapped up in the particular empalement of the flower. There are two varieties

of this, one with white flowers, and the other a bright red.

The second sort is also a native of the *Alps*, and other cold mountains, where it seldom rises more than two inches high, but when it is planted in gardens, it becomes much larger. The roots of this are fibrous and perennial; they divide into heads, which have a great number of narrow Grass-like leaves, fitting close round the heads, whose base embrace the stems, and lie over each other. The stalks are naked, and rise about six inches high, sustaining on their tops heads of pale purplish flowers, inclosed in one common scaly empalement, whose scales are broad, and rounded at their points.

The third sort grows naturally in salt marshes, where the sea flows over them frequently, in many parts of *England*, so is very rarely admitted into gardens. The leaves of this sort are very narrow, short, and plain; the stalks seldom rise more than three or four inches high; the heads of flowers are small, and the flowers are of a very pale flesh colour, so make but little appearance.

There was some years past another species of this genus in the *English* gardens, which came from *Portugal*, with a thick perennial stalk, which by age became shrubby, and rose a foot and a half in height; the leaves like those of the first sort, but much larger; the foot-stalks of the flowers were a foot and a half long, naked, and terminated by one large globular head of flowers, of a pale red colour; but all the plants of this kind which were in *England*, the severe frost in the beginning of the year 1740 destroyed, since which time I have not seen one plant.

The second sort was formerly planted in gardens, to make edgings on the sides of borders in the flower-gardens; for which purpose they were then in great esteem, but of late they have been very justly rejected, because there was a necessity of transplanting these edgings every year, otherwise they could not be kept within due bounds; besides, wherever a plant failed, which was no extraordinary thing, there always appeared a large unfightly gap; however, though they are not in use at present for that purpose, yet a few plants of the first and second should have a place in some part of the flower-garden for variety, especially the variety with red flowers; they will grow in almost any soil or situation, and their flowers will continue a long time in beauty, especially in a shady situation.

All these sorts may be propagated by parting their roots; the best time for which is in autumn, that they may take root before the frost, for these will flower much stronger than those transplanted in the spring; and the plants will not be in so much danger of miscarrying, especially when the spring happens to prove dry. After these plants have taken root, they will require no farther care, but to keep them clear from weeds, and to transplant and part their roots annually, for if they are permitted to stand longer unremoved, they are very subject to rot and decay, especially when they are planted in good ground.

STEWARTIA. *Lin. Gen. Plant.* 758.

The Characters are,

The flower has a permanent empalement, cut into five oval concave segments; it has five large oval petals, which spread open, and a great number of slender stamina, joined in a cylinder at bottom, and are shorter than the petals, to which they are connected at their base, terminated by roundish prostrate summits, with a roundish hairy germen, supporting five styles the length of the stamina, crowned by obtuse stigmas. The germen afterward turns to a five-cornered capsule with five cells, opening with five valves, whose cells are closed, each containing one oval compressed seed.

We have but one Species of this genus, viz.

STEWARTIA. *Art. Upsal.* 1741. *Stewartia.*

This shrub grows naturally in *Virginia*, where it rises with strong ligneous stalks to the height of ten or twelve feet, covered with a brown bark, and garnished with oval spear-shaped leaves, sawed on their edges, and pretty much veined, standing alternately. The flowers are produced from the wings of the stalk; their empalements are of one leaf, cut into five obtuse segments almost to the bottom. The flower is of one petal (according to *Ray* and *Tournefort*) which is cut into five parts almost to the bottom, but their base are connected together, and fall off united; the segments are narrow at their base, but spread open, are broad, and obtuse at their points, and hollowed like a spoon in the middle; they are white, but one of the segments in each flower is stained with an herbaceous yellow colour. In the center of the flower arise five styles, which are surrounded by a circle of purple stamina, terminated by roundish blue summits. The stamina are inserted to the base of the petals, so form at their base one body, being there connected together. The fruit of this is a conical, dry, ligneous capsule, having five sharp angles, and five cells, which open at the top with five valves, each cell containing one oblong smooth seed.

This shrub is at present very rare in the *English* gardens. The seeds are seldom brought to *England*, and those frequently fail, either by their not having been properly impregnated, or duly ripened, for I have examined several which have been hollow, having only a shell; and the plants which do come up, are very difficult to maintain while young, for if they are exposed to too much sun, they will soon be destroyed, nor do they thrive when exposed to the open air. The only way in which I have seen the young plants succeed was, when they were sown under glasses, and the surface of the ground between the plants was covered with moss to keep the ground moist, and the glasses were constantly shaded every day when the sun was bright. With this management the plants seemed in good health, but made little progress in their growth.

STOCK GILLIFLOWER. See *Cheiranthus*.

STOEBE. *Lin. Gen. Plant.* 839.

The Characters are,

The flower is composed of many hermaphrodite florets, included in one common empalement, whose scales are awl-shaped and permanent; between each scale is situated one floret, whose empalement is composed of five narrow acute leaves, which are equal and erect. The florets are funnel-shaped, of one petal, cut into five points at the brim; they have five short hair-like stamina, terminated by cylindrical summits, and an oblong germen, supporting a slender style, crowned by a bifid acute stigma. The germen afterward becomes a single seed, crowned with a long feathery down, sitting in the common empalement.

We have but one Species of this genus, viz.

STOEBE. *Hort. Cliff.* 390. *Stoebe.*

This plant grows naturally at the *Cape of Good Hope*; it is perennial, having a ligneous stalk, which rises two or three feet high, sending out slender branches from the sides, garnished with short linear leaves, that are for the most part hooked, of a grayish colour, and placed irregularly round the branches. The flowers are produced in single heads at the end of the branches; they are of a pale yellow colour, and are composed of several hermaphrodite florets, included in one common empalement, whose scales lie over each other like those of fish. The florets are single, and peep out between the scales of the empalement.

It is propagated by cuttings or slips, which should be planted in *July* upon a bed of soft loam, and covered close down either with a bell or hand-glass, shading them every day from the sun till they have taken root; then they must be gradually inured to the open air, and afterward taken up, and planted in pots, placing them in the shade till they

they have taken new root; then they may be placed in a sheltered situation with other tender exotic plants, and in autumn they must be removed into shelter, for they are too tender to live through the winter in the open air in *England*.

STOECHAS. *Tourn. Inst. R. H. 201. tab. 95.* Cassidony, *French* Lavender, or Stickadore.

The Characters are,

The flower has an oval permanent empalement, whose brim has some obscure indentures; it is of the lip kind, having a cylindrical tube longer than the empalement, whose brim spreads open. The upper lip is large, bifid, and open; the under lip is cut into three roundish almost equal segments. It has four stamina within the tube, which are turned aside, two of which are shorter than the other, terminated by small summits, and a quadrifid germen, supporting a slender style the length of the tube, crowned by an obtuse indented stigma. The germen afterward turns to four almost oval seeds, which ripen in the empalement. To which the following notes must be added: the flowers are ranged in several series, and the spikes are terminated by tufts of leaves.

The Species are,

1. STOECHAS foliis lanceolato-linearibus, pedunculis brevioribus. Stoechas with spear-shaped linear leaves, and shorter foot-stalks to the flowers.

2. STOECHAS foliis lanceolato-linearibus, pedunculis longissimis. Stoechas with spear-shaped linear leaves, and the longest foot-stalks to the flowers.

3. STOECHAS foliis pinnato-dentatis. Stoechas with wing-indent leaves.

The first sort grows naturally in the south of *France* and *Spain*, from whence the tops or heads of flowers are imported to *England* for medicinal use; this has a low, thick, shrubby stalk, which rises about two feet high, sending out ligneous branches the whole length, which are garnished with spear-shaped linear leaves about an inch long, which are hoary and pointed, of a strong aromattick scent, and stand opposite on the branches at each joint, with smaller leaves of the same shape, coming out at the same places. The branches are terminated with scaly spikes of purple flowers about an inch in length; the spikes are four-cornered; the scales lie over each other like those of fish; out of each scale peeps one lip flower, whose tube is the length of the scale, so the two lips only appear; the under is spread open, and the upper stands erect. The spike of flowers is terminated by a small tuft of purple leaves like the Clary of *Matthiolus*; the flowers are succeeded by oval seeds, which ripen in autumn. The whole plant has a very strong, aromattick, agreeable odour.

The heads of flowers of this kind are used in some of the capital medicines directed by the College of Physicians, which are commonly brought from the south of *France*, where the plants are in great plenty; but, as these are seldom imported, and very little care taken in the drying and packing them, they are very apt to take a mouldiness in their passage, and are not near so good for use as those which are gathered fresh in *England*, where the plants may be cultivated to great advantage.

The second sort grows naturally in *Spain*. The difference between this and the first consists in the foot-stalks, which sustains the spikes of flowers, being three times the length of those of the first sort, and naked, having no leaves. The spikes of flowers are longer, and not so thick, and have more coloured leaves on their tops, which are longer, and of a brighter purple colour. These differences are not accidental, for I have many years propagated this plant by seeds, and have always found the plants produced were the same. Of both these there are some plants which vary in the colour of their flowers, some producing white, and others purplish flowers, but the most common colour is blue.

These plants may be cultivated by sowing their seeds upon a bed of light dry soil in *March*, and when they come up, they should be carefully cleared from weeds until they are two inches high, at which time they should be removed; therefore there must be a spot of light dry ground prepared, and laid level, which must be trodden out in beds, into which the plants should be planted at about five or six inches distance each way, observing to water and shade them until they have taken root; after which they will require no further care, but to keep them clear from weeds the following summer; but, if the winter should prove severe, it will be proper to cover them with mats, Peas haulm, or some other light covering, to guard them against the frost, which otherwise would be apt to injure them while they are so young; but in *March*, or the beginning of *April*, the following spring, they must be removed into the places where they are to remain, observing, if possible, to transplant them in a warm moist season, and not to let them remain long above ground, for if their roots are dried, they seldom grow well after. The soil in which these are planted, should be a dry warm sand or gravel, and the poorer the soil is in which they are planted, the better they will endure the cold of the winter, provided the ground be dry, though indeed the plants will thrive better in summer upon a rich moist ground; but then they will not produce so many flowers, nor will the heads or spikes have near so strong an aromattick scent, as is the case with most sorts of aromattick plants.

These plants may also be propagated by planting slips or cuttings of any of the kinds in the spring, observing to refresh them with water until they have taken root; after which they may be managed as hath been directed for the seedling plants; but, as those plants raised from seeds are much better than these, it is hardly worth while to propagate them this way, especially since their seeds ripen so well in this country.

The heads of the first sorts may be gathered for use when the flowers are in full perfection, and spread to dry in a shady place, after which they may be put up for use.

The third sort grows naturally in *Andalusia* in *Spain*, and also about *Murcia*; this has a ligneous stalk, which rises two or three feet high, furnished with branches on every side, which are four-cornered, and garnished with leaves, placed opposite by pairs, indented regularly on both sides, almost to the midrib, in form of winged leaves; they are of a grayish colour, have a pleasant aromattick odour and biting warm taste. The flowers are produced in scaly spikes at the end of the branches, standing upon long naked foot-stalks; they are four-cornered, hairy, and about an inch long, terminated by a few purplish leaves in the like manner as the other sorts, which inclined me to keep it joined to them. It flowers great part of summer, but the seeds very rarely ripen in *England*.

As this plant seldom produces seeds in *England*, it is propagated by slips or cuttings, which, if planted in *April*, and treated in the same way as those of the two other sorts, will take root very freely; but these plants, when rooted, must be planted in pots, that they may be sheltered from severe frost in winter, because they are too tender to live in the open air through the winter in *England*, especially while they are young; but, when they have obtained strength, some of them may be turned out of the pots, and planted in a warm situation, upon a dry rubbishy soil, where they will be stinted from growing too vigorously, so will endure the cold much better than if they were growing in better ground.

STONECROP. See Sedum.

STONECROP TREE. See Chenopodium.

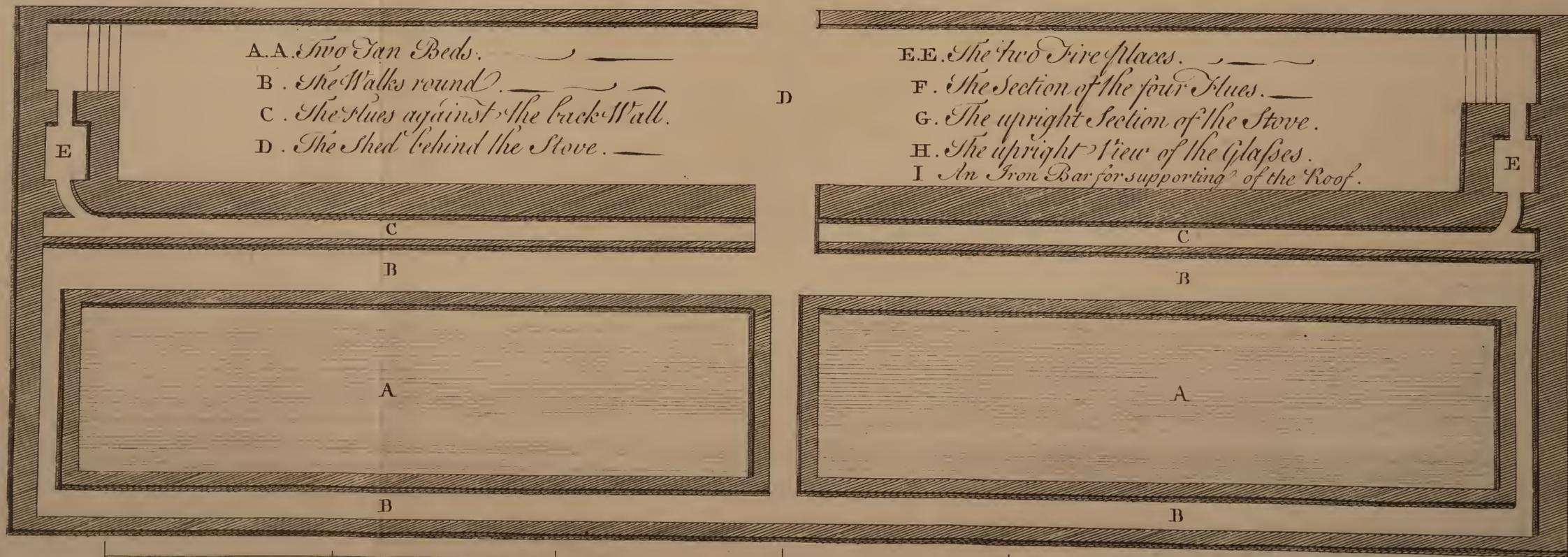
STOVES are contrivances for the preserving such tender exotic plants, which will not live in these northern countries

Pl. I.



A.A. Two Tan Beds.
 B. The Walks round.
 C. The flues against the back Wall.
 D. The Shed behind the Stove.

E.E. The two Fire places.
 F. The section of the four Flues.
 G. The upright Section of the Stove.
 H. The upright View of the Glasses.
 I. An Iron Bar for supporting^g of the Roof.



8 G.

60 50 40 30 20 10 5 Feet

tries without artificial warmth in winter. These are built in different methods, according to the ingenuity of the artist, or the different purposes for which they are intended, but in *England* they are at present reducible to two or three.

The first is called a dry stove, being so contrived, that the flues through which the smoke passes, are either carried under the pavement of the floor, or else are erected in the back part of the house, over each other, and are returned six or eight times the whole length of the building, according to the height. In these stoves the plants are placed on shelves of boards laid on a scaffold, rising above each other like the seats in a theatre, for the greater advantage of their standing in sight, and enjoying an equal share of light and air. In these stoves are commonly placed the tender sorts of Aloes, Cereuses, Euphorbiums, Tithymals, and other succulent plants, which are impatient of moisture in winter, and therefore require for the most part to be kept in a separate stove, and not placed among trees, or herbaceous plants, which perspire freely, and thereby often cause a damp air in the house, which is imbibed by the succulent plants to their no small prejudice. These stoves should be regulated by a thermometer, so as not to over-heat them, nor to let the plants suffer by cold; in order to which, all such plants as require nearly the same degree of heat, should be placed by themselves in a separate house; for if in the same stove there are plants placed of many different countries, which require as many different heats, by making the house warm enough for some plants, others, by having too much heat, are drawn and spoiled.

The other sort of stoves are commonly called bark-stoves, to distinguish them from the dry stoves already mentioned. These have a large pit, nearly the length of the house, three feet deep, and six or seven feet wide, according to the breadth of the house; which pit is filled with fresh tanners bark to make a hot-bed, and in this bed the pots of the most tender exotick trees, and herbaceous plants, are plunged. The heat of this bed being moderate, the roots of the plants are always kept in action, and the moisture, detained by the bark, keeps the fibres of their roots in a ductile state, which in the dry stove, where they are placed on shelves, are subject to dry too fast, to the great injury of the plants. In these stoves, if they are rightly contrived, may be preserved the most tender exotick trees and plants, which, before the use of the bark was introduced, were thought impossible to be kept in *England*; but, as there is some skill required in the structure of both these stoves, I shall not only describe them as intelligibly as possible, but also annex plans of both stoves hereto, by which it is hoped every curious person will be capable of directing his workmen in their structure.

The dimension of these stoves should be proportioned to the number of plants intended to be preserved, or the particular fancy of the owner; but their length should not exceed forty feet, unless there are two fire places, and in that case it will be proper to make a partition of glass in the middle, and to have two tan-pits, that there may be two different degrees of heat for plants from different countries (for the reasons before given in the account of dry stoves); and were I to erect a range of stoves, they should be all built in one, and only divided with glass partitions, at least the half way toward the front, which will be of great advantage to the plants, because they may have the air in each division shifted by sliding the glasses of the partitions, or by opening the glass door, which should be made between each division, for the more easy passage from one to the other.

These stoves should be raised above the level of the ground, in proportion to the dryness of the place; for if they are built on a moist situation, the whole should be

placed upon the top of the ground, so that the brick-work in front must be raised three feet above the surface, which is the depth of the bark-bed, whereby none of the bark will be in danger of lying in water, but, if the soil be dry, the brick-work in front need not be more than one foot above ground, and the pit may be sunk two feet below the surface. Upon the top of this brick-work in front must be laid the plate of timber, into which the wood-work of the frame is to be mortised; this should be of sound Oak without sap, the dimension ten inches wide, and six deep, and the upright timbers in front must be placed four feet asunder, or somewhat more, which is the proportion of the width of the glass-doors or sashes; these should be about eight or nine feet long; their dimension should be ten inches by six, of yellow Fir; from the top of these should be sloping glasses, which should reach within three feet of the back of the stove, where there should be a strong crown piece of timber placed, in which there should be a groove made for the glasses to slide into; the dimension of the sloping timbers should be one foot by nine inches, of yellow Fir, and the crown-plate one foot by nine or ten inches of the same timber. The wall in the back part of the stove should be at least eighteen or twenty-two inches, which is two bricks, or two bricks and a half; for the greater thickness there is in the back wall, the more heat will be thrown to the front, whereby the air of the stove will be better warmed, and the building will be so much stronger, for to this back wall the flues, through which the smoke is to pass, must be joined. This back wall should be carried up about sixteen feet high or more for tall stoves, that they may be of a proper height to support the timbers of the back roof, which covers the shed behind the stove. This roof is fastened into the crown-piece before mentioned, which in tall stoves should be about thirty feet above the surface of the tan-bed, which will give a sufficient declivity to the sloping glasses to carry off the wet, and be of a reasonable height for containing many tall plants. The back roof may be slated, covered with lead, or tiled, according to the fancy of the owner; but the manner of the outside building is better expressed by the annexed plan, than is possible to be described in words.

In the front of the house, before the tan-bed, there should be a walk about two feet wide, for the conveniency of walking; next to which the bark-pit must be placed, which should be in width proportionable to the breadth of the house. If the house is fifteen feet wide, which is a due proportion, the pit may be nine feet wide, and behind the pit should be a walk two feet wide to pass, in order to water the plants, &c. then there will be two feet left next the back wall to erect the flues, which must be all raised above the level of the bark-bed. These flues ought to be one foot wide in the clear, that they may not be too soon stopped with the foot, as also for the more conveniently cleaning them; the lower flue, into which the smoke first enters from the fire, should be two feet and a half deep in the clear; this should be covered with broad tiles, which should be a foot and a half square, that they may be wide enough to extend over the wall in front of the flues, and to take sufficient hold of the back wall; over this the second flue must be returned back again, which may be twenty inches deep, and covered on the top as before, and so in like manner the flues may be returned over each other six or eight times, that the heat may be spent before the smoke passes off. The thickness of the wall in front of these flues need not be more than four inches, but it must be well-jointed with mortar, and pargetered within side to prevent the smoke from getting into the house, and the outside should be faced with mortar, and covered with a coarse cloth, to keep the mortar from cracking, as is practised in setting up coppers.

If this be carefully done, there will be no danger of the smoke entering the house, which cannot be too carefully guarded against; for there is nothing more injurious to plants than smoke, which will cause them to drop their leaves, and, if it continue long in the house, will entirely destroy them.

The fire place must be made at one end, where there is but one; but, if the stove is so long as to require two, they should be placed at each end of the shed, which must be made the length of the stove, that the fires and the back of the flues may not suffer from the outer air, for it will be impossible to make the fires burn equally, where the wind has full ingress to them; and it will be troublesome to attend the fires in wet weather, where they are exposed to the rain.

The contrivance of the furnace must be according to the fuel which is designed to burn, but as turf is the cheapest firing for stoves, where it can be had, many prefer it, because it lasts longer than any other sort of fuel, so requires less attendance. I shall describe a proper sort of furnace for that purpose.

The whole of this furnace should be erected within the house, which will be a great addition to the heat, and the front wall on the outside of the fire place, next the shed, should be three bricks thick, the better to prevent the heat from coming out that way. The door of the furnace, at which the fuel is put in, must be as small as conveniently may be to admit of the fuel; and this door should be placed near the upper part of the furnace, and made to shut as close as possible, so that there may be but little of the heat pass off through it. This furnace should be about twenty inches deep, and sixteen inches square at bottom, but may be sloped off on every side, so as to be two feet square at the top; and under this furnace should be a place for the ashes to fall into, which should be about a foot deep, and as wide as the bottom of the furnace; this should also have an iron door to shut as close as possible, but just over the ash-hole, above the bars which support the fuel, should be a square hole about four or six inches wide to let in air to make the fire burn; this must also have an iron frame, and a door to shut close when the fire is perfectly lighted, which will make the fuel last longer, and the heat will be more moderate.

The top of this furnace should be nearly equal to the top of the bark-bed, that the lowest flue may be above the fire, so that there may be a greater draught for the smoke, and the furnace should be arched over with bricks. The best materials for this purpose are what the bricklayers call *Windfor Bricks*, which should be laid in loam of the same kind as that the bricks are made with; and this, when burnt by fire, will cement the whole together, and become like one brick; but you should be very careful, wherever the fire is placed, that it be not too near the bark-bed, for the heat of the fire will, by its long continuance, dry the bark, so that it will lose its virtue, and be in danger of taking fire; to prevent which, it will be the best method to continue a hollow, between the brick-work of the fire and that of the pit, about eight inches wide, which will effectually prevent any damage arising from the heat of the fire; nor should there be any wood-work placed near the flues, or the fire place, because the continual heat of the stove may in time dry it so much, as to cause it to take fire, which ought to be very carefully guarded against.

The entrance into this stove should be either from a green-house, the dry stove, or else through the shed where the fire is made, because in cold weather the front glasses must not be opened. The inside of the house should be clean white-washed, because the whiter the back part of the house is, the better it will reflect the light, which is of

great consequence to plants, especially in winter, when the stove is obliged to be shut up close.

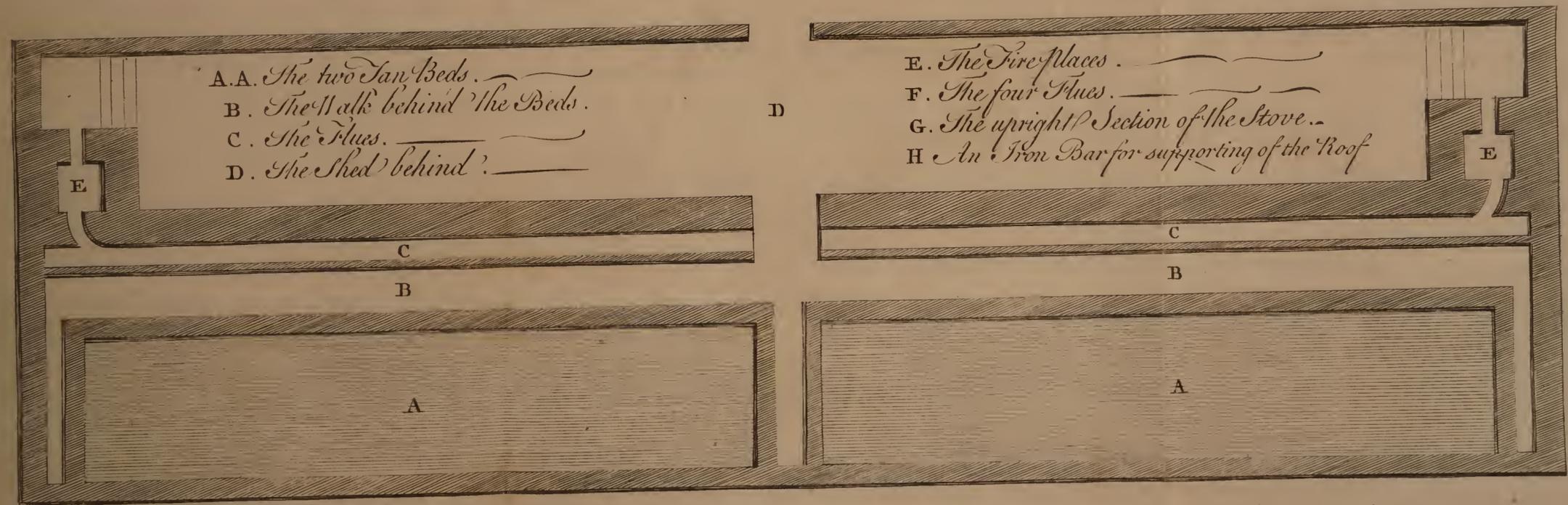
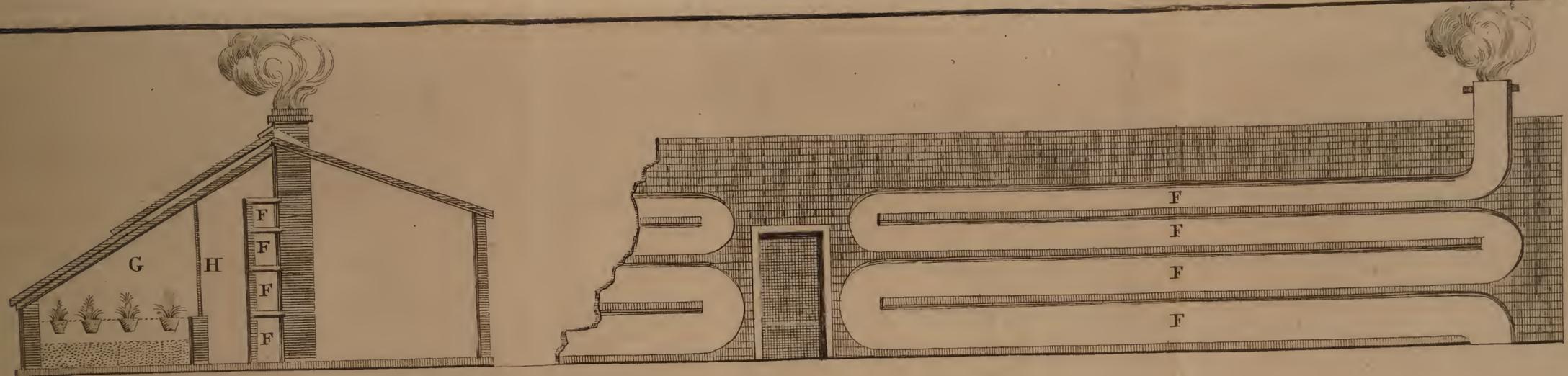
Over the top sliding glasses there should be either wooden shutters, or tarpawlins fixed in frames, to cover them in bad weather, to prevent the wet from getting through the glasses, and to secure them from being broken by storms and hail; and these outer coverings will be very serviceable to keep out the frost; and if in very severe cold there is a tarpawlin hung before the upright glasses in the front, it will be of great service to the stove, and much less fire will preserve a heat in the house.

As in this stove will be placed the plants of the hottest parts of the *East and West-Indies*, the heat should be kept up equal to that marked Anana upon the botanical thermometers, and should never be suffered to be above eight or ten degrees cooler at most; nor should the spirit be raised above ten degrees higher in the thermometer during the winter season, both which extremes will be equally injurious to the plants.

But in order to judge more exactly of the temper of the air in the stove, the thermometer should be hung at a good distance from the fire, nor should the tube be exposed to the sun; but, on the contrary, as much in shade as possible, because, whenever the sun shines upon the ball of the thermometer but one single hour, it will raise the liquor in the tube considerably, when perhaps the air of the house is not near so warm, which many times deceives those who are not aware of this.

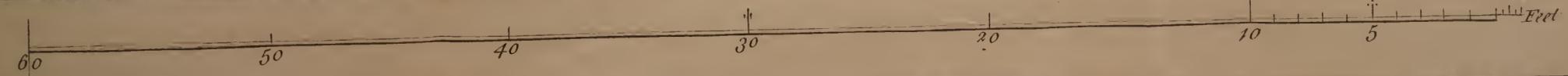
In the management of the plants placed in the bark-bed, there must be a particular regard had to the temper of the bark, and the air of the house, that neither be too violent; as also to water them frequently, but sparingly, in cold weather, because when they are in continual warmth, which will cause them to perspire freely, if they have not a proper supply to answer their discharge, their leaves will decay, and soon fall off. As to the farther directions concerning the culture of the particular plants, the reader is desired to turn to their several articles, where they are distinctly treated of.

The other sort of stove, which is commonly called the dry stove, as was before said, may be either built, with upright and sloping glasses at the top, in the same manner, and after the same model of the bark-stove, which is the most convenient; or else the front glasses, which should run from the floor of the ceiling, may be laid sloping, to an angle of 45 degrees, the better to admit the rays of the sun in spring and autumn. The latter method has been chiefly followed by most persons who have built these sorts of stoves; but were I to have the contrivance of a stove of this kind, I would have it built after the model of the bark-stove, with upright glasses in front, and sloping glasses over them, because this will more easily admit the sun at all the different seasons; for in summer, when the sun is high, the top glasses will admit the rays to shine almost all over the house, and in winter, when the sun is low, the front glasses will admit its rays; whereas, when the glasses are laid to any declivity in one direction, the rays of the sun will not fall directly thereon above a fortnight in autumn; and about the same time in spring, and during the other parts of the year, they will fall obliquely thereon, and in summer, when the sun is high, the rays will not reach above five or six feet from the glasses. Besides, the plants placed toward the back part of the house, will not thrive in the summer season for want of air; whereas, when there are sloping glasses at the top, which run within four feet of the back of the house, these, by being drawn down in hot weather, will let in perpendicular air to all the plants; and of how much service this is to all sorts of plants, every one who has had opportunity of observing the growth of plants



A.A. *The two San Beds.*
 B. *The Walk behind the Beds.*
 C. *The Flues.*
 D. *The Shed behind.*

E. *The Fireplaces.*
 F. *The four Flues.*
 G. *The upright Section of the Stove.*
 H. *An Iron Bar for supporting of the Roof*



in a stove, will easily judge, for when plants are placed under cover of a ceiling, they always turn themselves toward the air and light, and thereby grow crooked; and if, in order to preserve them strait, they are turned every week, they will nevertheless grow weak, and look pale and sickly; for which reasons, I am sure, whoever has made trial of both sorts of stoves, will readily join with me to recommend the model of the bark-stove for every purpose.

As to the farther contrivance of this stove, it will be necessary to observe the temper of the place, whether the situation be dry or wet; if it be dry, then the floor need not be raised above two feet above the level of the ground; but if it be wet, it will be proper to raise it three feet, especially if these flues are to be carried under the floor; for when they are erected close upon the surface of the ground, they will raise a damp, which will prevent the flues drawing so well as when they are more elevated. The furnace of this stove must be placed at one end of the house, according to the directions before given. This must be made according to the fuel intended to burn, which, if for coals or wood, may be made according to the common method for coppers, but only much larger; because, as the fire is to be continued in the night chiefly, if there is not room to contain a proper quantity of fuel, it will occasion a great deal of trouble in tending upon the fire in the night, which should be avoided as much as possible; because, whenever the trouble is made very great or difficult, and the person who is intrusted with the care of it, has not a very great affection for the thing, and is withal not very careful, there will be great hazard of the fire being neglected, which in a little time may be of dangerous consequence to the plants; but, if the fuel intended be turf, then the contrivance of the furnace may be the same as for the bark-stove already mentioned. The flues of this stove, if they are carried under the pavement, may be turned after the following manner,



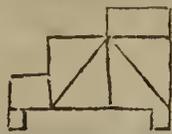
which will cause them to draw better than if strait; and by this method of disposing them, they may be so much turned as to reach from the back to the front of the house.

The depth of them should not be less than eighteen inches, and the width nearly equal, which will prevent their being choked up with soot, as is often the case when the flues are made too small. The spaces between the flues should be filled up either with dry brick rubbish, lime, or sand, from which there will little moisture arise, and the flues should be closely plastered with loam both within and without, and the upper part of them covered with a coarse cloth under the floor, to prevent the smoke from getting into the house.

When the flue is carried from the furnace to the end of the house, it may be returned in the back above the floor twice in strait lines, which may be contrived to appear like a step or two; by which means the smoke will be continued in the house until all its heat is spent, which will consequently warm the air of the house the better; and the chimneys, through which the smoke is to pass off, may be either at both ends, or in the middle, carried up in the thickness of the brick-work of the flues, so as not to appear in sight in the house. The flues should be first covered with broad tiles, and then a bed of sand laid over them about two inches thick, upon which the plain tiles should be laid to correspond with the rest of the floor. This thickness of cover will be full enough to prevent the too sudden rise of the heat from the flues.

But if the furnace is placed under the floor, the thickness of sand between the brick arch which covers it and the

floor, should not be less than four or six inches, so that the bottom of the furnace should be sunk the lower; and if from the fire-place to the end of the house, the flues are laid a little rising, it will cause them to draw the better; but this rise must be allowed in the placing them lower under the floor next the fire, because the floor must be laid perfectly level, otherwise it will appear unsightly.



In this stove there should be a stand or scaffold erected for placing shelves above each other, in the manner annexed, that the plants may be disposed above each other, so as to make a handsome appearance in the house; but these shelves should be made moveable, so as to be raised or sunk, according to the various heights of the plants, otherwise it will be very troublesome to raise or sink every particular plant, according to their heights, or every year as they advance in their growth.

In placing the feet of this stand, you must be careful not to set them too near the fire, nor directly upon the top of the flue, especially that end next the fire, lest by the constant heat of the tiles the wood should take fire, which cannot be too much guarded against, since such an accident would go near to destroy all the plants, if the house escaped being burnt. This stand or scaffold should be placed in the middle of the house, leaving a passage about two feet and a half in the front, and another of the same width in the back, for the more conveniently passing round the plants to water them, and that the air may freely circulate about them. In disposing the plants, the tallest should be placed backward, and the smallest in front, so that there will not be occasion for more than four shelves in height at most; but the scaffold should be so contrived, that there may be two or three shelves in breadth laid upon every rise whenever there may be occasion for it, which will save a deal of trouble in disposing of the plants.

In the erection of these stoves, it will be of great service to join them all together with only glass partitions between them, as was before observed; and where several of these stoves and green-houses are required in one garden, then it will be very proper to have the green-house in the middle, and the stoves at each end, either in the manner directed in the plan of the green-house exhibited in that article, or carried on in one strait front.

By this contrivance in the structure of these houses, a person may pass from one to the other of them, without going to the open air, which, besides the pleasure to the owner, is also of great use, because there will be no occasion of making a back-way into each of them, which otherwise must be, since the front glasses of the stove should not be opened in cold weather, if it can possibly be avoided on any account, otherwise the cold air rushing in, will greatly prejudice the very tender plants.

But besides the stoves here described, and the green-house, it will be very necessary to have a glass case or two, wherever there are great collections of plants. These may be built exactly in the manner already described for the stoves, with upright glasses in front, and sloping glasses over the top of them, which should run within three feet of the back of the house. The height, depth, and other dimensions, should be conformable to that of the stoves, which will make a regularity in the building. These may be placed at the end of the range on each hand beyond the stoves; and if there be a flue carried along round each of these, with an oven to make a fire in very cold weather, it will save a great deal of labour, and prevent the frost from ever entering the house, be the winter ever so severe; but the upper glasses of these houses should have either shutters of wood, or tarpawlin in frames, to cover them in frosty weather; and if there is a contrivance to cover the upright glasses

glasses in frost, either with mats, shutters, or tarpawlines, it will be of great use in winter, otherwise the flue must be used when the frost comes on, which should not be done, but upon extraordinary occasions; because the design of these houses is, to keep such plants as require only to be preserved from frost, and need no additional warmth, but at the same time require more air than can conveniently be given them in a green-house. In one of these houses may be placed all the sorts of *African* Sedums, Cotyledons, and other succulent plants from the *Cape of Good Hope*. In the other may be placed the several kinds of *Arctotis*, *Osteospermum*, *Royena*, *Lotus*, and other woody or herbaceous plants from the same country, or any other in the same latitude.

Thus by contriving the green-house in the middle, and one stove and a glass-case at each end, there will be a conveniency to keep plants from all the different parts of the world, which can be no otherwise maintained but by placing them in different degrees of heat, according to the places of their native growth.

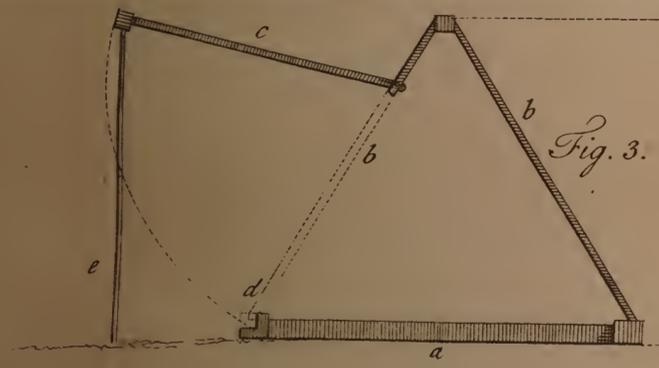
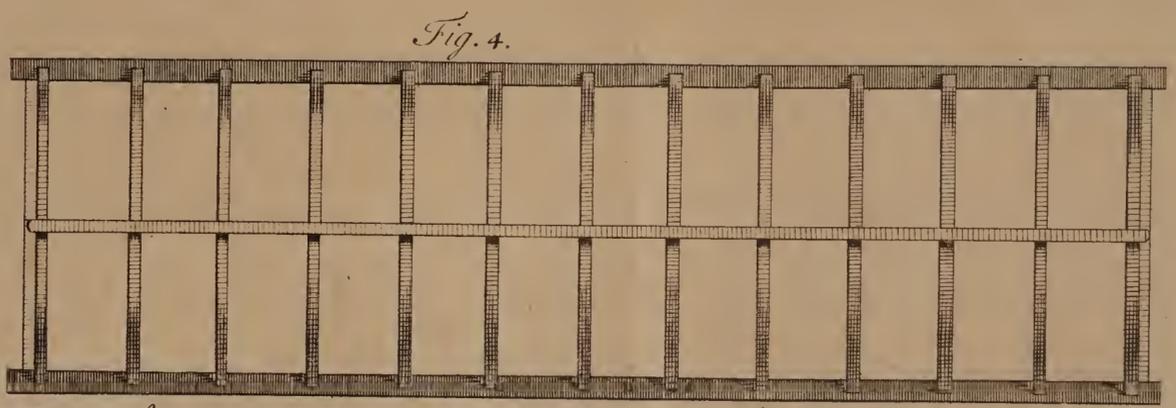
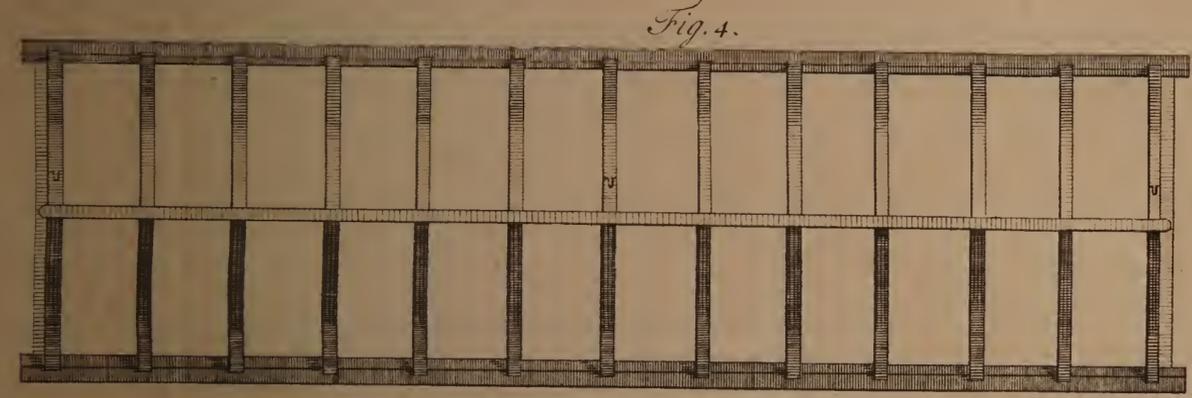
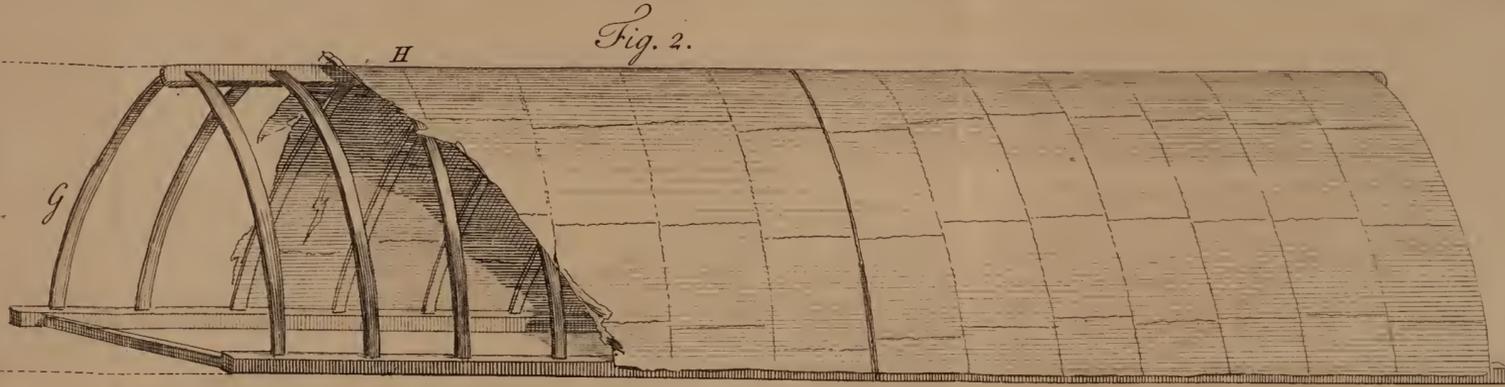
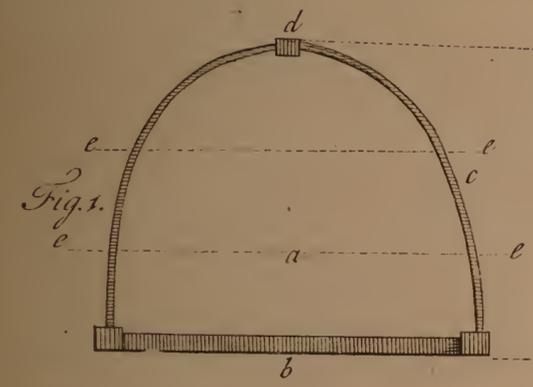
The stoves before described are such as are usually built to maintain exotick plants, which will not live in *England*, unless they enjoy a temperature of air, approaching to that of the several countries from whence they are brought; therefore, whoever is inclinable to preserve a large collection of plants from different countries, must contrive to have two or three of these stoves, each of which should be kept in a different temperature of warmth; and the plants should be also adapted to the several degrees of heat, as they shall require, to preserve them. But as the far greatest number of stoves, which have been erected in *England*, are designed for the culture of the *Ananas* only, so I shall add a description and plans of two sorts of stoves, of the least expence in building for this purpose; so that whoever is inclinable to erect a stove for ripening of the *Ananas*, may, by attending to the plans and descriptions, direct the building and contriving such stoves as they are desirous to have, or according to the number of fruit proposed to be ripened annually.

The first sort of stove is that which is designed for the plants which produce the fruit the same year; for as the plants do not generally fruit, until the second year from their being taken from the old plants, whether they are suckers from the side of the plants, or crowns taken from the fruit, if they fruit the succeeding year, the fruit will be small; therefore, when they are properly managed, they will not produce their fruit until the second year; by which time they will have obtained strength to produce large fruit, in which their greatest value consists; for although there are several varieties of this fruit, which differ in degrees of goodness, as in most other fruits, yet they may all of them be improved in their size, without diminishing of their excellence in taste; though I know there are some persons of a contrary opinion, and who believe, that the small fruit are always better flavoured than the large; but from long experience I can assert, that the larger and better nourished this fruit is, the higher will be its flavour, supposing the sorts are the same; therefore every person who cultivates this fruit, should endeavour to have it improved to the greatest perfection; in order to which it will be proper to have a small stove, in which the young plants may be placed to bring them forward for fruiting, and the following autumn they should be removed into the larger stove for ripening: but I shall return to the description of the larger stove. The length of this must be proportionable to the quantity of fruit desired in one season; for as to their width, that should not be much varied; the tan-bed should never be narrower than six, nor should it be more than eight feet wide, for when it is more, there will be difficulty

in reaching those plants which are in the middle of the bed, to water or clean them; and if there is room enough on each side of the bed for a walk a foot and a half broad, it will be sufficient for persons to water and do every thing which is necessary to the plants; and as these places are not designed for walking in, so it is to no purpose to have broad walks, which will take up too much space; for the fires must be larger, in proportion to the space of the house; otherwise the air cannot be kept in a proper temperature of warmth. If the stove is made thirty-six feet long in the clear, then the tan-bed may be thirty-three feet long, and a walk left at each end a foot and a half wide, which will be sufficient to walk round the bed to water and attend the plants, and such a tan-bed will contain eighty fruiting plants very well; and this stove may be very well warmed with one fire; but if the stove is built much larger, there must be two fire-places contrived, one at each end, otherwise the air of the house cannot be kept in a proper temperature of heat. The quantity of fuel which will be wanting for a stove of thirty-six feet long in the clear, is about three chaldron and a half of coals, or in such proportion for any other sort of fuel; when coals can be had reasonable it is the best kind of fuel; and the pit or *Scotch* coal is preferable to the *Newcastle* coal, because the latter is very subject to melt or run into clinkers, when the oven is very hot, which the pit coal never does, but always burns away with a white ash, making but little soot; so that the flues will not require to be so often cleaned, as when the other coal is used. The next best fuel for stoves is Peat, where it can be procured good; but the scent of this fuel is disagreeable to many people. There are some persons who burn wood in their stoves; but this fuel requires much greater attendance than any other, therefore is not very proper for this purpose; but in the building of the stoves, the ovens must be contrived for the sort of fuel which is to be used in them; but these will be afterward described, and the places where they should be situated, are delineated in the plan.

The stoves designed for ripening the fruit of the *Ananas*, should have upright glasses in their front, which should be high enough to admit a person to walk upright under them on the walk in the front of the house; or where this cannot be admitted, the front walk may be sunk one foot lower than that on the back of the tan-bed, so that the surface of the bed will be a foot above the walk, which will be rather an advantage, as the plants will be so much nearer the glass; and a person may with great ease water and attend the plants, when they are thus raised above the walk; therefore, when a stove is so situated, as that the raising of it high above ground, might be attended with inconvenience, the walks quite round the tan-bed may be sunk a foot or eighteen inches below the top of the bed, which will admit of the stove being built so much lower; for if there is height for a person to walk under the glasses, it will be as much as is required; but as the flues, when returned four times against the back wall, will rise near seven feet, so the bottom of the lower flue should be on the same level with the walk, to admit room enough for the whole under the roof. Over the upright glasses there must be a range of sloping glasses, which must run to join the roof, which should come so far from the back wall as to cover the flues, and the walk behind the tan-pit; for if the sloping glasses are of length sufficient to reach nearly over the bed, the plants will require no more light, therefore these glasses should not be longer than is absolutely necessary, which will render them more manageable; but the annexed plan will render this more intelligible than any written description can do.

Two Sorts of Frames with oyled Paper for Covering Melons.



The other sort of stove, which is designed for raising of young plants, until they are of a proper size to produce fruit, need not be built so high as the former; therefore there will not be wanting any upright glasses in the front, but the frames may be made in one slope, as in the annexed plan; indeed of late years, many persons have made tan-beds, with two flues running through the back wall, to warm the air in winter; and these beds have been covered with glasses, made in the same manner as those for common hot-beds, but larger; these were contrived to save expence, and have in many places answered the intention; but to these there are several objections. 1. That of having no passage into them, so that the glasses must be taken off, when the plants want water, &c. 2. The damps very often rise in the winter season, when the glasses are closely shut, which often proves very injurious to the plants. 3. There is danger of the tan taking fire, where there is not great care taken that it doth not lie near the flues; so that although the small stoves here proposed require more expence in their building, yet, being greatly preferable to those pits, and the after expence being the same, they will be found so much more convenient as to render them more general where this fruit is cultivated.

Where there is no danger of the wet settling about the tan in winter, the bark-pit may be sunk two feet deep in the ground, and raised one foot above the surface; the only walk which is necessary in these stoves, is that on the back of the tan-bed, which may be on the level with the surface of the ground; so that the tan-bed will be more than one foot above the walk, and the flues beginning from the level of the walk, there will be room to return them three times, which will warm the air much more with the same fire, than when they are carried but twice the length of the stove.

But in wet land the tan-bed should be wholly raised above the level of the ground, in order to preserve the tan from being chilled by moisture; and in such places the walk on the back should be raised near two feet above the level of the ground, because the tan-bed should not rise much more than one foot above the walk; for if it is higher, it will be more difficult to reach the plants when they require water; the brick wall of the pit, on the side next the walk, need not be more than four inches thick, so far as rises above the walk, but below that it should be nine inches thick. The reason for reducing the wall above, is to gain room for the walk, which would otherwise be too much contracted; and if there is a kirb of Oak laid on the top of the four inch wall, it will secure the bricks from being displaced, and sufficiently strengthen the wall, which being but one foot above the walk, will not be in any danger of falling; and on this kirb there may be two or three upright iron bars fixed with claws, to support the crown-piece of timber, which will secure it from hanging in the middle, which in a great length is very often the case, where there are no supports placed under it; there may be more or less of these bars according to the length of the stove, but if they are about ten feet asunder, it will be near enough. If these iron bars are one inch square, they will be strong enough to answer the design.

But as it is hoped that the annexed plan of this small stove will convey a clear idea of the whole contrivance, this will render it unnecessary to add any farther description here.

An explanation of the plate which represents the two sorts of frames with oiled paper for covering of Melons.

The first of these frames is contrived like the covers of waggons; it has a frame of wood at the base, to which are

fastened broad hoops, which are bent over circularly, as is represented at Fig. 1. The width of this frame should be from five to six feet, for less than five feet will not be sufficient to cover the bed; and if they are more than six feet broad, they will be too heavy and troublesome to move. *a* Shews the section of the width, *b* the frame of wood at the base, *c* the arch of hoops, and *d* a small slip of wood, which is fastened to the under side of the hoops to keep them in their proper position.

The distance between each hoop should not be more than one foot, and there should be two rows of strong pack-thread or rope-yarn on each side of the arch running from hoop to hoop at the places marked, *e. e. e. e.* to keep the oiled paper from sinking down with wet. The length of each frame should not be much more than ten feet, which will be sufficient length for covering three plants, that being about the size of a three light frame, for if they are longer, they will be heavy and troublesome to move; therefore there should be as many of these frames made, as may be necessary for covering the quantity of plants designed. Fig. 2. Represents two lengths of these frames joined, *G.* shews the profile of the frame, and *H.* represents the paper turned back, that it may be seen how it is laid over the frame.

Fig. 3. Represents the other sort of frame which is contrived like the roof of a house, *a* shews a section of the base; *b b* the two slopes, *c* one of the sides which is contrived to be raised at any time to admit air to the plants, *d* shews the place where this shuts down, and *e* the prop which supports it. If in the making of these frames every other light is made with hinges so as to be raised, and on the opposite side they are contrived to rise alternately, it will be a very good method, for then air may be given at the side contrary to the wind; and in very warm weather, when the plants require a large share of air, they may all be raised on both sides, which will make a thorough air to the whole bed. Fig. 4. Shews the plain of these frames; and Fig. 5. the same erected; *g* represents the profile of it, and *f* the covering of paper. This sort of frame may be made of pantile laths, or of slips of deal of like dimensions, because they should not be too heavy; but the base of the frame to which these are fastened, should be more substantial. Some persons who have made trial of both, recommend the latter for the convenience of giving air to the plants, for there is no other contrivance in the first sort for admitting the air, but by raising the whole frame on one side in proportion to the quantity of air intended to be admitted, and when the season is warm, they generally raise those frames on both sides, and permit the plants to run out from under them.

When these frames are made, if they are well painted over with the following composition, it will greatly preserve them, *viz.* To every six pounds of melted pitch, add half a pint of Linseed oil, and a pound of brick-dust; these should be well mixed together, and used warm; when this dries it becomes a hard cement, so that no moisture can penetrate through it, and is the best sort of pigment for all timber exposed to the weather, I have ever seen used; so that where the colour is not offensive to the sight, it should be preferred to every other.

When the frames are thoroughly dry, the paper should be pasted on to the frames. The best sort of paper for this purpose, is what they call *Dutch Wrapper*; this is strong, and when oiled over becomes pellucid, so admits the rays of light through it extremely well. After the paste is well dried, the paper should be oiled over on the outside, which, if well done with Linseed oil, will be sufficient, for the oil will soak quite through the paper, so there will be no necessity for oiling both sides, nor for doing it over more than

once. The oil should be dry before the frames are exposed to the wet, otherwise the paper will tear. In the pasting of the paper on the frames, there should be care taken to stretch it very smooth, and also to paste it to all the ribs of the frames, and also to the packthreads, to prevent the wind from raising the paper, which would soon tear it, when it became loose.

The above description, together with the annexed plan, it is hoped, will be sufficient instructions for any one who is desirous of making these covers; and what has been before mentioned under the article MELON, will be directions enough for the use of them; so that I shall only add one caution which may be necessary to repeat here, which is, not to keep these covers too close down over the plants, lest it draw them too weak, so that air should always be admitted to the plants at all times in proportion to the warmth of the season.

These covers of oiled paper are not only useful for covering of Melons, but are the best things to cover cuttings of exotick plants, when planted, that can be contrived; and are also capable of being used for many other purposes.

The paper will seldom last longer than one season, so it will require a new covering every spring; but if the frames are well made, and when they are out of use, laid up in shelter from the wet, they will last several years, especially if there is a band of Straw laid round the Melon bed, upon which the frames may stand, so they will not rest upon the ground, and the Straw-bands will prevent the damp from rising so as to rot them. These Straw-bands are such as are recommended for the hot-beds of Asparagus in winter.

STRAMONIUM. See Datura.

STRATIOTES. *Lin. Gen. Plant.* 607. Water Soldier.

The Characters are,

It has one flower, inclosed in a compressed obtuse sheath, composed of two leaves, which are keel shaped and permanent. The empalement of the flower is of one leaf, trifid, and erect. It has three almost heart-shaped petals, which are twice the size of the empalement, and about twenty stamina inserted in the receptacle of the flower, terminated by single summits. The germen is situated under the empalement, supporting six styles, divided in two parts, crowned by single stigmas. The germen afterward becomes an oval capsule, narrowed on every side, having six angles, and as many cells, filled with oblong incurved seeds.

We know but one Species of this genus, viz.

STRATIOTES. *Lin. Flor. Lapp.* 222. Water Soldier, Water Aloe, or Fresh Water Soldier.

This plant is in shape like the Aloe, but the leaves are thinner, and serrated on the edges very sharply; they are of a grayish colour, and about a foot long; between the leaves from the center of the plant arise one, two, and sometimes three stalks, almost the length of the leaves, each being terminated by a three-forked sheath, out of which bursts one white flower, composed of three roundish heart shaped petals, with many yellow stamina in the middle. Below the flower is situated a conical germen, which is reversed, the broad end standing upward, and the narrow downward. This becomes a six-angled capsule, having six cells, filled with seeds. It grows plentifully in standing waters in the *Ile of Ely*, and many places in the north of *England*, from whence young plants may be procured in spring, when they first rise on the surface of the water; and these being placed in large ponds or canals, will strike down their roots, and propagate without any farther care. In autumn the plants sink down to the bottom of the water, and rise again in the spring.

STRAWBERRY. See *Fragaria*.

STRAWBERRY-TREE. See *Arbutus*.

STYRAX. *Tourn. Inst. R. H.* 598. *tab.* 369. Storax-tree.

The Characters are,

The flower has a short cylindrical empalement, indented in five parts; it has one funnel-shaped petal, with a short cylindrical tube, whose brim is cut into five large obtuse segments, which spread open; it has ten or twelve awl-shaped stamina, disposed circularly, inserted in the petals, and terminated by oblong summits; and a roundish germen, supporting a single style the length of the stamina, crowned by a ragged stigma. The germen afterward turns to a roundish fruit with one cell, including two nuts, which are plain on one side, and convex on the other.

We know but one Species of this genus, viz.

STYRAX. *Hort. Cliff.* 187. The Storax-tree.

This plant grows plentifully in the neighbourhood of *Rome*, and also in *Palestine*, and several of the islands in the *Archipelago*, from whence the fruit has been brought to *England*, where there have been many plants raised of late years in some curious gardens.

It has a woody stalk, which rises twelve or fourteen feet high, covered with a smooth grayish bark, sending out many slender ligneous branches, garnished with oval leaves, shaped like those of the Quince-tree, of a bright green on their upper side, but hoary on their under, placed alternately on short foot-stalks. The flowers come out from the side of the branches upon foot-stalks, which sustain five or six flowers in a bunch; these have one very white petal, which is funnel-shaped, the lower part being tubulous and cylindrical, and the upper divided into five obtuse segments, which spread open, but not flat, rather inclining to an angle. These are often succeeded by berries in *England*.

It may be propagated by sowing the seeds in pots, filled with fresh light earth, and plunged into a moderate hot-bed. If they are sown the latter end of summer, and the pots kept in a moderate hot-bed of tanners bark all the winter, the plants will come up the succeeding spring; whereas those sown in the spring, often remain in the ground a whole year before the plants come up.

When the plants are come up, they should be hardened gradually to the open air, into which they should be removed in *June*, placing them in a sheltered situation, observing to keep them clean from weeds, as also to supply them with water duly in dry weather. In this place they may remain till autumn, when they should be placed under a common hot-bed frame, where they may be screened from hard frost in winter, but in mild weather enjoy the free air as much as possible; for if they are kept too close, their tops are very subject to grow mouldy. The leaves of these plants fall off in autumn, and in the spring, before they begin to shoot, they should be shaken out of the pots, and their roots carefully parted, and each transplanted into a separate small pot, and plunged into a very moderate hot bed, observing to water and shade them until they have taken root; after which they should be inured to the open air by degrees, into which they must be removed in *June*, placing them in a warm situation; in which place they may remain till the end of *October*, at which time they should be removed into shelter for the winter season. These plants are tolerably hardy, and only require to be sheltered from severe frost while they are young, for in *Italy* they grow extremely well in the open air, and produce fruit in great plenty. When the plants have grown three or four years in pots, and are become strong, some of them may be turned out of the pots, and planted in the full ground, against a wall to the south aspect, to which their branches should be trained, in the same manner as is practised with fruit-trees; in which situation they will bear the cold of our winters very well, but in very severe frost it will be proper to cover the branches either with mats, Straw, or other light covering to protect them. With this care

care the plants will flower annually, and in warm seasons ripen their seeds.

The gum of this tree is used in medicine, which is obtained by making incisions in the tree. It is brought from *Turkey*, but it is so adulterated by mixing saw-dust or other stuff with it, that it is very difficult to meet with any that is pure. It has a most pleasant fragrant odour; it is called *Styrax Calamita*, because it was transported in hollow canes.

Of late years there has been another species of *Storax* imported here from *North America*, which is collected from the liquid Amber tree. This has been titled *Liquid Storax* by some, but is very different from that which is brought from *Turkey*, and is clear, inclining to yellow; it is brought sometimes liquid, and at others it is dried in the sun to a concrete resin before it is transported.

SUBER. See *Quercus*.

SUCCORY. See *Cichorium*.

SUMACH. See *Rhus*.

SURIANA. *Plum. Nov. Gen. 37. tab. 40.*

The Characters are,

The empalement of the flower is permanent, composed of five spear-shaped small leaves. The flower has five oval petals the length of the empalement, which spread open; it has five slender stamina, which are shorter than the petals, terminated by single summits, and five roundish germen, supporting a slender style the length of the stamina, which is inserted in the middle to the side of the germen, crowned with an obtuse stigma. The germen afterward becomes five roundish seeds joined together.

We know but one Species of this genus, viz.

SURIANA. *Hort. Cliff. 492. Suriana.*

This plant grows naturally by the sea side in most of the islands of the *West-Indies*, where it rises with a thick shrubby stalk eight or nine feet high, covered with a dark brown bark, dividing into branches; the upper part of which are closely garnished with leaves on every side, standing without order; they are rounded at their points, and sit close to the branches, having no foot-stalks, and of a dirty green colour. From between the leaves come out the foot-stalks of the flowers, which are about an inch long; these do each sustain two, three, or four yellow flowers, which have some four, and others five petals, rounded at their points, and almost heart-shaped; these are succeeded by roundish seeds, which are joined together, sitting in the empalement. Some flowers have two, others three, four, or five seeds to each.

It is propagated by seeds, which must be sown on a hot-bed early in the spring; and when the plants are come up, they must be carefully cleared from weeds, and frequently refreshed with water. In warm weather the glasses of the hot-bed should be raised every day, to admit fresh air to the plants, to prevent their drawing up too weak. When the plants are fit to remove, they should be taken up carefully, and each planted in a separate small pot, and plunged into a hot-bed of tanners bark, observing to shade them until they have taken new root; after which they must have fresh air admitted to them every day, in proportion to the warmth of the season. In this hot-bed the plants may remain till autumn, when the nights begin to be cold; at which time they should be removed into the stove, and plunged into the bark-bed. During the winter season these plants must be kept very warm, especially while they are young, otherwise they will not live through the winter in this country. They must also be frequently refreshed with water; but it must not be given to them in large quantities in cold weather, for too much moisture in winter will soon destroy them. These plants make but slow progress the first year; afterwards they will grow pretty freely, if they are not stinted. In summer they must have a large share air, by opening the glasses of the stoves; and if their

leaves are covered with filth (which the plants in stoves often contract), they should be carefully washed with a sponge, otherwise the plants will not only appear unsightly, but it will retard their growth.

SYCAMORE. See *Acer majus*.

SYMPHYTUM. *Tourn. Inst. R. H. 138. tab. 56. Comfrey.*

The Characters are,

The flower has a five-cornered, erect, permanent empalement, cut into five acute parts; it has one petal with a short tube, above which the limb has a swelling belly and thicker tube; the brim is indented in five obtuse parts, which are reflexed; the chaps are armed with five awl shaped rays, which are connected in a cone; it has five awl-shaped stamina, which are alternate with the rays of the chaps, terminated by erect acute summits, and four germen, supporting a slender style the length of the petal, crowned by a single stigma. The germen afterward turns to four gibbous acute-pointed seeds, which ripen in the empalement.

The Species are,

1. SYMPHYTUM *foliis ovato-lanceolatis decurrentibus. Hort. Cliff. 47.* Comfrey with oval, spear-shaped, running leaves; Comfrey with a purple flower.

2. SYMPHYTUM *foliis summis oppositis. Lin. Sp. Plant. 136.* Comfrey with the upper leaves placed opposite.

3. SYMPHYTUM *foliis ovatis subpetiolatis. Lin. Sp. Plant. 136.* Comfrey with oval leaves and short foot-stalks.

There are several other species of this genus, but those which are here enumerated, are all the sorts at present to be found in the *English* gardens.

The first sort grows naturally in *England*, but the most common here is that with a whitish yellow flower, which is found growing by the side of ditches and other moist places in great plenty, but that with purple flowers is the most common in *Holland* and *Germany*; these are supposed to be accidental varieties, which differ in the colour of their flowers; however, this difference is permanent in the plants raised from seeds, as I have many times found; nor are the two kinds ever found mixed where they grow wild, for in those places where the blue is found, the white is never seen, and vice versa: but as there are no specific differences between them, I shall not separate them.

The common Comfrey has thick roots, composed of many fleshy fibres or fangs, which run deep in the ground; they are black on the outside, but white within, full of a slimy tenacious juice. The lower leaves are large, long, sharp-pointed, hairy, and rough. The stalks rise two feet high, which are garnished with oval spear-shaped leaves, ending in acute points; they are hairy, rough, and from their base runs a leafy border along the stalk. From the upper part of the stalk are sent out some side branches, which are commonly garnished with two smaller leaves, and are terminated by loose bunches of flowers, which are reflexed; each flower has one tubulous petal, whose upper petal is bellied and thicker than the lower, and the chaps are closed by the stamina and rays, which cross it, and shuts up the tube. These in the common *English* sort are of a yellowish white, and the foreign one is of a purple colour.

The second sort grows naturally in *Germany*. The roots of this are composed of many thick fleshy knobs or tubers, which are joined by fleshy fibres; the stalks incline on one side; they rise a foot and a half high; the leaves on the lower part are six inches long and two and a half broad in the middle, ending in acute points, and are not so rough and hairy as those of the other species; they are placed alternate, and sit close to the stalks. The two upper leaves on every branch stand opposite, and just above them are loose spikes or bunches of pale yellow flowers, whose petals are stretched out farther beyond the empalement than those of the other.

The third sort grows naturally on the side of rivers near *Constantinople*; this has a perennial root like the first; the stalks grow two feet high; the leaves are rounder, and are armed with rough prickly hairs. The flowers are blue, and grow in bunches like those of the first sort.

These plants may be cultivated either by sowing their seeds in the spring, or by parting of their roots; the latter way being the more expeditious, is chiefly practised, where they are planted for use. The best season for parting the roots is in autumn, at which time almost every piece of a root will grow. They should be planted about two feet and a half asunder, that they may have room to spread, and will require no farther care but to keep them clear from weeds, for they are extremely hardy, and will grow upon almost any soil or in any situation.

SYRINGA. *Lin. Gen. Plant.* 22. Lilac.

The Characters are,

The flower has a small, tubulous, permanent empalement of one leaf, indented in four parts; it has one petal, with a long cylindrical tube, cut into four obtuse segments at the brim, which spread open, and two very short stamina, terminated by small summits, standing within the tube; it has an oblong germen, supporting a short slender style, crowned by a thick bifid stigma. The germen afterward turns to an oblong, compressed, acute-pointed capsule, with two cells, opening with two valves contrary to the partition, including in each cell one oblong acute-pointed seed, with a membranaceous border.

The Species are,

1. SYRINGA *foliis ovato-cordatis*. *Hort. Cliff.* 6. Syringa with oval heart-shaped leaves; or blue Lilac.
2. SYRINGA *foliis lanceolatis*. *Lin. Sp. Plant.* 9. Syringa with spear-shaped leaves; commonly called *Persian Jasmine*.
3. SYRINGA *foliis lanceolatis integris dissectisque laciniata*. *Hort. Cliff.* 6. Syringa with entire spear-shaped leaves, and others which are cut and jagged; commonly called cut-leaved *Persian Jasmine*.

The first sort is very common in the *English* gardens, where it has been long cultivated as a flowering shrub. It is supposed to grow naturally in some parts of *Persia*, but is so hardy as to resist the greatest cold of this country. There are three varieties of this shrub, which are commonly cultivated in the *English* gardens, which differ in the colour of their flowers, and also in that of their shoots and leaves; one of these has white flowers, one blue, and the third has purple flowers; the latter is commonly known by the title of *Scotch Lilac*, to distinguish it from the other. This is the most beautiful of the three, and is probably called the *Scotch Lilac*, because it was first mentioned in the Catalogue of the *Edinburgh* garden. Whether this was raised from seeds, or which other way it was obtained, I could never learn; but I take it to be a distinct species from the others, though there is not marks enough upon them to distinguish their specific differences, because I have raised many of the plants from seeds, which have always retained their difference; as have also the white, when they were propagated by seeds, so that they may be rather esteemed as distinct sorts, although by the rules now admitted for determining specific differences, they may not have sufficient marks whereby to distinguish them; and as they have been by most of the modern botanists joined together, I shall not separate them again, but shall mention the particulars in which they differ.

These shrubs grow to the height of eighteen or twenty feet in good ground, and divide into many branches; those of the white sort grow more erect than the other, and the purple or *Scotch Lilac* has its branches more diffused than either. The branches of the white are covered with a smooth bark, of a gray colour; those of the other two are darker. The leaves of the white are of a very bright green,

but those of the other are of a dark green; their shape and size are so near as not to be distinguished thereby. They are heart-shaped, and are placed opposite. The buds of the future shoots, which are very turgid before the leaves fall, are of a very bright green in the white sort, but those of the other two are of a dark green. The flowers are always produced at the ends of the shoots of the former year, and below the flowers come out shoots to succeed them; for that part upon which the flowers stand, decays down to the shoots below every winter. There are generally two bunches or panicles of flowers joined at the end of each shoot; those of the blue are the smallest, and are placed thinner than either of the other. The bunches on the white are larger; the flowers are closer placed, and larger than the blue; but those of the *Scotch* are larger, and the flowers are fairer than those of either of the other, so make a much finer appearance. The panicles of flowers grow erect, and being intermixed with the fine green leaves, have a fine effect; and if we add to this the fragrantcy of their flowers, it may be ranged among the most beautiful shrubs which now decorate the *English* gardens. They flower in *May*, and when the season is cool, these shrubs will continue three weeks in beauty, but in hot seasons the flowers soon fade. Their seeds are ripe in *September*, which, if sown soon after, the plants will come up the following spring; but as their roots send out great plenty of suckers annually, so few persons ever take the trouble to propagate these plants by seeds. I have raised several plants of the three sorts from seeds, and constantly found them prove the same as the shrubs from which the seeds were taken. These plants do generally flower the third year from seed; and I have always found these plants not so apt to send out suckers, as those which were produced by suckers, so are much more valuable, for the others put out such plenty of suckers, as that if they are not annually taken from the plants, they will starve them.

These plants thrive best upon a light rich soil, such as the gardens near *London* are for the most part composed of; and there they grow to a much larger size, where they are permitted to stand unremoved than in any other part of *England*, for in strong loam, or upon chalky land, they make little progress. If the suckers are small, when they are taken from the old plants, they should be planted in a nursery, in rows three feet asunder, and one foot distance in the rows, where they may stand a year or two to get strength, and then they should be removed to the places where they are to remain. The best time to transplant these shrubs is in autumn.

There is a variety or two of these shrubs with blotched leaves, which some persons are fond of; but as these variations are the effect of weakness, so whenever the shrubs become healthy, their verdure returns again.

The second sort grows naturally in *Persia*, but has been long cultivated in the *English* gardens, where it is best known among the gardeners by the title of *Persian Jasmine*. This is a shrub of much lower growth than the former, seldom rising more than six or eight feet high. The stalks of this shrub are woody, covered with a smooth brown bark; the branches are slender, pliable, and extend wide on every side; these frequently bend downward where they are not supported; they are garnished with narrow spear-shaped leaves, placed opposite, of a deep green colour, ending in acute points. The flowers are produced in large panicles at the end of the former year's shoots, in like manner as the former; they are of a pale purple colour, and have a very agreeable odour. These appear the latter end of *May*, soon after those of the common sort, and continue longer in beauty; but these do not perfect their seeds in *England*.

There is a variety of this with almost white flowers, which has of late years been obtained; but whether it came from seeds, or was accidentally produced by suckers from the purple kind, I cannot say.

The third sort differs from the second in having two sorts of leaves; those on the lower part of the branches are for the most part entire; these are broader and shorter than those of the second, and do not end in so sharp points. The leaves on the younger branches are cut into three or five segments, like winged leaves almost to the midrib. The branches of this sort are slenderer and weaker than those of the second; their bark is of a darker brown, and the flowers of a brighter purple colour.

This was brought into *Europe* before the other, and came by the *Persian* title *Agem*. Both these sorts are usually propagated by suckers, which their roots send out in great plenty; these should be carefully taken off from the old plants in the autumn, and planted in a nursery in the same manner as is before directed for the first, where they may grow two years to get strength, and may then be transplanted to the places where they are designed to remain. The plants which are so propagated, are always very prolific in suckers; for which reason it will be a better way to raise them by laying down their young branches, which in one year will be sufficiently rooted to transplant, and may then be treated in the same way as the suckers.

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TABERNÆMONTANA. *Plum. Gen. Nov. 18. tab. 30.*

The Characters are,

The flower has a small empalement, cut into five acute parts; it has one funnel-shaped petal, with a long cylindrical tube, which is bellied at both ends, and at the brim is cut into five oblique segments; it has five small stamina in the middle of the tube terminated by summits which join together, and two germen, supporting an awl-shaped style, crowned by decayed stigmas. The germen afterward turns to two bellied capsules, which are horizontally reflexed, opening with one valve, having one cell, filled with oblong oval seeds, lying imbricatum, and surrounded with pulp.

The Species are,

1. TABERNÆMONTANA *foliis lanceolatis oppositis, floribus corymbosis lateralibus*. Tabernæmontana with spear-shaped leaves, which are placed opposite, and flowers growing in a corymbus on the sides of the branches.

2. TABERNÆMONTANA *foliis oblongo-ovatis acuminatis oppositis, floribus corymbosis terminalibus*. Tabernæmontana with oblong, oval, acute pointed leaves, which are placed opposite, and flowers growing in a corymbus, terminating the branches.

The first sort grows naturally in *Jamaica*, and some of the other islands in the *West-Indies*. Sir *Hans Sloane* has figured it in his *History of Jamaica*, under the title of *Nerium arboreum folio latiore obtuso, flore luteo minore. Tab. 186. f. 2.* Tree-like *Nerium* with a broader obtuse leaf, and a smaller yellow flower.

This rises with an upright woody stalk to the height of fifteen or sixteen feet, covered with a smooth gray bark, which abounds with a milky juice, and sends out several branches from the side, which grow erect, garnished with thick leaves, which have a milky juice, of a lucid green, and have many transverse veins from the midrib to the border, standing opposite on foot-stalks an inch long. The flowers come out in roundish bunches from the wings of the stalk; they are small, of a bright yellow colour, and have an agreeable odour. The tube of the flower is half an inch long; the brim is cut into five acute points, which spread open like those of the common *Jasmine*. These flowers,

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in their native soil, are succeeded by two swelling capsules, joined at their base, but spread from each other horizontally, and are filled with oblong seeds, lying over each other like the scales of fish, and are included in a soft pulp.

The second sort was discovered by the late *Dr. William Houfoun* in the year 1730, growing naturally at *La Vera Cruz*. This rises with a woody stalk ten or twelve feet high, covered with a wrinkled gray bark, sending out many branches toward the top, which are garnished with oblong oval leaves, of a lucid green, and of a thick consistence; they are five inches long, and two and a half broad, rounded at both ends, but terminate with an acute point. These are placed opposite, and have short foot-stalks. The flowers come out in pretty large roundish bunches at the end of the branches; they are white, and smaller than those of the first sort, having an agreeable scent. These are succeeded by shorter and rounder pods, which spread from each other horizontally like the former.

Both these plants are very impatient of cold, so will not live in this country, unless they are placed in a warm stove. They may be propagated by seeds or cuttings; if by seeds, they may be procured from the countries where the plants grow naturally; these should be sown early in the spring on a hot-bed, and when the plants are come up, they must be carefully transplanted into small pots, filled with light rich earth, and plunged into a hot-bed of tanners bark, being careful to shade them in the heat of the day, until they have taken new root; after which time they must have free air admitted to them every day when the weather is warm; but if the nights should prove cold, the glasses of the hot-bed should be covered with mats every evening, soon after the sun goes off from the bed. These plants must be often refreshed with water, but it must not be given to them in large quantities, especially while they are young, for as they are full of a milky juice, they are very subject to rot with much moisture.

The plants may remain during the summer season in the hot-bed, provided the tan is stirred up to renew the heat when it wants, and a little new tan added; but at *Michaelmas*, when the nights begin to be cold, the plants should be removed, and plunged into the bark-bed in the stove; where,

where, during the winter season, they must be kept in a moderate degree of warmth, and in cold weather they should have but little water given them. As these plants are too tender to live in the open air in this country, they should constantly remain in the stove, where, in warm weather they may have free air admitted to them, by opening the glasses, but in cold weather they must be kept warm. With this management the plants will thrive and produce their flowers; and as their leaves are always green, they will make a pleasant diversity amongst other tender exotick plants in the stove.

These plants may also be propagated by cuttings during the summer season, which should be cut off from the old plants, and laid to dry in the stove five or six days before they are planted, that the wounded parts may heal, otherwise they will rot. These cuttings should be planted in pots filled with fresh light earth, and plunged into the hot-bed of tanners bark, and closely covered with a hand-glass, observing to shade them from the sun in the middle of the day in hot weather, as also to refresh them now and then with a little water. When the cuttings have taken root, they may be transplanted into separate pots, and treated in the same manner as those which are raised from seeds.

TACAMAHACA. See Populus.

TAGETES. *Tourn. Inst. R. H.* 478. *tab.* 278. *African*, or *French Marigold*.

The Characters are,

The common empalement of the flower is single, oblong, erect, and five-cornered; the flower is compound and radiated; the ray or border is composed of five female half florets, which are tongue-shaped. The disk or middle is made up of hermaphrodite florets, which are tubulous, cut into five obtuse segments; these have five short hair-like stamina, terminated by cylindrical summits, and an oblong germen, supporting a slender style, crowned by a bifid reflexed stigma. The germen afterward becomes a single, linear, compressed seed, almost the length of the empalement, crowned by five acute-pointed unequal scales.

The Species are,

1. TAGETES caule simplici erecto, pedunculis nudis unifloris. *Hort. Cliff.* 418. Tagetes with a single erect stalk, and naked foot-stalks bearing one flower; or upright *African Marigold*.

2. TAGETES caule subdiviso diffuso. *Hort. Cliff.* 418. Tagetes with a diffused subdivided stalk; commonly called *French Marigold*.

3. TAGETES caule simplici erecto, pedunculis squamosis multifloris. *Hort. Cliff.* 419. Tagetes with a single erect stalk, and scaly foot-stalks bearing many flowers.

4. TAGETES caule simplici erecto, foliis cordatis simplicibus, pedunculis nudis unifloris. Tagetes with a single stalk, simple heart-shaped leaves, and naked foot-stalks, having one flower.

The first sort grows naturally in *Mexico*, but has been long cultivated in the *English* gardens, where it is commonly titled *African*, or *African Marigold*; of this there are the following varieties:

1. Pale yellow, or brimstone colour, with single, double, and fistulous flowers.

2. Deep yellow, with single, double, and fistulous flowers.

3. Orange-coloured, with single, double, and fistulous flowers.

4. Middling *African*, with Orange-coloured flowers.

5. Sweet-scented *African*.

These are all very subject to vary, so that unless the seeds are very carefully saved from the finest flowers, they are very apt to degenerate; nor should their seeds be too long sown in the same garden without changing it, for the same reason; therefore, those who are desirous to have these flowers in perfection, should exchange their seeds with some

person of integrity at a distance where the soil is of a different nature, at least every other year. If this is done, the varieties may be continued in perfection.

This plant is so well known as to need no description. It flowers from the beginning of *July*, till the frost puts a stop to it.

The second sort grows naturally in *Mexico*, but has been long in the *English* gardens, where it is distinguished from the first by the title of *French Marigold*.

Of this there are several varieties, some of which have much larger flowers than others, and their colour varies greatly; there are some which are beautifully variegated, and others quite plain; but as these are accidents arising from culture, so they do not merit farther distinction; for I have always found that seeds saved from the most beautiful flowers will degenerate, especially if they are sown in the same garden for two or three years together, without changing the seed.

These plants are annual, so must be propagated from seeds every spring, which may be sown upon a moderate hot-bed the beginning of *April*; and when the plants are come up, they should have plenty of fresh air, for if they are drawn too much, they will not afterward become handsome, notwithstanding they have all possible care taken of them. When they are about three inches high, they should be transplanted on a very moderate hot-bed, which may be arched over with hoops and covered with mats, for these plants are hardy enough to be brought up without glasses; in this bed they should be planted about six inches asunder each way, observing to water and shade them until they have taken root; but as the plants acquire strength, they should be inured to bear the open air by degrees; and about the end of *May* they should be taken up with a ball of earth to the root of each plant, and planted into the borders of the parterre-garden, or into pots, for furnishing the courts, &c. shading them carefully from the sun till they have taken new root, and also supplying them duly with water. When their flowers appear, if any should prove single, the plants should be destroyed, and then those in pots may be removed to the court where the several varieties, being intermixed with other annual plants, afford an agreeable variety.

These plants have a strong disagreeable scent, especially when handled, for which reason they are not so greatly esteemed for planting near habitations; but the flowers of the sweet-scented sort being more agreeable, are generally preferred, especially for planting in small gardens.

The third sort grows naturally in *Chili* in the *Spanish West-Indies*. This is a plant of taller growth than either of the former. The stalk is single, erect, and branches a little toward the top; it rises about ten feet high; the branches grow erect. The leaves are narrower than either of the other. The foot-stalks of the flowers are scaly, and stand erect close to the stalk; these sustain three or four small white flowers, which appear very late in autumn; so that unless it is kept in a glass-case, the seeds will not ripen here. This plant has very little beauty, so is only preserved for the sake of variety.

The fourth sort rises with an upright stalk about two feet high, sending out a few branches toward the top, garnished with heart-shaped leaves, standing upon long slender foot-stalks, ending in very acute points, being in shape like those of the black Poplar, rough to the touch, and are slightly crenated on their edges; the branches and stalks are each terminated by one large yellow flower, standing upon a long naked foot-stalk. The empalement of the flower is short; the leaves of which it is composed are oblong and oval, drawing to a point. The female florets, which compose the rays or border, are much longer than the

the empalcment. The hermaphrodite florets, in the disk or middle, are equal; they are of a deep yellow colour, and make a good appearance, for the flowers are double. This plant was discovered by the late Dr. *Houssoun* growing naturally at *La Vera Cruz*, in *New Spain*, from whence he sent the seeds to *England*.

The two last sorts are not so hardy as the former, so the seeds of these should be sown earlier in the spring upon a good hot-bed; and when the plants are fit to remove, they should be transplanted on a fresh hot-bed, at about three inches distance each way, observing to shade them from the sun till they have taken new root; then they should be treated in the same way as the *Amaranthus*, and other tender annual plants, being careful not to draw them up weak; when they have spread so as to meet each other, they should be taken up with balls of earth to their roots, and planted in pots with light rich earth, and plunged into a hot-bed under a deep frame, where the plants may have room to grow, being careful to shade them from the sun till they have taken new root; after which they must have air and water in proportion to the warmth of the season; and when the plants have grown too tall to remain longer in the frame, they should be removed to an airy glass-case, where they may stand to flower and ripen their seeds.

TAMARINDUS. *Tourn. Inst. R. H.* 660. *tab.* 445. The Tamarind-tree.

The Characters are,

The empalcment of the flower is composed of five oval plain leaves, which are equal; the flower has five petals, which are almost like those of the butterfly kind, one of them standing erect, two are placed like wings on each side, and two reflect downward; it has three awl-shaped stamina, situated in the sinuses of the empalcment, and are arched toward the upper petal, terminated by single summits, and an oblong oval germen, supporting an awl-shaped ascending style, crowned by a single stigma. The germen afterward becomes a long, swelling, compressed pod, having a double cover, and one cell containing three, four, or five angular compressed seeds, surrounded with pulp.

We know but one Species of this genus, viz.

TAMARINDUS. *Hort. Cliff.* 18. The Tamarind-tree.

This tree grows naturally in both *Indies*, and also in *Egypt*; but it has been supposed by some eminent botanists, that the Tamarind which grew in the *East-Indies*, was different from that of the *West*, because the pods of the first are almost double the length of those of the latter. The pods which have been brought me from the *East-Indies*, have generally been so long as to contain five, six, and sometimes seven seeds, whereas those of the *West-Indies* have very rarely more than four; but the plants which I have raised from the seeds of both sorts, are so like as not to be distinguished, therefore I suppose it may be owing to the soil or culture, that one is so much larger than the other.

This tree grows to a very large size in those countries where it is a native, but in *England* it will not thrive out of a stove, especially in winter. The stem is very large, covered with a brown bark, and divides into many branches at the top, which spread wide every way, and are closely garnished with winged leaves, composed of sixteen or eighteen pair of lobes, without a single one at the end. The lobes are about half an inch long, and a sixth part of an inch broad, of a bright green, a little hairy, and sit close to the midrib. The flowers come out from the side of the branches five, six, or more together upon the same foot-stalk in loose bunches; these are composed of five reddish petals, one of which is reflexed upward like the standard in some of the butterfly flowers, two others stand on each side like the wings, and the other two are turned downwards; these, (in the countries where the plants grow naturally) are succeeded by thick compressed pods, two, three, four, or five

inches long, having a double skin or cover, and swell in every place where the seeds are lodged, full of an acid stringy pulp, which surrounds smooth, compressed, angular seeds.

The Tamarinds which are brought from the *East-Indies*, are darker and drier, but contain more pulp, being preserved without sugar, and are fitter to be put into medicines than those from the *West-Indies*, which are redder, have less pulp, and are preserved with sugar, so are pleasanter to the palate.

The plants are preserved in the gardens of those who have conveniency to maintain rare exotick trees and shrubs.

They are easily propagated by sowing their seeds on a hot-bed in the spring; and when the plants are come up, they should be planted each into a separate small pot, filled with light rich earth, and plunged into a hot-bed of tanners bark to bring them forward, observing to water and shade them until they have taken root; and as the earth in the pots appear dry, they must be watered from time to time, and should have air given to them in proportion to the warmth of the season, and the bed in which they are placed; when the pots in which they are planted, are filled with their roots, the plants should be shifted into pots of a larger size, which must be filled up with rich light earth, and again plunged into the hot-bed, giving them air, as before, according to the warmth of the season; but in very hot weather the glasses should be shaded with mats in the heat of the day, otherwise the sun will be too violent for them through the glasses, nor will the plants thrive, if they are exposed to the open air, even in the warmest season; so that they must be constantly kept in the bark stove both summer and winter, treating them as hath been directed for the Coffee-tree, with whose culture they will thrive exceeding well.

These plants, if rightly managed, will grow very fast; for I have had them upwards of three feet high in one summer from seed, and have had two plants which produced flowers the same season they were sown; but this was accidental, for none of the older plants have produced any flowers, although I have several plants of different ages, some of which are sixteen or eighteen years old, and about twelve feet high, with large spreading heads.

TAMARIX. *Lin. Gen. Plant.* 337. The Tamarisk.

The Characters are,

The empalcment of the flower is obtuse, erect, and permanent; it is cut into five parts; the flower has five oval concave petals, which spread open, and five hair-like stamina, terminated by roundish summits; it has an acute pointed germen without a style, crowned by three oblong, feathery, twisted stigmas. The germen afterward turns to an oblong acute-pointed capsule with three corners, having one cell, opening with three valves, containing many small downy seeds.

The Species are,

1. TAMARIX *floribus pentandris*. *Hort. Cliff.* 111. Tamarisk with flowers having five stamina; or *French Tamarisk*.

2. TAMARIX *floribus decandris*. *Hort. Cliff.* 111. Tamarisk whose flowers have ten stamina; or *German Tamarisk*.

The first sort grows naturally in the south of *France*, in *Spain*, and *Italy*, where it rises to a middling size, but in *England* is seldom more than fourteen or sixteen feet high. The bark is rough, and of a dark brown colour; it sends out many slender branches, most of which spread out flat and hang downward at their ends; these are covered with a Chestnut-coloured bark, and garnished with very narrow finely divided leaves, which are smooth, of a bright green colour, and have small leaves or indentures which lie over each other like scales of fish. The flowers are produced in taper spikes at the end of the branches, several of them growing on the same branch. The spikes are about an

inch long, and as thick as a large earth-worm. The flowers are set very close all round the spike; they are very small, and have five concave petals, of a pale flesh colour, with five slender stamina, terminated by roundish red summits, and are succeeded by oblong, acute-pointed, three-cornered capsules, filled with small downy seeds, which seldom ripen in *England*.

The wood, bark, and leaves of this tree, are used in medicine, and are accounted specifick for all disorders of the spleen, as being believed to lessen it much. The bark is sometimes used for rickets in children.

The second sort grows naturally in *Germany*, in moist land; this is rather a shrub than tree, having several ligneous stalks arising from the same root, which grow erect, sending out many side branches, which are also erect, having a pale green bark when young, which afterward changes to a yellowish colour. The leaves are shorter, and set closer together than those of the other sort, and are of a lighter green, approaching to a gray colour; the flowers are produced in long loose spikes at the end of the branches, standing erect; they are larger than those of the former, and have ten stamina standing alternately.

These both cast their leaves in autumn, and it is pretty late in the spring before the young ones push out, which renders them less valuable; they are now frequently planted in gardens for ornament, and, when they are mixed with other shrubs, make a pretty variety.

They may be easily propagated by laying down their tender shoots in autumn, or by planting cuttings in an east border in the spring before they begin to shoot, which, if supplied with water in dry weather, will take root in a short time; but they should not be removed until the following autumn, at which time they may be either placed in a nursery to be trained up two or three years, or else into the quarters where they are designed to remain, observing to mulch their roots, and water them according as the season may require, until they have taken root; after which, the only culture they will require is to prune off the straggling shoots, and keep the ground clean about them.

TAMUS. *Lin. Gen. Plant.* 991. The black Briony.

The Characters are,

It has male and female flowers on different plants. Those of the male plants have empalements, composed of six oval, spear-shaped, spreading leaves; they have no petals, but have six short stamina, terminated by erect summits; the flowers of the female have bell-shaped empalements of one leaf, cut into six spear-shaped segments, which sit upon the germen; these have no petals, but have oblong punctured nectarii sitting on the inside of each segment of the empalement, and a large, oblong, oval, smooth germen under the empalement, with a cylindrical style, crowned by three reflexed indented stigmas. The germen afterward becomes an oval berry with three cells, including two globular seeds.

The Species are,

1. TAMUS foliis cordatis indivisis. *Hort. Cliff.* 458. Black Briony with heart-shaped undivided leaves; common black Briony.

2. TAMUS foliis trilobis. *Lin. Sp. Plant.* 1028. Black Briony with leaves which are divided into three lobes.

The first sort is rarely cultivated in gardens, but grows wild under the sides of hedges in divers parts of *England*, and is there gathered for medicinal use. The root is very large, fleshy, and has a dark brown skin or cover; the stalks are smooth, and twine round any neighbouring support, whereby they rise to the height of ten or twelve feet, garnished with smooth heart-shaped leaves, of a lucid green, which are alternate. The flowers are produced in long bunches from the side of the stalks; those of the male plants fall off soon after their farina is cast abroad, but the female flowers are succeeded by oval smooth berries, which are red when ripe.

It may be easily propagated by sowing the seeds soon after they are ripe, under the shelter of bushes, where, in the spring, the plants will come up, and spread their branches over the bushes, and support themselves, requiring no farther care, and their roots will abide many years in the ground without decaying.

The second sort was discovered in the island of *Crete* by *Dr. Tournefort*, who sent the seeds to the Royal Garden at *Paris*; this has a rounder root than the other. The stalks twine round any neighbouring support in like manner; the leaves of this are divided into three lobes, in which the principal difference consists. This is an abiding plant, which is hardy enough to live in the full ground in *England*, and may be propagated as the other.

TANACETUM. *Tourn. Inst. R. H.* 461. *tab.* 261. Tansey.

The Characters are,

It has a flower composed of hermaphrodite and female florets, contained in one common, hemispherical, imbricated empalement, whose scales are compact and acute-pointed. The hermaphrodite florets, which compose the disk of the flower, are funnel-shaped, cut into five segments, which are reflexed; these have five short hair-like stamina, terminated by cylindrical tubulous summits, and a small oblong germen, supporting a slender style, crowned by a bifid revolved stigma. The germen afterward becomes an oblong naked seed. The female florets are trifid, which compose the rays or border, and are deeply divided within; these have an oblong germen, with a slender style, crowned with two reflexed stigmas, but no stamina.

The Species are,

1. TANACETUM foliis bipinnatis incisisserratis. *Hort. Cliff.* 398. Tansey with doubly-winged cut leaves, which are sawed; or common yellow Tansey.

2. TANACETUM foliis pinnatis, laciniis lineari-filiformibus, corymbis glabris, caule herbaceo. *Lin. Sp. Plant.* 844. Tansey with winged leaves, which are cut into linear thread-like segments, a smooth corymbus, and an herbaceous stalk.

3. TANACETUM foliis ovatis integris serratis. *Hort. Cliff.* 398. Tansey with oval, entire, sawed leaves; Coltmary, or Alecoast.

4. TANACETUM foliis pinnatifidis, laciniis lanceolatis obtusiusculis integerrimis. *Lin. Sp. Plant.* 844. Tansey with wing-pointed leaves, having spear-shaped, entire, obtuse segments; or African Tree Tansey.

5. TANACETUM foliis pinnato-multifidis, laciniis linearibus subdivisis. *Hort. Cliff.* 398. Tansey with many-pointed winged leaves, having linear segments, which are divided and acute; or shrubby African Tansey with leaves like the cut-leaved Lavender.

6. TANACETUM foliis pinnatis, pinnis linearibus remotis integerrimis. *Lin. Sp. Plant.* 843. Tansey with winged leaves, whose lobes are linear, grow at a distance from each other, and are entire.

The first sort is the common Tansey, which is used in medicine and the kitchen; this grows naturally by the sides of roads, and the borders of fields in many parts of *England*. It has a fibrous creeping root, which will spread to a great distance, where they are not confined, from which arise many channelled stalks from two to almost four feet high, according to the goodness of the soil, garnished with doubly-winged leaves, whose lobes are cut and sharply sawed, of a deep green colour, and have a pleasant grateful odour. The stalks divide near the top into three or four branches, which stand erect, and are terminated by umbels of naked yellow flowers, composed of many florets, which are included in hemispherical scaly empalements.

There are three varieties of this, one with a curled leaf, which is titled Double Tansey by gardeners; another with variegated

variegated leaves; and a third with larger leaves, which have little scent; but, as these have accidentally been produced from seeds of the common Tansey, they are not enumerated as distinct species.

This sort is easily propagated by the creeping roots, which, if permitted to remain undisturbed, will, in a short time, overspread the ground where they are permitted to grow; so that where-ever this is planted in a garden, the slips should be placed two feet asunder, and in particular beds, where the paths round them may be often dug, to keep their roots within bounds. They may be transplanted either in spring or autumn, and will thrive in almost any soil or situation.

The common Tansey is greatly used in the kitchen early in the spring, at which season, that which is in the open ground, or especially in a cold situation, is hardly forward enough to cut, so that where this is much wanted at that season, it is the best way to make a gentle hot-bed in *December*, and plant the old roots thereon without parting them, and arch the bed over with hoops, to cover it with mats in cold weather, by which method the Tansey will come up in *January*, and be fit to cut in a short time after.

The second sort grows naturally in *Siberia*; this has a perennial fibrous root. The stalks rise three feet high; the leaves are narrow and winged; the lobes are very narrow, and end in two or three points, which are entire; the flowers are produced in small thin umbels from the side, and at the top of the stalk; they are yellow and but small, the umbels having few florets in each. It may be propagated in the same way as the first.

The third sort grows naturally in the south of *France* and *Italy*, but is here planted in gardens, and was formerly pretty much used in the kitchen, and also in medicine. The roots of this are hard, fleshy, and creep in the ground; the lower leaves are oval, sawed on their edges, of a grayish colour, and have long foot-stalks. The stalks rise from two to three feet high, and send out branches from the side, garnished with oval sawed leaves like those at the bottom, but smaller, and sit close to the stalk. The flowers are produced at the top of the stalks in a loose corymbus; they are naked, and of a deep yellow colour. The whole plant has a soft pleasant odour.

It is propagated easily by parting of their roots; the best time for this is autumn, that they may be well established in the ground before the spring. Where this plant is cultivated for use, the plants should be planted in beds at two feet distance every way, that they may have room to grow, for in two years the roots will meet, so every other year they should be transplanted and parted to keep them within compass; they will thrive in almost any soil or situation, but will continue longest in dry land.

The fourth sort grows naturally at the *Cape of Good Hope*; this rises with a shrubby stalk eight or ten feet high, sending out branches on every side, garnished with wing-pointed leaves, whose segments are spear-shaped, entire, and blunt-pointed. The flowers are produced in small roundish bunches at the end of the branches; they are of a Sulphur colour. The seeds rarely ripen in *England*.

The fifth sort was brought from the *Cape of Good Hope*, where it grows naturally; this rises with a branching shrubby stalk three or four feet high, garnished with wing-pointed leaves, whose lobes are very narrow, and frequently cut into acute segments. The flowers are produced in small roundish bunches at the end of the branches; they are larger than those of the former sort, and are of a bright yellow colour.

The sixth sort grows naturally at the *Cape of Good Hope*; this has a thick shrubby stalk, covered with a gray bark, which rises seven or eight feet high, sending out many

branches on every side, which are closely garnished with linear-winged leaves, whose lobes or pinnæ are very narrow, and spread from each other. The leaves sit close to the stalks on every side; the branches are terminated by close, large, roundish bunches, of bright yellow flowers. Some of the foot-stalks sustain but one, others two, three, or four flowers upon each; there is a succession of them on the same plants till late in autumn, and those which come early in the season will be succeeded by seeds.

These three last-mentioned sorts are too tender to live through the winter in the open air, so must be kept in pots, and removed into shelter before hard frosts come on; they are all of them easily propagated by cuttings, which may be planted in a bed of loamy earth, during any of the summer months; these should be shaded from the sun until they have taken root, and must be frequently refreshed with water. When they have good roots, they should be taken up with balls of earth, and planted in pots, placing them in a shady situation till they have taken new root; then they may be removed to a sheltered situation, placing them among other hardy exotick plants, where they may remain till late in *October*, when they must be put into shelter. These plants are so hardy, as only to require protection from hard frost, so must not be tenderly treated, and in mild weather should always be as much exposed to the air as possible, to prevent their drawing weak.

TAN, or TANNERS BARK, is the bark of the Oak-tree, chopped or ground into coarse powder, to be used in tanning or dressing of skins; after which it is of great use in gardening: first, by its fermentation (when laid in a proper quantity), the heat of which is always moderate, and of long duration, which renders it of great service for hot-beds; and secondly, after it is well rotted, it becomes excellent manure for all sorts of cold stiff land, upon which one load of tan is better than two of rotten dung, and will continue longer in the ground.

The use of tan for hot-beds has not been many years known in *England*. The first hot-beds of this sort which were made in *England*, were at *Blackbeath* in *Kent*, above threescore years ago; these were designed for the raising of Orange-trees; but the use of these hot-beds being but little known at that time, they were made but by two or three persons, who had learned the use of them in *Holland* and *Flanders*, where the gardeners seldom make any other hot-beds; but in *England* there were very few hot-beds made of tanners bark, before the Ananas plants were introduced into this country, which was in 1719, since which time the use of these hot-beds have been more general, and are now made in all those gardens where the Ananas plants are cultivated, or where there are collections of tender exotick plants preserved; and the gardeners here are now better skilled in the making and managing of these hot-beds, than in most other countries, which might render it less necessary to give a full description of them here; but yet, as there may be some persons in the remote parts of *England*, who have not had an opportunity of informing themselves of the use of tanners bark for this purpose, I shall insert the shortest and plainest method of making and managing them, as they are practised by the most knowing persons, who have long made use of these hot-beds; and first I shall begin with the choice of the tan.

The tanners, in some parts of *England*, do not grind the bark to reduce it into small pieces, as is commonly practised by the tanners near *London*, where there is great difference in the size of the bark, some being ground much smaller than the other, according to the different purposes for which it is intended; but in many places the bark is only chopped into large pieces, which renders it very different for the use of hot-beds; for if the tan is very coarse, it will require a

longer time to ferment than the small tan, but when it begins to heat, it will acquire a much greater degree, and will retain the heat a much longer time than the small; therefore where there is choice, the middling-sized tan should be preferred, for it is very difficult to manage a hot-bed when made of the largest tan; the heat of which is often so great, as to scald the roots of plants, if the pots are fully plunged into the bed; and I have known this violent heat continue upward of two months, so that it has been unsafe to plunge the pots more than half their depth into the tan, till near three months after the beds have been made; therefore where the persons, who have the care of these beds, do not diligently observe their working, they may in a short time destroy the plants which are placed in the beds: on the other hand, if the tan is very small, it will not retain the heat above a month or six weeks, and will be rotten and unfit for a hot-bed in a short time; so that where the middle-sized tan can be procured, it should always be preferred to any other, otherwise it will be proper to mix the small with the large tan.

The tan should be always such as has been newly taken out of the pits, for if it lies long in the tanners yard before it is used, the beds seldom acquire a proper degree of heat, nor do they continue their heat long; so that when it has been more than three weeks or a month out of the pit, it is not so good for use as that which is new. If the tan is very wet, it will be proper to spread it abroad for two or three days, to drain out the moisture, especially if it is in autumn or winter season, because then, as there will be little sun to draw a warmth into the tan, the moisture will prevent the fermentation, and the beds will remain cold, but in the summer season there is no great danger from the moisture of the tan. The heat of the sun through the glasses will be then so great, as soon to cause a fermentation in the tan.

These tan-beds should always be made in pits, having brick-walls round them, and a brick pavement at the bottom, to prevent the earth from mixing with the tan, which will prevent the tan from heating. These pits must not be less than three feet deep, and six feet in width; the length must be in proportion to the number of plants they are to contain, but if they are not ten feet in length, they will not retain their heat long, for where there is not a good body of tan, the outside of the bed will soon lose its heat; so that the plants, which are there plunged, will have no benefit of the warmth, nor will the middle of these beds retain their heat long, so that they will not answer the purpose for which they are intended.

When the tan is put into the bed, it must not be beaten or trodden down too close, for that will cause it to adhere, and form one solid lump, so that it will not acquire a proper heat; nor should it be trodden down at the time when the pots are plunged into the beds; to avoid which, there should be a board laid cross the bed, which should be supported at each end, to prevent its resting upon the tan, upon which the person should stand who plunges the pots, so that the tan will not be pressed down too close. When the tan is quite fresh, and has not been out of the pits long enough to acquire a heat, the beds will require a fortnight or three weeks time, or sometimes a month, before they will be of a proper temperature of warmth to receive the plants; but in order to judge of this, there should be three or four sticks thrust down in the tan about eighteen inches deep, in different parts of the bed, so that by drawing out the sticks, and feeling them at different depths, it will be easy to judge of the temper of the bed; and it will be proper to let a few of these sticks remain in the bed, after the plants are plunged, in order to know the warmth of the tan, which may be better judged of by feeling these sticks, than by drawing out the pots, or plunging the hand into the tan.

When the tan is good, one of these beds will retain a proper degree of heat for near three months; and when the heat declines, if the tan is forked up, and turned over, and some new tan added to it, the heat will renew again, and will continue two months longer; so that by turning over the tan, and adding some new tan every two months, or thereabouts, as the bed is found to decline of its heat, they may be continued one year; but every autumn it will be proper to take out a good quantity of the old tan, and to add as much new to the bed, that the heat of the bed may be kept up in winter, for if the heat is suffered to decline too much during the cold season, the plants will suffer greatly; to prevent this, there should always be some new tan added to the bed in winter, when the heat is found to decline; but the tan should be laid in a dry place a week or ten days to dry, before it is put into the bed, otherwise the moisture will chill the old tan in the bed, and prevent the fermentation; so that unless the tan is turned over again, there will be little or no heat in the beds, which often proves fatal to the plants which are plunged in them; therefore whoever has the management of these beds, should be very careful to observe constantly the warmth of the tan, since, upon keeping the beds in a due temperature of warmth, their whole success depends; and where this caution is not taken, it frequently happens that the Ananas plants run into fruit very small, or the plants are infested by insects; both which are occasioned by the growth of the plants being stopped, either by the decline of the heat of the tan, or the heat being too great; therefore great regard must be had to that, especially in winter.

The great advantages which these tan-beds have of those which are made of horse-dung, are the moderate degree of heat which they acquire, for their heat is never so violent as that of horse-dung, and they continue this heat much longer; and when the heat declines, it may be renewed, by turning the beds over, and mixing some new tan with the old, which cannot be so well done with horse-dung, and likewise the beds will not produce so great steams, which are often injurious to tender plants, so that these tan-beds are much preferable to those of horse-dung for most purposes.

Tan, when it is well rotted, is also an excellent manure for all cold and stiff lands; and if it is laid upon Grass ground in autumn, that the rains in winter may wash it into the ground, it will greatly improve the Grass; but when it is used new, or in the spring of the year, when dry weather comes, it is apt to cause the Grass to burn, which has occasioned the disuse of tan in many places, but if properly used, it will be found an excellent dressing for all stiff lands.

TAPIA. See Crateva.

TARCHONANTHUS. *Lin. Gen. Plant.* 846.

The Characters are;

It has a flower composed of several hermaphrodite florets, included in one common top-shaped empalement, which is short, permanent, and hairy. The florets are uniform, funnel shaped, and of one petal, indented in five parts at the top; they have each five very short hair-like stamina, terminated by cylindrical tubulous summits longer than the petal, and an oblong germen, supporting a style the length of the stamina, crowned by two awl-shaped stigmas, which open lengthways. The germen afterward turns to a single oblong seed, crowned with down, which ripens in the empalement.

We know but one Species of this genus, viz.

TARCHONANTHUS. *Hort. Cliff.* 398. Shrubby African Fleabane with Sage leaves smelling like Camphire.

This plant grows naturally at the Cape of Good Hope; it has a strong woody stalk, which rises to the height of twelve or fourteen feet, sending out many ligneous branches at the top, garnished with leaves, which are in shape like those

those of the broad-leaved Sallow, having a downy surface like those of Sage, and their under sides are white; these resemble in smell the Rosemary leaves when bruised. The flowers are produced in spikes at the extremity of the shoots, which are of a dull purple colour, so do not make any great appearance. The usual time of its flowering is in autumn; they continue great part of winter, but are not succeeded by seeds here. These plants are preserved to make a variety in the green-house, during the winter season, by those who are curious in collecting of foreign plants; they retain their leaves all the year.

It is too tender to live through the winter in the open air in *England*, but requires no artificial heat, therefore may be placed in a common green-house with Myrtles, Oleanders, and other hardy exotick plants in winter, and in summer may be exposed with them in the open air, and treated in the same manner as they are.

It may be propagated by cuttings, which should be planted in *May*, in pots filled with light earth, and if they are plunged into a moderate hot bed, it will promote their putting out roots. These should be shaded with mats, or covered with oiled paper, to screen them from the sun until they are rooted. By the middle of *July* these cuttings will have taken root, when they should be each transplanted into a separate pot, and placed in the shade until they have taken new root; after which time they may be placed with other hardy exotick plants in a sheltered situation, where they may remain till the middle or end of *October*, when they should be removed into the green-house, placing them where they may have a large share of air in mild weather. This plant is very thirsty, so must be often watered, and every year the plants must be shifted, and, as they increase in size, should be put into larger pots.

TARRAGON. See *Abrotanum*.

TAXUS. *Tourn. Inst. R. H. 589. tab. 362.* The Yew-tree.

The Characters are,

The male flowers are for the most part produced on separate trees from those with fruit; they have neither empalement or petals, but the germ is like a four-leaved cover; they have a great number of stamina, which are joined at the bottom in a column longer than the germ, terminated by depressed summits, having eight points, opening on each side their base, casting their farina. The female flowers are like the male, having no empalement or petals, but have an oval acute-pointed germen, but no style, crowned by an obtuse stigma. The germen afterward becomes a berry lengthened from the receptacle, globular at the top, covered by a proper coat at bottom, open at the top, full of juice, and of a red colour, but, as it dries, wastes away, including one oblong-oval seed, whose top without the berry is prominent.

We have but one Species of this plant in *England*, viz.

TAXUS foliis approximatis. *Lin. Sp. Plant. 1040.* Yew-tree with leaves growing near each other; or the common Yew.

This tree grows naturally in *England*, and also in most of the northern countries of *Europe*, and in *North America*, where if it is suffered to stand long, will rise to a good height, and have very large stems; it naturally sends out branches on every side, which spread out, and are almost horizontal; these are closely garnished with narrow, stiff, blunt-pointed leaves, of a very dark green. The flowers come out from the side of the branches in clusters; the male flowers having many stamina, are more conspicuous than the female; these for the most part are upon different trees, but sometimes are upon the same tree; they appear the latter end of *May*, and the berries ripen in autumn.

There is hardly any sort of ever-green tree, which has been so generally cultivated in the *English* gardens as the Yew, upon the account of its being so tonfise, as to be with

ease reduced into any shape the owner pleased; and it may be too often seen, especially in old gardens, what a wretched taste of gardening prevailed formerly in *England*, from the monstrous figures of beasts, &c. we find these trees reduced into; but of late this taste has been justly exploded by persons of superior judgment, for what could be more absurd than the former methods of planting gardens? where, those parts next the habitation, were crowded by a large quantity of these and other sorts of ever-green trees, all of which were clipped into some trite figure or other, which, besides the obstructing the prospect from the house, and filling up the ground, so that little room was left for other shrubs and flowers. Beside, it occasioned an annual expence to render the trees disagreeable, for there never was a person, who had considered the beauty of a tree in its natural growth, with all its branches diffused on every side, but must acknowledge such a tree infinitely more beautiful than any of those shorn figures, so much studied by persons of a grovelling imagination.

The only use this tree is fit for in gardens, is to form hedges for the defence of exotick plants; for which purpose, when it is necessary to have hedges, it is the most proper of any tree in being; the leaves being small, the branches are produced very closely together; and if carefully shorn, they may be rendered so close, as to break the winds better than any other sort of fence whatever, because they will not be reverberated, as against walls, pales, and other close fences; therefore consequently, are much to be preferred for such purposes.

These trees may be easily propagated by sowing their berries in autumn as soon as they are ripe (without clearing them from the pulp which surrounds them, as hath been frequently directed), upon a shady bed of fresh undunged soil, covering them over about half an inch thick with the same earth.

In the spring the bed must be carefully cleared from weeds; and if the season prove dry, it will be proper to refresh the bed with water now and then, which will promote the growth of the seeds; many of which will come up the same spring, but others will remain in the ground until autumn or spring following; but where the seeds are preserved above ground till spring before they are sown, the plants never come up till the year after, so that by sowing the seeds as soon as they are ripe, there is often a whole year saved.

These plants, when they come up, should be constantly cleared from weeds, which, if permitted to grow amongst them, would cause their bottoms to be naked, and frequently destroy the plants when they continue long undisturbed.

In this bed the plants may remain two years; after which, in autumn, there should be a spot of fresh undunged soil prepared, into which they should be removed the beginning of *October*, planting them in beds about four or five feet wide, in rows about a foot asunder, and six inches distance from each other in the rows, observing to lay a little mulch upon the surface of the ground about their roots, as also to water them in dry weather until they have taken root; after which they will require no farther care, but to keep them clear from weeds in summer, and to train them according to the purpose for which they are designed.

In these beds they may remain two or three years, according as they have grown, when they should again be removed into a nursery, placing them in rows at three feet distance, and the plants eighteen inches asunder in the rows, observing to do it in autumn, as was before directed, and continue to trim them in the summer, for what they are intended; after they have continued three or four years in this nursery, they may be transplanted where they are to remain, always observing to remove them in autumn where

the ground is very dry; but on cold moist land it is better in the spring.

These trees are very slow in growing, but yet there are many very large trees upon some barren cold soils, in divers parts of *England*. The timber of these trees is greatly esteemed for many uses.

TELEPHIOIDES. See *Andrachne*.

TELEPHIUM. *Tourn. Inst. R. H. 248. tab. 128.* Orpine.

The Characters are,

The empalement of the flower is permanent, composed of five leaves, which are obtuse, and the length of the petals. The flower has five oblong obtuse petals, and five awl-shaped stamina, which are shorter than the petals, terminated by prostrate summits, with a three-cornered acute germen, having no style, crowned by three acute spreading stigmas. The germen afterward turns to a short three-cornered capsule with one cell, opening with three valves, containing many round seeds.

We have but one Species of this genus in the English gardens, viz.

TELEPHIUM. *Hort. Upsal. 70.* Orpine, Live long, or the true Orpine of *Imperatus*.

This plant grows naturally in the south of *France* and *Italy*. The root is composed of ligneous fibres of a yellowish colour. The branches or stalks are slender, and trail upon the ground; they are garnished with small, oval, smooth leaves, of a grayish colour, which are ranged alternately along the stalk, having one longitudinal nerve running through the middle. The flowers are produced at the end of the branches in short thick spikes, which are reflexed like those of the *Heliotropium*. They are composed of five white petals, which spread open, and are the length of the empalement, having five very slender stamina, terminated by yellow summits.

This is propagated by seeds, which should be sown in autumn, on a bed of fresh light earth, in an open situation, for if they are sown in the spring, the plants will not come up till the following spring. When the plants are come up, they should be thinned, so as to leave them six or eight inches asunder, and should be constantly kept clear from weeds; for if these are permitted to grow, they will soon overbear the plants, and destroy them. These plants do not bear removing well, so should stand in the place where they were sown. In the summer they will flower, and the seeds will ripen in autumn, which will scatter soon if it is not gathered when ripe; and, if the ground is not disturbed, the plants will come up in plenty, and require no other care than to keep them clear from weeds.

TEREBINTHUS. See *Pistachia*.

TERNATEA. See *Clitoria*.

TERRACES. A terrace is a bank of earth, raised on a proper elevation, so that any person who walks round a garden, may have a better prospect of all that lies round him; and these elevations are so necessary, that those gardens which are flat, and that have them not, are deficient.

When the terraces are rightly situated, they are great ornaments, especially when they are well made, and their ascent not too steep.

There are several kinds of terrace walks:

1. The great terrace, which generally lies next to the house.

2. The side terrace, which is commonly raised above the level of the parterre, lawn, &c.

3. Those terraces which encompass a garden.

As to the breadth of side terraces, this is usually decided by its correspondence with some pavilion, or some little jetty or building; but most of all by the quantity of stuff that is to spare for those purposes.

The side terrace of a garden ought not to be less than twenty feet, and seldom wider than forty.

As for the height of a terrace, some allow it to be but five feet high, but others more or less, according to their fancies; but more exact persons never allow above five or six feet, but in a small garden, and a narrow terrace walk, three feet; and sometimes three feet and a half high are sufficient for a terrace twelve feet wide, and four feet are sufficient for a terrace of twenty feet wide; but when the garden is proportionably large, and the terrace is thirty or forty feet wide, then it must be at least five or six feet high.

The noblest terrace is very deficient without shade, for which Elm-trees are very proper; for no seat can be said to be complete, where there is not an immediate shade almost as soon as out of the house, and therefore these shady trees should be detached from the body and wings of the edifice.

TETRACERA. *Lin. Gen. Plant. 604.*

The Characters are,

The flower has a permanent empalement of six roundish spreading leaves; the three outer are alternate, and smaller than the other; it has six small petals, which soon fall off, and a great number of stamina, which are permanent, the length of the empalement, terminated by single summits; it has four oval germen, supporting a short awl-shaped style, crowned by an obtuse stigma. The germen afterward becomes four oval reflexed capsules, each having one cell, opening at the suture on the upper side, inclosing one roundish seed.

We have but one Species of this genus, viz.

TETRACERA. *Hort. Cliff. 214.*

This plant grows naturally at *La Vera Cruz*, where it was discovered by the late Dr. *Houssoun*, who sent it to *England*. It has a woody stalk, which rises to the height of twelve or fourteen feet, covered with a gray bark, sending out several slender ligneous branches, which twine about any neighbouring support, garnished with oblong oval leaves, whose surface are very rough, slightly indented on their edges toward their points, having many transverse veins running from the midrib to the edges, placed alternate on the branches, standing upon short foot-stalks, of a grayish colour on their upper surface, and brown on their under. The flowers are produced in panicles at the end of the branches; these panicles are composed of three or four short thick spikes, which branch out from the lower part of the principal spike, which is much longer and thicker than the other. The flowers have six thin purple petals, of the same length as the empalement, which are very fugacious, so that they soon fall off; these sit upon the germen. After the flowers are past, the four germen become so many oval capsules, which are reflexed backward; these open lengthways on the upper side, and have each one oblong seed inclosed.

This shrub is very different from that which Dr. *Plukenet* titles *Fagus Americanus ulmi amplissimis foliis, capsulis bigemellis*. *Amalth. 87.* though Dr. *Linnaeus* has added this synonyme to it.

This is propagated by seeds, which must be procured from the countries where the plant naturally grows, which may probably be found in some of the *British* islands in the *West-Indies*. I have received it from the island of *Barbuda*, where it was found by the late Dr. *Cressy*, who sent me specimens and seeds. These seeds are frequently abortive, for, upon examining them, there was scarce more than a twentieth part which had any kernels; the others appeared fair, but were hollow. The seeds should be sown in pots filled with light earth, and plunged into a moderate hot-bed of tanners bark, where they must be treated in the same way as other exotick seeds from the same countries; and as the plants seldom come up the same year, the pots should be removed into the stove before winter, and plunged into the tan-bed, between the other pots of plants, where they

they should remain till spring, when they should be taken out and plunged into a fresh hot-bed of tanners bark, which will bring up the plants if the seeds were good. When the plants are fit to remove, they should be each planted in a separate small pot, filled with light earth, and plunged into a good bed of tan, shading them from the sun till they have taken new root; after which their treatment must be the same as for the *Annona*, and the like tender exotick plants, which require to be kept always in the tan-bed.

TETRAGONIA. *Lin. Gen. Plant.* 551.

The Characters are,

The flower has a permanent coloured empalement, composed of four oval plain leaves, sitting upon the germen. It has no petals, but about twenty hair-like stamina, which are shorter than the empalement, terminated by oblong prostrate summits, and a roundish four-cornered germen under the flower, supporting four oval shaped styles, which are recurved and as long as the stamina, with hairy stigmas the length of the styles. The germen afterward becomes a thick capsule with four cells, having four angles, which have narrow wings or borders, containing one hard oblong seed in each.

The Species are,

1. **TETRAGONIA foliis linearibus.** *Flor. Leyd. Prod.* 250. *Tetragonia* with linear leaves.
2. **TETRAGONIA foliis ovatis integerrimis, caule fruticoso decumbente,** *Tetragonia* with oval entire leaves, and a shrubby trailing stalk.
3. **TETRAGONIA foliis ovatis.** *Flor. Leyd. Prod.* 250. *Tetragonia* with oval leaves.

These plants grow naturally at the *Cape of Good Hope*. The first sort has slender ligneous stalks, which rise three or four feet high, if they are supported, otherwise they trail upon the ground, covered with a light gray bark, and divide into a great number of trailing branches, which, when young, are succulent, of an herbaceous colour, covered with small pellucid drops, somewhat like the *Diamond Ficoides*, which reflect the light. As the branches are older, they become more ligneous; they are garnished with thick, succulent, narrow, concave, blunt leaves, placed alternate, and at their base come out a cluster of smaller leaves. The flowers are produced from the wings of the stalks at every joint toward the end of the branches, sometimes they come singly, at others there are two, and sometimes three flowers at each joint; these have empalements of five leaves, which spread open, and are a little reflexed; they are green without, and yellow within, each having about forty stamina, which are terminated by oblong prostrate summits, which fill up the middle of the flower. They appear in *July* and *August*, and are succeeded by large four-cornered capsules, having four wings or borders, and four cells, each containing one oblong seed, which ripens in winter.

The second sort has larger stalks than the former, which branch out in like manner; the branches trail upon the ground where they are not supported; the young branches are very succulent, and almost as thick as a man's little finger; the leaves are two inches long, and one broad; their surface are covered with very small pellucid drops, as are the stalks. The flowers are larger, and stand upon pretty long foot-stalks, three or four arising from the same points; the empalement, and also the summits, are of a pale Sulphur colour.

These may be propagated by cuttings, which should be cut from the plants a few days before they are planted, that the part where they are cut may be healed, otherwise they will rot; for the leaves and stalks of this plant are very full of moisture. The best time to plant these cuttings is in *July*, that they may have time to make good roots before winter. They may be planted on a bed of fresh earth; and if they are shaded from the sun in the heat of the day,

it will be of service to them. They should be frequently refreshed with water; but they must not have it in too great plenty, for that will rot them. In about six weeks after planting, the cuttings will be sufficiently rooted to transplant, therefore they should be taken up, and planted in pots filled with light, fresh, undunged earth, and placed in a shady situation, until they have taken new root; after which time they may be placed with other hardy exotick plants, in a sheltered situation, where they may remain till the middle or latter end of *October*; at which time they should be removed into the green-house, and placed where they may enjoy as much free air as possible in mild weather, for they only require to be protected from the frost, being pretty hardy with respect to cold; but they should not have too much moisture in winter. If these plants are planted in the full ground in the summer season, they will grow prodigiously rank and large, as they also will if they are permitted to root into the ground through the holes at the bottom of the pots; therefore the pots should be frequently removed to prevent it, for when they grow too freely, their leaves will be very full of moisture; which, together with the weight of the fruit, which are always produced at the extremity of the branches, will weigh the branches upon the ground, and render the plants very un-fightly. The plants of this kind commonly grow very straggling; therefore the more their roots are confined in the pots, the more close and stunted will be the heads of the plants, which is what they should always be kept to, in order to render them fightly. The flowers of this plant have no great beauty, but as the whole face of the plant is peculiar, it may be allowed a place in every collection of plants for the sake of variety, since it requires no great trouble to cultivate it.

These plants may also be propagated by seeds, which should be sown on a warm border of light fresh earth, where sometimes they will remain a whole year before the plants come up; therefore when they do not come up the first season, the borders should not be disturbed, but kept constantly clear from weeds; and when the plants are come up about four inches high, they should be taken up and planted in pots (and treated in the same manner as hath been directed for the cuttings); for if they are suffered to grow in the border till they are large, they will not transplant so well, nor will they make so handsome plants.

The third sort hath large fleshy roots; the branches are weak, and trail upon the ground; these generally decay about *Midsummer*, and new shoots are produced late in autumn. The leaves of this come out in bunches; they are oval, plain, and not so thick and succulent as those of the other sorts. The flowers are produced from the wings of the leaves in *February*; these are like those of the second sort, and have pretty long slender foot-stalks. The cuttings of this sort will grow, if they are planted early in the spring; so that it may be propagated with the same facility as either of the other kinds.

All these sorts require protection in winter; but if they are placed in an airy glass-case, or under a frame in winter, with *Ficoides*, and other hardy plants, where they may have a large share of free air in mild weather, and protected from the frost, they will thrive much better than when they are more tenderly treated.

TETRAGONOTHECA. *Hort. Elth.* 283. Sun-flower.

The Characters are,

The flower is composed of hermaphrodite and female florets, which are included in one large common empalement, cut into four plain, triangular, heart shaped segments, which spread open. The disk or middle of the flower is made up of hermaphrodite florets, which are funnel-shaped, cut into five parts at the brim, which are reflexed; they have five short hair-like stamina, terminated

minated by cylindrical summits, and a naked germen, supporting a slender style, crowned by two reflexed stigmas. The germen after-ward becomes one naked roundish seed. The female half florets, which compose the ray or border of the flower, have their petals stretched out like a tongue on one side, and are cut at their points into three equal acute parts. These have no stamina, but a naked germen, supporting a slender style with two twisted stigmas, and are succeeded by single naked seeds.

We have but one Species of this genus, viz.

TETRAGONOTHECA. *Lin. Sp. Plant.* 903. Dwarf Sun-flower.

This plant is a native of *Carolina*; the roots of this plant are perennial, but the stalks are annual, and perish in autumn on the approach of cold. The roots will abide through the winter in the full ground, if they are planted in a warm situation, so do not require any shelter, except in very severe winters; when, if they are covered over with rotten tan, or Peas haulm, to keep out the frost, there will be no danger of their being killed.

About the latter end of *April*, or the beginning of *May*, the roots will send forth new shoots, which are garnished with large, oblong, rough leaves, placed by pairs, closely embracing the stalks; these are a little sinuated on their edges, and are covered with small hairs. The stalks usually grow about two feet high in *England*, and branch out toward the top into several smaller stalks, each having one large yellow flower at their top, shaped like a Sun-flower, which, before it expands, is covered with the inflated empalement, which is four-cornered. The seeds of this plant rarely ripen in *England*, but when they are obtained from abroad, they should be sown in the full ground in the spring of the year, where sometimes they will remain a year before the plants come up; so that if they do not come up the same year, the ground should not be disturbed, but kept clean from weeds, and wait till the second year to see what plants will come up. When the plants appear, they must be kept clean from weeds, and if the season should prove dry, they will require to be frequently watered. In autumn the plants should be transplanted into the places where they are to remain.

These plants will live three years in a proper soil and situation; but as it does not ripen seeds here, the best method is to procure good seeds from abroad annually.

TEUCRIUM. *Lin. Gen. Plant.* 625. Tree Germander.

The Characters are,

The empalement of the flower is of one leaf, cut into five acute equal segments at the top, and is permanent. The flower is of the lip kind with one petal, having a short cylindrical tube a little incurved at the chaps. The upper lip is erect, and deeply cut into two acute segments. The lower lip spreads, and is cut into three; the middle one is large and roundish; the two side ones are acute and erect. It has four awl-shaped stamina, which are longer than the upper lip, and are prominent between the segments, terminated by small summits. It has a germen divided in four parts, supporting a slender style, crowned by two slender stigmas. The germen after-ward turns to four roundish naked seeds, which ripen in the empalement.

The Species are,

1. **TEUCRIUM** foliis cordatis undulatis obtusè serratis, floralibus integerrimis concavis, caule fruticoso. *Lin. Sp. Plant.* 565. Tree Germander with heart-shaped waved leaves, which are bluntly sawed, those between the flowers concave and entire, and a shrubby stalk; common Tree Germander.

2. **TEUCRIUM** foliis ovatis crenatis, floralibus lanceolatis integerrimis, caule fruticoso. Tree Germander with oval crenated leaves, those between the flowers spear-shaped and entire, and a shrubby stalk; shrubby *Alpine* Tree Germander with shining leaves.

3. **TEUCRIUM** foliis integerrimis oblongo-ovatis petiolatis,

suprà glabris, subtus tomentosis. *Lin. Sp. Plant.* 563. Tree Germander with entire, oblong, oval leaves, having foot-stalks, smooth above, and hoary underneath; or *Spanish* Tree Germander.

4. **TEUCRIUM** foliis integerrimis, rhombeis, acutis, villosis, subtus tomentosis. *Hort. Upsal.* 195. Tree Germander with entire leaves, which are hairy, shaped like an acute rhombus, and woolly on their under side.

5. **TEUCRIUM** foliis multifidis, floribus solitariis. *Lin. Sp. Plant.* 562. Germander with many-pointed leaves, and flowers growing singly.

6. **TEUCRIUM** foliis multifidis, floribus verticillatis utrinque ternis. *Lin. Sp. Plant.* 562. Germander with many-pointed leaves, and flowers growing in whorls by threes.

7. **TEUCRIUM** foliis ovatis inciso-crenatis petiolatis, floribus subverticillatis. *Hort. Cliff.* 302. Germander with oval leaves on foot-stalks, with crenated cuts, and flowers growing almost in whorls; or smaller creeping Germander.

8. **TEUCRIUM** foliis ovatis utrinque acutis, supernè serratodentatis, floribus racemosis. *Flor. Leyd. Prod.* 307. Germander with oval leaves, which are pointed at both ends, saw-indented toward their points, and flowers growing in bunches.

9. **TEUCRIUM** foliis oblongo-ovatis inciso-crenatis acuminatis, floribus subverticillatis. Germander with oblong oval leaves, which are acute-pointed, jagged, and crenated, and have flowers growing almost in whorls; or greater creeping Germander.

10. **TEUCRIUM** foliis ovatis tomentosis, obtusè crenatis, floralibus integerrimis, calycibus aculeatis. Teucrium with oval woolly leaves, which are obtusely crenated, those among the flowers entire, and the empalements of the flowers ending in acute points.

11. **TEUCRIUM** foliis oblongo-ovatis supernè serratis villosis, subtus incanis sessilibus, floribus subverticillatis. Teucrium with oblong oval leaves, which are sawed toward their points, hairy, and hoary on their under side, sitting close to the branches, and flowers growing almost in whorls; or hoary *Alpine* Germander.

12. **TEUCRIUM** foliis cordatis serratis petiolatis, racemis lateralibus secundis, caule erecto. *Lin. Sp. Plant.* 564. Germander with heart-shaped sawed leaves, having foot-stalks, many long bunches of flowers growing from the wings, and an upright stalk; or wild Sage.

13. **TEUCRIUM** foliis oblongis sessilibus dentato serratis, floribus geminis axillaribus, caule diffuso. *Lin. Sp. Plant.* 565. Germander with oblong saw-indented leaves sitting close to the branches, and flowers growing by pairs at the wings of the stalk, which is diffused; or Water Germander.

14. **TEUCRIUM** foliis integerrimis ovatis utrinque acutis, racemis secundis villosis. *Lin. Sp. Plant.* 564. Germander with oval entire leaves, which are pointed at both ends, and hairy bunches of flowers; *Syrian* Mastick, or common Marum.

15. **TEUCRIUM** foliis trifidis linearibus integerrimis, floralibus sessilibus axillaribus. *Hort. Upsal.* 160. Germander with linear, trifid, entire leaves, and flowers sitting close, growing out of the wings of the branches; or common Ground Pine.

16. **TEUCRIUM** foliis linearibus villosissimis supernè dentatis, floralibus sessilibus. Germander with the most hairy linear leaves, which are indented toward their points, and flowers sitting close to the wings of the stalk; or Musk Ground Pine.

17. **TEUCRIUM** foliis linearibus tomentosis integerrimis, floralibus sessilibus. Germander with linear, woolly, entire leaves, and flowers sitting close to the branches; or Musk Ground Pine with entire leaves.

18. **TEUCRIUM** foliis oblongo-ovatis obtusè dentatis, floralibus solitariis alaribus pedunculatis, calycibus acutis. Germander with

with oblong oval leaves which are bluntly indented, and flowers placed singly at the wings of the stalks, having acute empalements.

19. *TEUCRIUM foliis ovato-lanceolatis, inæqualiter serratis, racemis alaribus terminalibusque calycibus inflatis.* Germander with oval spear-shaped leaves which are unequally sawed, and long bunches of flowers springing from the wings, and terminating the stalks, and inflated empalements.

The first sort grows naturally in the south of *France*, in *Spain*, and in *Italy*; it rises with a shrubby stalk two or three feet high, sending out many ligneous branches, garnished with heart-shaped leaves, a little waved, bluntly sawed on their edges, of a lucid green on their upper side, but a little hoary on their under, standing upon short foot-stalks. The upper part of the branches, for six or eight inches in length, are adorned with flowers, which come out from the wings of the stalk, two or three standing on each side at every joint; they are of a dirty white colour, and stand upon slender foot-stalks; under each of these whorls stand two smaller leaves, which are entire and concave.

This sort was formerly preserved in green-houses with great care, but of late years it hath been planted in the full ground, and is found hardy enough to endure the cold of our severest winters without shelter, provided it is planted on a dry soil.

This may be propagated by planting cuttings in the spring, on a bed of fresh light earth, observing to shade and water them until they have taken root; after which they will require no farther care, but to keep them clear from weeds, until the following autumn, when they may be transplanted where they are to remain, being very careful in removing them not to shake off all the earth from their roots, as also to water them, if the season should prove dry, until they have taken fresh root; after which, the only care they require is to keep the ground clean about them, and to prune off such shoots as are ill situated, and the flowering branches when they decay, whereby their heads will appear more regular.

It may also be propagated by seeds, which generally are produced in plenty. If these are sown upon a bed of light earth in *April*, the plants will come up in six weeks after, and may be transplanted in autumn, where they are designed to remain.

The second sort grows naturally on the *Alps*, but in the lower parts, where the cold is not very severe, and generally on moist ground; this hath a shrubby stalk like the former, and rises about the same height, but branches out more than that. The stalks are covered with a short hairy down; the lower leaves are oval, crenated, and of a lucid green on their upper side, but a little hoary on their under; the leaves between the flowers are spear-shaped and entire; the spikes of flowers are much longer; the flowers are larger, and their colour more inclining to a yellow than those of the former, and may be propagated in the same way.

The third sort grows naturally in *Spain* and *Sicily*, near the borders of the sea; this has a shrubby branching stalk, which rises six or eight feet high, covered with a hoary bark. The branches are garnished with small oval leaves, placed opposite, sitting close to them; they are smooth on their upper side, of a lucid green, but their under sides are hoary. The flowers come out singly from the wings of the stalk at the upper part of the branches, one on each side standing upon short foot-stalks; their empalements are short and hoary. The middle segment of the lower lip is large, and indented at the point; the stamina are long-hooked, and supply the place of the upper lip; the flowers are blue, and come in succession great part of summer, but the plants seldom produce good seeds in *England*.

There is a variety of this with variegated leaves, which is preserved in some gardens.

The third sort is tenderer than the former, though this will endure the cold of our ordinary winters, if planted on a dry soil and in a warm situation, but in severe frost it is sometimes destroyed; for which reason the plants are often preserved in pots, and removed into the greenhouse in winter. This is propagated by cuttings in the same manner as the former.

The fourth sort grows naturally in *Spain*; this has a great resemblance of the third, but the branches spread more horizontally. The leaves are sometimes heart-shaped, and at others in form of a rhombus; the lower leaves, which are the largest, are an inch and a half long, and three quarters of an inch broad; the upper are smaller, and of a different shape; these are downy on both sides, but the lower leaves are only so on the under. The flowers come out at the upper parts of the branches in like manner as the former, but are larger, and of a paler blue colour.

This is propagated in the same way as the other, and the plants require the same treatment.

The fifth sort grows naturally in *Spain* and *Italy* upon moist ground. The stalks of this are herbaceous, and trail upon the ground; they grow about a foot in length, and are garnished with deep green leaves cut in many points almost to the midrib; they are smooth, and stand opposite. The flowers are white, and come out on each side the stalks singly; these are succeeded by four seeds, which ripen in autumn.

This plant is preserved in botanick gardens for variety; it is propagated by seeds, which may be sown in the spring in the place where the plants are to remain, and, when they come up, will require no other culture but to thin them where they are too close, and keep them clean from weeds. These plants ripen their seeds the first year, but, if they are in a warm situation, they will live through the winter.

The sixth sort grows naturally in the south of *France*, in *Italy* and *Germany* in the Corn fields; this is an annual plant, which perishes soon after seeds are ripe. The stalks are four-cornered and hairy, about a foot long, garnished at every joint by leaves placed opposite, which are hairy and almost cut to the midrib; the segments are cut into three points. The flowers come out at the wings of the stalks in whorls, three standing together on each side upon short foot-stalks; they are white, and shaped like those of the other species; the seeds ripen in *August* and *September*.

This is propagated by seeds in the same way as the last; but if the seeds of this are sown in autumn, or permitted to scatter when ripe, they will succeed better than if sown in the spring, and the plants will come earlier to flower.

The seventh sort grows naturally in the south of *France*, and in *Germany*; this has a creeping fibrous root, which spreads in the ground, and multiplies greatly, sending out many four-cornered hairy stalks, which are eight or nine inches long, having a few short branches, garnished with oval leaves, which are deeply crenated on their borders, upon foot-stalks; they are of a light green above, but hoary on their under side. The flowers grow from the wings of the stalks, towards the upper part almost in whorls, standing chiefly to one side of the stalk; they are of a reddish colour, the lower lip turning inward. The seeds ripen in autumn.

It is a perennial plan, and propagates very fast by its creeping roots, and will thrive in almost any soil or situation: the best time to transplant it is in autumn. This was a few years since in great request as a specificck for the gout, but is at present in little esteem.

The eighth sort grows naturally in *Spain*; this is a perennial plant, having some resemblance of the former, but the roots do not creep. The stalks are taller and more erect; the leaves are narrower, pointed at both ends, and not so

deeply indented; the indentures are sharper; the stalks are garnished with flowers great part of their length, which come out in bunches at the wings; they are longer than those of the former, and of a brighter red colour.

It may be propagated by parting of the roots in autumn, or by sowing of the seeds at the same season, which will more certainly succeed than those which are sown in the spring. It loves an open situation exposed to the sun, but will thrive in almost any soil which is not too moist.

The ninth sort grows naturally in *Italy*; this is like the seventh sort, but the stalks grow almost twice the length of those, and send out a greater number of branches. The leaves of this are more acutely indented on their edges; they are hairy, of a light green on their upper side, and hoary on their under. The flowers grow almost in whorls from the wings of the stalks, to which they fit very close; they are sometimes red, and at others white, and both colours are often on the same plant. This sort may be propagated in the same way as the former.

The tenth sort grows naturally in the island of *Crete*, and also about *Nice* in *Italy*; this is a perennial plant with a low shrubby stalk, sending out many four-cornered branches, garnished with oval leaves, woolly on both sides, and are bluntly crenated on their borders. The upper parts of the branches are adorned with purple flowers in whorls, having two small oval entire leaves under each whorl; the flowers are as large as those of the first sort, but their cups are very woolly, and their indentures end in sharp points. When the season proves warm and dry, the plants will produce good seeds in *England*.

This may be propagated either by seeds or cuttings, in the same way as the two first sorts; but the plants should have a dry soil and a warm situation, otherwise they will not live through the winter in the open air in *England*.

The eleventh sort grows naturally on the *Alps*; this is like the seventh sort, but the stalks and leaves are very hairy, sawed toward their points, hoary on their under side, and fit close to the branches. The flowers are larger than those of the seventh sort, and are of a paler red colour. The seeds ripen in *August*.

This may be propagated by seeds or parting of the roots, in the same manner as the seventh.

The twelfth sort is the common wild or Wood Sage, which grows naturally in woods and thickets in many parts of *England*, so is rarely admitted into gardens; this has a creeping perennial root, from which arise stiff, ligneous, four-cornered stalks, a foot and a half high, garnished at each joint by two heart-shaped leaves placed opposite; slightly sawed on their edges, and stand upon foot-stalks. The upper part of the stalks have three or four long spikes of flowers, which incline to one side of the stalk; they are of an herbaceous white colour, and the stamina are terminated by purple summits. It flowers in *July*, and the seeds ripen in autumn. This plant will grow in any soil or situation, and was formerly used in medicine.

The thirteenth sort is the common Water Germander, which grows naturally in the isle of *Ely*, and some other fenny parts of *England*; it has a small, stringy, fibrous, creeping root, which is perennial, from which arise many four-cornered, trailing, diffused stalks, garnished with oblong, hairy, indented leaves, sitting close to the stalks. The flowers are produced at the wings of the stalks, two arising on each side, at every joint; they are of a purple colour, and fit very close to the bottom of the leaves; these appear in *July*, but are seldom succeeded by seeds. The whole plant has an odour like that of Garlick. The herb is used in medicine.

This plant may be propagated by its creeping roots, or planting the young shoots in the spring, in the same man-

ner as Mint, Penny Royal, &c. and should have a moist soil, otherwise it will not thrive in gardens.

The fourteenth sort is the common or *Syrian* Marum, which grows naturally in *Syria*, and also in the kingdom of *Valencia*; this has a low shrubby stalk, sending out many ligneous branches, which in warm countries will rise three or four feet high, but in *England* it is rarely seen half that height. The stalks are very hoary, garnished with small oval leaves opposite at each joint, about the size of those of Thyme, and are pointed at both ends; they are hoary, and have a piercing grateful scent, so quick as to cause sneezing. The flowers grow in loose whorled spikes at the end of the branches, of a bright red colour; they appear in *July* and *August*, but are not succeeded by seeds in *England*.

This plant is easily propagated by slips or cuttings, which, if planted during the summer months on a bed of light loamy earth, covering them down close either with bell or hand-glasses, and shading them from the sun, will put out roots very freely. When these have made good roots, they may be transplanted either into separate small pots, or on a warm border at about six inches distance every way, observing to shade them from the sun, and supply them with water till they have taken new root; after which they will require no other care, but to keep them clean from weeds. These plants will live through the winter in the open air, if they are planted in a dry soil and a warm situation, when the frosts are not very severe; but in very hard winters they are frequently killed, if they are not protected by mats or some other covering. There was, about forty years ago, a great number of these plants growing in the warm borders of the royal gardens at *Kenfington*, which were clipped into conical forms, and were near three feet high; but now there are few plants of a large size to be found in the *English* gardens, because their branches are annually cut to keep them short.

The cats are very fond of this plant, and where there are but few of these plants will destroy them, unless they are protected from them; but where there is a great number of the plants together, the cats seldom touch them.

The fifteenth sort is the common Ground Pine, which is used in medicine; it grows naturally on chalky arable land, in several parts of *England*; it is an annual plant, with a single ligneous root, sending out a few slender fibres from the side, from which arise many weak, trailing, hairy stalks, garnished with narrow leaves ending with three points, set by pairs and cross each other at every joint; they are hairy, and, when bruised, emit a strong resinous odour. The flowers sit close to the stalks at the wings of the leaves; there are two or three of them at each joint, of a bright yellow colour, and shaped like the other species. If the seeds are permitted to scatter, the plants will come up better than if sown, and require no other care but to thin them, and keep them clean from weeds.

This plant is greatly recommended for its virtues; there is scarce a better herb than this for opening obstructions; it is a strong diuretick, and an excellent remedy for the rheumatism.

The sixteenth sort grows naturally in the south of *France*, in *Italy*, and *Spain*; it is an annual plant, with a single ligneous root sending out a few fibres. The stalks are about six inches high, closely garnished with very hairy narrow leaves, which are indented towards their points. The flowers come out from the wings of the stalks, to which they fit very close; they are large, of a bright purple colour, and appear in *July*, but unless the season proves favourable, they are not succeeded by seeds in *England*.

The seventeenth sort grows naturally about *Nice* in *Italy*; this is also an annual plant, much like the former, but the leaves are narrower and entire. The whole plant is covered

vered with white woolly hairs, and the flowers are smaller than those of the former.

Both these plants succeed best, if, when they perfect their seeds, they are permitted to scatter in the same manner as the fifteenth sort; or, if the seeds are sown, it should be in autumn, for they rarely succeed when they are sown in the spring.

The eighteenth sort was discovered by the late Dr. *Houfston*, growing naturally at *La Vera Cruz*; this is an annual plant, with an erect four-cornered stalk a foot and a half high, garnished with smooth, oblong, oval leaves, which are bluntly indented. The flowers come out from the wings of the stalks, two of them arising at each joint, upon short slender foot stalks; they are small and white, having short empalements, which are cut at the brim into five very acute points. The flowers appear in *July*, and are succeeded by seeds which ripen in autumn.

The nineteenth sort was discovered by the late Dr. *Houfston*, at the same place with the former; this is also an annual plant, with a slender, upright, four-cornered stalk, which rises three feet high, and divides into several smooth branches, garnished with oval spear-shaped leaves, three inches long and one broad, of a bright green on their upper side, but pale on their under; they are unequally sawed on their edges, and stand upon long foot-stalks. The flowers come out in long bunches from the wings of the stalk and also at the top; they are pretty large, white, and have bladdered empalements; these appear late in *July*, and, unless the season proves favourable, they will have no good seeds succeed them.

The two last sorts are tender, so will not thrive in the open air in *England*; and, unless the season proves warm, they will not perfect their seeds here. The seeds of these should be sown in small pots in autumn, which should be plunged into the tan-bed in the stove between the other pots, where they should remain till spring, and then they may be taken out, and plunged into a hot bed, which will bring up the plants. When these are fit to remove, they should be each planted in a separate pot, and plunged into a hot bed, and afterward treated in the same way as other tender plants which require constant shelter.

THALICTRUM. *Tourn. Inst. R. H. 270. tab. 143.* Meadow Rue.

The Characters are,

The flower has no empalement, but has four or five roundish concave petals, which fall off soon, and a great number of broad stamina, which are compressed toward their tops, terminated by twin summits, with several very short styles sitting singly upon roundish germen, crowned by thick stigmas. The germen afterward turn to so many keel shaped capsules collected in a head, each containing one oblong seed.

The Species are,

1. THALICTRUM caule folioso sulcato, paniculâ erectâ. *Hort. Cliff. 226.* Meadow Rue with a furrowed leafy stalk, and many erect panicles of flowers.

2. THALICTRUM caule anguloso, foliis linearibus bifidis trifidisque, paniculâ multiplici erectâ. Meadow Rue with an angular stalk, narrow leaves ending in two or three points, and many erect panicles of flowers.

3. THALICTRUM fructibus pendulis triangularibus reëtis, caule tereti. *Lin. Sp. Plant. 547.* Meadow Rue with a pendulous triangular fruit, and a taper stalk; commonly called Feathered Columbine.

4. THALICTRUM caule folioso sulcato, foliis linearibus carnosis. *Dalib. Prif. 162.* Meadow Rue with a furrowed leafy stalk, and linear fleshy leaves.

5. THALICTRUM floribus pentapetalis, radice fibrosâ. *Flor. Leyd. Prod. 486.* Meadow Rue with flowers having five petals, and a fibrous root; *Canada Meadow Rue.*

6. THALICTRUM floribus pentapetalis, radice tuberosâ.

Hort. Cliff. 227. Meadow Rue with flowers having five petals, and a tuberous root.

7. THALICTRUM foliis sexpartitis, floribus cernuis. *Lin. Sp. Plant. 546.* Meadow Rue with leaves cut into six segments, and pendulous flowers.

8. THALICTRUM caule paniculato ramosissimo folioso. *Lin. Sp. Plant. 545.* Meadow Rue with a very branching paniculated leafy stalk; the least stinking Meadow Rue.

9. THALICTRUM floribus dioicis. *Lin. Sp. Plant. 545.* Meadow Rue with male and female flowers upon different plants.

10. THALICTRUM foliolis lanceolato-linearibus integerrimis. *Hort. Cliff. 226.* Meadow Rue with spear-shaped linear leaves, which are entire.

11. THALICTRUM caule simplicissimo subnudo, racemo simplici terminali. *Hort. Cliff. 227.* Meadow Rue with a single stalk, which is almost naked, and terminated by a single bunch of flowers.

The first sort grows naturally by the side of rivers and in moist meadows in many parts of *England*. This has a yellow creeping root, from which arise several furrowed stalks four or five feet high, garnished at each joint with leaves composed of many lobes, which differ in their form and size; some are spear-shaped and entire, others are obtuse, and cut into three points; they are of a deep green colour on their upper side, but pale on their under. The flowers are of an herbaceous white colour, and formed into many panicles, standing erect on the top of the stalks. These appear in *July*, and are succeeded by short triangular capsules containing one oblong seed.

The second sort grows naturally in the meadows about *Montpelier*. The root of this is like the former; the stalks are angular, and rise five feet high; they are better furnished with leaves, whose lobes are very narrow, some of them ending with two, and others with three points, of a bright green colour. The flowers are yellow, and are formed into many panicles which terminate the stalks. This sort flowers about the same time with the former.

The third sort grows naturally upon the *Alps*; of this there are two varieties; one with a green stalk and white stamina, the other has purple stalks and stamina. These two are propagated in gardens, by the title of Feathered Columbine; this has a thick fibrous root, the stalks are taper and rise three feet high; the leaves are like those of the Columbine. The flowers grow in large panicles at the top of the stalk. It flowers in *June*, and the seeds, which are in triangular capsules, ripen in *August*.

The fourth sort grows naturally in the meadows about *Paris*; this hath upright channelled stalks, which rise three feet high, garnished at each joint with winged leaves composed of many linear fleshy lobes, which are for the most part entire, ending in acute points. The flowers are of a yellowish white colour; they appear in *July*, and are succeeded by small angular capsules, with one small oblong seed in each, which ripens in *August*.

The fifth sort grows naturally in *North America*; this has a fibrous root of a dark colour. The stalks are smooth, of a purple colour, and rise three or four feet high, branching toward the top. The leaves are like those of Columbine, of a grayish colour, and smooth. The flowers are produced in large panicles at the top of the stalks; they are larger than those of the former sorts, and have five white petals which soon fall off, and a great number of white stamina with yellow summits. This flowers in *June*, and the seeds ripen in *August*.

The sixth sort grows naturally in *Spain*; this has knobbed roots; the leaves are small, obtuse, and indented in three parts at their points; they are of a grayish colour and smooth. The stalks rise a foot and a half high, naked almost to the top, where they divide into two or three

small ones, under which is situated one leaf. Each division of the stalk is terminated by a small bunch of pretty large flowers, having five white petals. The flowers are almost disposed in form of an umbel. They appear in *June*, and are succeeded by small angular capsules, containing one oblong seed in each, which ripen in *August*.

The seventh sort grows naturally in some parts of *Cambridgehire*; this has a creeping fibrous root. The stalks rise about a foot high, and are garnished with winged leaves composed of many obtuse short lobes, which are cut into six segments. The stalks branch out wide; the flowers grow in loose panicles; they are small and nodding. The stamina are of an herbaceous white, and the summits are yellowish. It flowers in *June*.

The eighth sort grows naturally in the south of *France*; this hath a very branching stalk, which rises about six or seven inches high, garnished with winged leaves which are downy, composed of a great number of small lobes which are bluntly indented, and have a foetid scent. The flowers grow in loose panicles, they are small, of an herbaceous white colour, with yellowish stamina. This flowers in *June*.

The ninth sort grows naturally in *North America*. The root of this is fibrous; the stalks rise near a foot high, and are almost naked to the top, where they have one leaf, composed of many small lobes of a grayish colour, indented at their points. The flowers are produced in small bunches at the top of the stalks; they are male and female in different plants. These appear in *June*.

The tenth sort grows naturally in *Italy* and some parts of *Germany*; this hath a perennial root. The stalks rise from two to three feet high; the leaves are winged like those of the other sorts; their lobes are narrow and entire. The flowers are small, and are collected in panicles at the top of the stalks, and are of an herbaceous white colour.

The eleventh sort grows naturally on the *Alps*; this hath a fibrous creeping root: the leaves are small, blunt, and of a grayish colour. The stalks rise about six inches high, and are almost naked; they are terminated by a loose single spike of flowers, each having four petals. This flowers the latter end of *April* or the beginning of *May*.

These plants are generally propagated by parting their roots. The best time for this work is in *September*, when their leaves and stalks begin to decay, that they may take fresh root before the frost comes on to prevent them; they should also be planted in a fresh light soil, and have a shady situation, in which they will thrive exceedingly, though they may be planted in almost any soil or situation, provided it be not too hot and dry; but most of them creep so much under ground, as to become very troublesome in a garden, for which reason there are but few of the sorts admitted into gardens. The third, fifth, and sixth sorts are frequently cultivated in gardens. The roots of these do not creep like the others, and their flowers have some beauty to recommend them, but the others are only kept in botanick gardens for the sake of variety; therefore when they are admitted, their roots should be confined in pots, otherwise they cannot be kept within bounds.

THAPSIA. *Journ. Inst. R. H.* 321. tab. 171. The deadly Carrot, or scorching Fennel.

The Characters are,

It has an umbellated flower; the general umbel is large, composed of about twenty rays which are nearly equal, these have no involucri; the general umbel is uniform. The flowers have five spear-shaped incurved petals, and five hair-like stamina the length of the petals, terminated by single summits. It has an oblong germen situated under the flower, supporting two short styles crowned by obtuse stigmas. The germen afterward becomes an oblong fruit, girt with a longitudinal membrane dividing into two parts, each containing one oblong seed, pointed at both ends, having plain borders on both sides.

The Species are,

1. THAPSIA *foliolis dentatis basi coadunatis*. Hort. Cliff. 105. Scorching Carrot, with indented lobes which are joined at their base.

2. THAPSIA *foliis pinnatis, foliolis latissimis pinnatifidis subtus villosis petiolis decurrentibus*. Scorching Carrot with winged leaves, having very broad wing-pointed lobes, which are hairy on their under side, and running foot-stalks.

3. THAPSIA *foliolis multifidis basi angustatis*. Hort. Cliff. 105. Scorching Carrot with many-pointed lobes, which are narrowed at their base.

4. THAPSIA *foliolis multifidis setaceis*, Hort. Cliff. 106. Scorching Carrot with many-pointed bristly lobes.

5. THAPSIA *foliis ternatis ovatis*. Lin. Sp. Plant. 262. Scorching Carrot with oval trifoliate leaves.

6. THAPSIA *foliolis multifidis acutis, subtus villosis, petiolis bispidis*. Scorching Carrot with many pointed acute lobes, which are hairy on their under side, and have hairy foot-stalks.

The first sort grows naturally in *Spain*, *Portugal*, and the south of *France*; this hath a thick fleshy root in shape of a Carrot, which has an outward blackish skin; the inside is white, bitter, and very acrid, with a little aromack taste. The leaves are winged; the lobes are thick, hairy, and indented; they are regularly cut into opposite segments like other winged leaves. The stalk is spongy, and rises about two feet high, dividing upward into two or three small branches, each being terminated by a large umbel of yellow flowers. These appear in *June*, and are succeeded by large, flat, bordered seeds, which ripen in *August*.

The second sort grows naturally in *Spain*, particularly all over *Old Castile*, quite to the *Pyrenean* mountains. The root of this sort is large, thick, and of a dark colour without. The leaves are very thick, and hairy on their under side; they spread circularly on the ground, and are divided into broad lobes, like most of the other umbelliferous plants. The stalks rise three or four feet high; they are large, jointed, and full of pith, having one leaf at each joint, shaped like those at the bottom, but are smaller as they are nearer the top. The stalk is terminated by a large umbel of yellow flowers, which appear the latter end of *June*, and the seeds ripen two months after.

The third sort grows naturally in *Italy* and *Spain*. The leaves of this sort are cut into many narrow segments, almost as small as those of the Garden Carrot, but are rough and hairy; their segments are always opposite, and are narrower at their base than their points. The stalks rise about two feet high, and are terminated by umbels of small yellow flowers which appear in *July*; these are succeeded by flat bordered seeds, which ripen the beginning of *September*.

The fourth sort grows naturally in *Apulia*. The root of this is about the thickness of a man's thumb; the bark is yellow and wrinkled, the inside white, and abounds with an acrid milky juice; the leaves are finely divided like those of Fennel; they are hairy, and sit close to the root. The stalk rises from two to three feet high; it is naked, and branches into two or three stalks, each being terminated by a small umbel of flowers, which are large, yellow, and appear in *July*; these are succeeded by flat seeds, having cartilaginous borders, which ripen in *September*.

The fifth sort grows naturally in *North America*. The seeds were sent me by Dr. *Bensel* from *Philadelphia*. This has a slender tap-root, which is shaped like those of Parsley; the leaves at the bottom are heart-shaped. The stalk is single, and does not branch; it rises near two feet high, is of a purple colour, and slender, garnished at each joint with one trifoliate leaf, whose lobes are oval and crenated. The stalk is terminated by a small umbel of purple flowers, which appear in *July*, and are succeeded by compressed chan-

channelled seeds which ripen in *September*. Dr. Gronovius thinks this plant very like that which is figured by *Kempfer*, by the title of *Nindzi*.

The sixth sort grows naturally in *Austria*; this has a taper root as large as a man's thumb. The leaves spread circularly on the ground, and are divided into several parts; the lobes are very small, cut into many acute segments or points, which are opposite like winged leaves; they are rough and hairy. The foot-stalks of the leaves are broad, and are closely set with prickly hairs; the stalk rises near two feet high, and is terminated by an umbel of yellow flowers, which appear in *July*, and are succeeded by bordered compressed seeds, which ripen in *September*.

These plants are only propagated by seeds, which should be sown in autumn; for if they are kept out of the ground till spring, they often miscarry; or if they grow, they commonly lie a whole year in the ground before the plants come up; whereas those seeds which are sown in autumn, generally grow the following spring. These should be sown in drills, in the place where they are designed to remain. The drills should be at least two feet and a half asunder, because the plants spread their leaves very wide. When the plants come up in the spring, they must be carefully cleared from weeds; and where they are too close together, some of them should be drawn out, to give room for the others to grow; but at this time they need not be left more than two or three inches apart; for the first year the plants arise from seeds, they make but slow progress, so the autumn following the remaining part of the plants may be taken up, leaving those which are designed to remain about eighteen inches asunder; and those plants which are taken up, may be transplanted into another bed, if they are wanted. After the first year these plants will require no farther care, but to keep them clean from weeds; and every spring, just before the plants begin to push out new leaves, the ground should be carefully dug between them, to loosen it, but the roots must not be injured, lest it should cause them to decay. The plants being thus managed, will continue several years, and produce flowers and seeds annually, from which new plants may be raised. They delight in a soft loamy soil, and if they are exposed only to the morning sun, they will thrive better than if they have a warmer situation, for they endure the cold of our winters very well.

The roots of the third sort were formerly used in medicine, but are now never ordered, being supposed to have a poisonous quality. *Boerhaave* says it has much the same qualities as *Euphorbium*; it burns the bowels, and produces a diarrhoea.

THELIGONUM. *Lin. Gen. Plant.* 947. Dogs Cabbage.

The Characters are,

It has male and female flowers on the same plant. The male flowers have a turbinated empalement of one leaf, cut into two segments, which turn backward. It has no petal, but several erect stamina the length of the empalement, terminated by single summits. The female flowers have a small bifid empalement of one leaf, which is permanent. It has no petals, but has a globular germen, supporting a short style, crowned by an obtuse stigma. The germen afterward becomes a thick globular capsule with one cell, inclosing one globular seed.

We have but one Species of this genus, viz.

THELIGONUM. *Sauv. Monsp.* 129. This is the Cynocrambe, or Dogs Cabbage of *Dioscorides*.

This plant grows naturally in the south of *France*, in *Italy*, and *Tartary*. It is annual. The stalks trail on the ground like those of *Chickweed*; they grow about a foot long; their joints are pretty close, garnished with oval acute-pointed leaves, standing on pretty long foot-stalks,

which are bordered. At each joint is placed one of these leaves, and from the same point come out several smaller, of the same shape, on shorter foot-stalks. The flowers are produced from the wings of the stalk in clusters, sitting very close; they are small, of an herbaceous white colour, so make no great appearance. The male and female flowers grow from the same joint. The female flowers are succeeded by a single roundish seed, which ripens in autumn.

It is preserved in botanick gardens for the sake of variety. The seeds of this must be sown in autumn, in the place where the plants are to remain; for when they are sown in the spring, the plants rarely come up the same year. They require no other culture but to keep them clean from weeds, and thin them where they are too close.

THEOBROMA. *Lin. Gen. Plant.* 806. Bastard Cedar.

The Characters are,

The empalement of the flower is composed of three oval concave leaves, which are reflexed. The flower has five oval petals, which spread open, and are hollowed like a spoon; from the top of each petal comes out a bifid bristly ligula, divided like two horns. It has a great number of short stamina joined in five bodies, which are terminated by roundish summits, and a roundish germen, supporting a single style the length of the petals, crowned by a single stigma. The germen afterward turns to a roundish fruit with five angles, opening in five cells, each containing several seeds.

We have but one Species of this genus, viz.

THEOBROMA foliis serratis. *Hort. Cliff.* 379. Theobroma with sawed leaves.

This grows naturally in most of the islands in the *West-Indies*, where it rises to the height of forty or fifty feet, having a trunk as large as a middle-sized man's body, covered with a dark brown furrowed bark, sending out many branches toward the top, which spread wide on every hand, garnished with oblong heart-shaped leaves, placed alternate, of a bright green on their upper side, and pale on their under, sawed on their edges, with a strong midrib, and several transverse veins, standing upon short foot-stalks. The flowers come out in bunches from the wings of the leaves; they are small, of a yellow colour, having five concave petals, which spread open circularly, and a great number of stamina, which at their base are joined in five bodies, terminated by roundish summits. In the center is situated a roundish germen, supporting a slender style the length of the stamina, crowned by a single stigma. The germen afterward turns to a roundish warted fruit, having five obtuse angles, and five cells, which contain several irregular seeds.

The wood of this tree is white and ductile, so is frequently cut into staves for casks. The fruit and leaves are good fodder for cattle, therefore when the planters clear the land from wood, they leave the trees of this sort standing for the feed, which is of great use in dry seasons, when the common fodder is scarce.

There are some plants of this sort in *England* preserved in the gardens of curious persons; it is propagated by seeds, which must be procured as fresh as possible, from the countries where the plants grow naturally. These should be sown upon a good hot-bed in the spring; and when the plants are fit to remove, they should be each planted in a separate small pot, and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken new root; then they should be treated in the same way as the *Coffee-tree*, keeping them always in the tan-bed in the stove.

THERMOMETERS, or THERMOSCOPES, are instruments of very great use to gardeners in the management of stoves. They shew, by inspection, the present condition of the air, whether it be hot or cold; which day in summer is the hottest, and in the winter which is the coldest,

er any part of the day; and from thence many useful experiments have and may be made, *viz.* how much one spring exceeds another in coldness; which baths are the hottest or coldest; and, if being held in the hand of a person in a fever, or otherwise applied, will nicely shew the abatement or increase of a fever.

The common thermometer, which is used for hot-houses, has a tube of about two feet in length, and about the eighth part of an inch diameter; and in this it is remarked, that the air is cold for the plants when the spirit rises to fifteen inches above frost; that it is temperate at sixteen inches and a half; that it is warm when it rises to eighteen inches, which is the standard for Pine-apple heat. It is marked for hot air at twenty inches, and sultry hot at twenty-one and a half; but in the common thermometers, these degrees are differently marked; this temperate air is about our warm, this warm air our hot, and our hot air is about the same as the sultry.

These thermometers are marked with the names of some of the remarkable plants which are preserved in the hot-houses; but as the number of these plants has been greatly increased in *England* of late years, I have directed some thermometers to be made with a scale, divided into degrees, and with three different points of heat marked in classes, which correspond with these thermometers; and under each class, I have drawn up lists of the several plants, ranged according to the degrees of heat in which they are found to succeed, whereby the culture of them is made easy to persons of small skill.

By this means every gardener may know when it is proper to apply his heat in its full force, and what degree of heat ought to be used for the welfare of any plant from any part of the world.

Mr. *Boyle*, by placing a thermometer in a cave, which was cut strait into the bottom of a cliff, fronting the sea, to the depth of 130 feet, found the spirit stood, both in winter and summer, at a small division above temperate; the cave had 80 feet depth of earth above it.

I, says Dr. *Hales*, marked six thermometers numerically, 1, 2, 3, 4, 5, 6. The thermometer, number 1, which was the shortest, I placed with a south aspect in the open air; the ball of number 2, I set two inches under ground; that of number 3, four inches; number 4, eight inches; number 5, sixteen inches; and number 6, twenty-four inches: and that the heat of the earth at those several depths may the more accurately be known, it is proper to place near each thermometer a glass tube, sealed at both ends, of the same length with the stems of the several thermometers, and with tinged spirit of wine in them to the same height as in each corresponding thermometer; the scale of degrees of each thermometer being marked on a sliding ruler, with an index to the back of it, pointing to the corresponding tube.

When at any time an observation is to be made, by moving the index to point to the top of the spirit in that tube, an accurate allowance is hereby made for very different degrees of heat and cold in the stems of the thermometers at all depths; by which means the scale of degrees will shew truly the degrees of heat in the balls of the thermometers, and consequently the respective heats of the earth at the several depths where they are placed.

The stems of these thermometers, which were above the ground, were fenced from weather and injuries, by square wooden tubes. The ground they were placed in, was a brick earth in the middle of my garden.

July the 30th he began to keep a register of their rise and fall: during the following month of *August* he observed, that when the spirit in the thermometer, number 1, (which was exposed to the sun) was about noon risen to 48 de-

grees, then the second thermometer was 45, the fifth 33, and the sixth 31; the third and fourth at intermediate degrees: the fifth and sixth thermometers kept nearly the same degree of heat, both night and day, till towards the latter end of the month, when, as the days grew shorter and cooler, and the nights longer and cooler, they then fell to 25 and 27 degrees.

Now so considerable a heat of the sun, at two feet depth under the earth's surface, must needs have a strong influence in raising the moisture at that and greater depths, whereby a very great and continual reek must always be ascending during the warm summer season, by night as well as by day, for the heat at two feet deep is nearly the same night and day, the impulse of the sun-beams giving the moisture of the earth a brisk undulating motion; which watery particles, when separated and rarefied by heat, ascend in the form of a vapour; and the vigour of the warm and confined vapour (such as is that which is one, two, or three feet deep in the earth) must be very considerable, so as to penetrate the roots with some vigour, as we may reasonably suppose from the vast force of confined vapour in *Eolipiles*, in the *Digester of Bones*, and the engine to raise water by fire.

If plants were not in this manner supplied with moisture, it were impossible for them to subsist under the scorching heats within the tropicks, where they have no rain for many months together; for though the dews are much greater there than in these more northern climates, yet, doubtless, where the heat so much exceeds ours, the whole quantity, evaporated in a day there, does as far exceed the quantity that falls by night in dew, as the quantity evaporated here in a summer's day is found to exceed the quantity of dew which falls in the night.

But the dew which falls in the hot summer season, cannot possibly be of any benefit to the roots of trees, because it is remanded back from the earth by the following day's heat, before so small a quantity of moisture can have soaked to any considerable depth.

The great benefit therefore of dew in hot weather must be, by being plentifully imbibed into vegetables, thereby not only refreshing them for the present, but also furnishing them with a fresh supply of moisture towards the great expences of the succeeding day.

It is therefore probable, that the roots of trees and plants are thus, by means of the sun's warmth, constantly irrigated with fresh supplies of moisture, which, by the same means, insinuates itself with some vigour into the roots; for if the moisture of the earth were not thus actuated, the roots must then receive all their nourishment merely by imbibing the next adjoining moisture from the earth; and consequently the shell of the earth, next the surface of the roots, would always be considerably drier the nearer it is to the root, which I have not observed to be so.

But when, towards the latter end of *October*, the vigour of the sun's influence is so much abated, that the first thermometer was fallen to three degrees above the freezing point, the second to ten degrees, the fifth to fourteen degrees, and the sixth to sixteen degrees; then the brisk undulations of the moisture of the earth, and also of the ascending sap, much abating, the leaves faded and fell off.

The greatest degree of cold, in the following winter, was in the first twelve days of *November*; during which time, the spirit in the first thermometer was fallen four degrees below the freezing point, the deepest thermometer ten degrees; the ice on ponds was an inch thick; the sun's greatest warmth, at the winter solstice, in a very serene, calm, frosty day, was, against a south aspect of a wall, 19 degrees, and, in a free open air, but 11 degrees above the freezing point.

From the 10th of *January* to the 29th of *March* was a very

very dry season, when the green Wheat was generally the finest that was ever remembered: but from the 29th of March 1725, to the 29th of September following, it rained more or less every day, except ten or twelve days about the beginning of July; and that whole season continued so very cool, that the spirit in the first thermometer rose but to 24 degrees, except now and then a short interval of sun-shine; the second only to 20 degrees, the fifth and sixth to 24 and 23 degrees, with very little variation; so that, during this whole summer, those parts of roots which were two feet under ground, had three or four degrees more warmth than those which were but two inches under ground; and, at a medium, the general degree of heat through this whole summer, both above and under ground, was not greater than the middle of the preceding September.

THLASPI. *Town. Infl. R. H. 212. tab. 101.* Mithridate, or Treacle Mustard.

The Characters are,

The empalement of the flower is composed of four oval concave leaves, which fall off. The flower has four oval petals, double the size of the empalement, placed in form of a cross; it has six stamina half the length of the petals, two of which are shorter than the others, terminated by acute summits, and a roundish compressed germen, supporting a single style the length of the stamina, crowned by an obtuse stigma. The germen afterward becomes an oval, heart-shaped, compressed little pod, with an acute border, divided into two cells by an intermediate partition, containing two or three seeds in each.

The Species are,

1. THLASPI *filiculis subrotundis, foliis sagittatis dentatis incanis.* Hort. Cliff. 330. Mithridate Mustard with roundish pods, and arrow-pointed, hairy, and indented leaves.

2. THLASPI *filiculis orbiculatis, foliis oblongis dentatis glabris.* Flor. Lapp. 251. Treacle Mustard with orbicular pods, and oblong, indented, smooth leaves; Treacle Mustard, or Penny Cress.

3. THLASPI *filiculis subrotundis, foliis oblongo-cordatis amplexicaulibus integerrimis.* Treacle Mustard with roundish pods, and oblong, heart-shaped, entire leaves, which embrace the stalks.

4. THLASPI *filiculis suborbiculatis, foliis lanceolatis integerrimis.* Hort. Cliff. 330. Treacle Mustard with leaves which are almost orbicular, and spear-shaped entire pods.

5. THLASPI *filiculis subovatis ventricosus, foliis oblongis obtusis dentatis glabris.* Prod. Leyd. 334. Treacle Mustard with almost oval swelling pods, and oblong, blunt, smooth, indented leaves.

6. THLASPI *filiculis subrotundis pilosis, foliis caulinis sagittatis hirsutis.* Prod. Leyd. 333. Treacle Mustard with roundish hairy pods, and hairy arrow-pointed leaves on the stalks.

7. THLASPI *filiculis obcordatis, foliis radicalibus cuneiformibus integerrimis.* Lin. Sp. Plant. 647. Treacle Mustard with heart-shaped pods, and the lower leaves wedge-shaped and entire.

8. THLASPI *filiculis ellipticis, foliis lanceolato-linearibus integerrimis.* Saw. Monsp. 53. Treacle Mustard with elliptical pods, and linear, spear-shaped, entire leaves.

The first sort grows naturally amongst the Corn in divers parts of England, as also on the side of dry banks; it is a biennial plant, which perishes soon after it has ripened its seeds. The root is composed of ligneous fibres, which spread in the ground; the bottom leaves are long, narrow at their base, and broader toward their points, where they have several indentures, and are hoary on both sides. The stalk rises about a foot high, branching toward the top, and is pretty closely garnished with leaves, placed alternately, whose ears embrace the stalk. The flowers are produced in short spikes at the end of the stalks; they are

small, white, and composed of four petals, placed in form of a cross; these are succeeded by roundish capsules, having two cells, containing two or three seeds in each. The whole plant has a warm biting taste. The seeds of this are frequently used instead of those of the next, which is the sort directed to enter the composition of Venice Treacle.

The second sort is an annual plant, which grows naturally in several parts of England: I have found it growing in plenty in the meadows on the right hand side of Gedolming. The root of this is composed of slender fibres; the stalk rises a foot high, is angular, channelled, and smooth; the leaves are smooth and indented, of a deep green colour, and sit close to the stalks; the flowers are produced in loose spikes toward the upper part of the stalks, which are small, white, and composed of four petals, placed crosswise like the former; these are succeeded by broad, flat, roundish, compressed pods, having leafy borders, which have two cells, each containing two or three dark brown seeds, tasting like Garlick. The seeds are an ingredient in Theriaca.

The third sort is an annual plant, which grows naturally in the northern counties of England. Of this there are two sorts mentioned in books, which differ only in size, so that I believe it is owing to the different soils in which they grow; for I have frequently sown the seeds of both in the garden, where, when the plants came up, they have proved to be the same. The stalks of this rise about nine inches high, divided at the top into several branches, which are clothed with smooth, oblong, heart-shaped, entire leaves, whose base embrace the stalks. The flowers are small, white, and are produced in loose short spikes at the end of the branches.

The fourth sort grows naturally in Sicily; this is a biennial plant, whose stalks rise eight or nine inches high, branching out toward the top, garnished with blunt thick leaves, of a grayish colour, which are spear-shaped and entire, placed opposite, sitting close to the stalk; they have a bitter warm taste. The flowers are produced in loose spikes at the top of the stalks; they are small, and of a purple colour, having four heart-shaped petals, placed in form of a cross; these are succeeded by heart-shaped pods, of a fine green colour, which are divided into two cells, each containing three or four small, oblong, yellowish seeds, which have an acrid taste.

The fifth sort is an annual plant, which grows naturally in the northern parts of Europe; this rises about six or eight inches high. The stalk branches toward the top, and is garnished with oblong, smooth, blunt leaves, which are a little indented; these sit close to the stalk, which, if bruised, have a strong scent of Garlick. The branches are terminated by loose spikes of small white flowers, composed of four roundish petals, placed in form of a cross, and are succeeded by swelling roundish pods, containing a few dark brown seeds.

The sixth sort grows naturally in Wales, and in a few places in England; this has a perennial creeping root. The lower leaves are oblong and hoary; they are very slightly sinuated on the edges. The stalks are about five or six inches long, and incline toward the ground; the flowers are rather larger than those of the first sort, but are of the same form; the pods are hoary, but not hairy. This grows naturally on the side of a bank beyond Wandsworth in the road to Putney.

The seventh sort grows naturally upon the Alps, and in some parts of Yorkshire in dry stony pastures. The root of this is perennial and creeping; the stalks rise four or five inches high; the lower leaves are wedge-shaped, being broad and rounded at their points, but narrow at their base, of a deep green colour, and entire; those upon the stalks

are rounder, and sit very close. The flowers are produced in loose spikes at the end of the branches; they are small and white, shaped like those of the other sorts, which are succeeded by roundish heart-shaped pods, divided into two cells, each containing two or three brown seeds.

The eighth sort grows naturally in rocky places in the south of *France*, in *Spain*, and *Italy*; it is a biennial plant with us. The root is composed of ligneous tough fibres, which penetrate the crevices of the rocks; the lower leaves are roundish, fleshy, and entire; the stalks rise about five inches high, and divide into small branches, garnished with fleshy, linear, spear-shaped, entire leaves, of a deep green colour, having smooth surfaces. The flowers grow in loose spikes at the end of the branches; they are of a beautiful red colour, with some dark bloody stripes; these are succeeded by oblong elliptical pods, which contain several small red seeds.

These plants are propagated by seeds, which should be sown where the plants are to remain; this may be performed either in the spring or autumn, but the latter is to be preferred, because the seeds at that season never fail, and the plants, which come up before winter, will grow much stronger, and produce a greater quantity of seeds than those which are sown in the spring, especially if the season proves dry; and there is very little danger of the plants being injured by frost in winter, if they are upon dry ground. When the plants come up, they will require no other care but to thin them where they are too close, and keep them clean from weeds.

The two sorts which are first mentioned, may be cultivated for their seeds to be used in medicine, so may be sown thin upon beds of light ground, in the same way as for other garden plants; and when they come up, the ground should be hoed to destroy the weeds; and where the plants are too thick, they should be cut up in the same manner as is practised for Onions, Carrots, &c. leaving them three or four inches apart; and by twice hoeing the ground, if it is well performed, and in dry weather, it will keep the ground clean till the seeds are ripe.

The other sorts are seldom cultivated but in botanick gardens for variety, so a few plants of each will be sufficient; therefore these may be sown in drills, and when the plants come up, they must be thinned, and kept clean from weeds. If the seeds of these plants are permitted to scatter, the plants will come up without care.

THISTLE. See *Carduus*.

THORN APPLE. See *Datura*.

THORN, the *Glastenbury*. See *Mespilus*.

THUYA. *Tourn. Inst. R. H. 586. tab. 358.* The *Arbor Vitæ*.

The *Characters* are,

It has male and female flowers in the same plant; the male flowers are produced in an oval katkin, placed opposite upon the common foot stalk, each flower embracing it with its base; these come out of an oval concave scale; they have no petals, but have four stamina, which are scarce discernible; their summits adhere to the base of the scale of the empalment. The female flowers are collected in a common almost oval cone, two flowers standing opposite in each scale; they have no petals, but have a small germen, supporting a slender style, crowned by a single stigma; these are succeeded by an oblong oval cone, opening longitudinally, whose scales are almost equal, convex on the outside, and obtuse, each containing an oblong seed.

The *Species* are,

1. THUYA *strobilis lævibus, squamis obtusis.* Hort. Cliff. 449. Thuya with smooth cones, and obtuse scales. This is the common *Arbor Vitæ*.

2. THUYA *strobilis squarrosis, squamis acuminatis reflexis.* Hort. Upsal. 289. Thuya with rugged cones, and acute-pointed reflexed scales; or *China Arbor Vitæ*.

The first sort grows naturally in *Canada*, *Siberia*, and other northern countries. In some of the *English* gardens which have not been altered, there are some of these trees which are of a large size: it has a strong woody trunk, which rises to the height of forty feet or more. The bark, while young, is smooth, and of a dark brown colour, but, as the trees advance, the bark becomes cracked, and less smooth. The branches are produced irregularly on every side, standing almost horizontal, and the young slender shoots frequently hang downward, thinly garnished with leaves; so that when the trees are grown large, they make but an indifferent appearance. The young branches are flat, and the small leaves lie imbricatum over each other like the scales of fish; the flowers are produced from the side of the young branches pretty near to the foot-stalk; the male flowers grow in oblong katkins, and between these the female flowers are collected in form of cones. When the former have shed their farina, they soon after drop off, but the female flowers are succeeded by oblong cones, having obtuse smooth scales, containing one or two oblong seeds. The leaves of this tree have a rank oily scent when bruised.

The second sort grows naturally in the northern parts of *China*, where it rises to a considerable height; but this has not been long enough in *Europe* to have any trees of large size. The seeds of this sort were first sent to *Paris* by some of the missionaries, and there are some of the trees growing in the gardens of some curious persons there, which are more than twenty feet high. The branches of this sort grow closer together, and are much better adorned with leaves, which are of a brighter green colour, so make a much better appearance than the other, and, being very hardy, is esteemed preferable to most of the ever-green trees with small leaves, for ornament in gardens. The branches of this tree cross each other at right angles; the leaves are flat, but the single divisions of the leaves are slender, and the scales are smaller, and lie closer over each other than those of the first sort. The cones are also much larger, and of a beautiful gray colour; their scales end in acute reflexed points.

These trees may be propagated by seeds, layers, or cuttings. The first sort is commonly propagated by cuttings; these should be planted in *September*, upon a shady border, and in a loamy soil; the cuttings should be chosen from the shoots of the same year, with a small joint of the former year's wood at the bottom of each. These should be planted three or four inches deep, in proportion to their length, treading the ground close to them to prevent the admission of air. If the following spring should prove dry, there should be a little mulch laid over the surface of the ground to prevent its drying; where this is performed in time, it will save the trouble of watering the cuttings; and it will be much better for them, because when these are putting out their young fibres, if they are much watered, it will rot them while they are tender. These cuttings will be rooted enough to transplant by the next autumn, when they may be either planted in beds, or in nursery-rows to be trained up.

When they are propagated by layers, the young branches only should be laid down in autumn, which will also put out roots by the next autumn, when they may be taken up, and transplanted in the same manner as those raised from cuttings; but although these are very expeditious methods of propagating this tree, yet those who are desirous to have large trees, should always propagate them by seeds, for the plants so raised will be much preferable to the other.

There is a variety of the first sort with variegated leaves, which some people keep in their gardens; but as this proceeds from a weakness in the plants, so whenever the plants

plants become strong and vigorous, they always return to their plain colour again; to prevent which, they generally plant them in very poor ground. This variety can only be preserved by propagating the plants, either by cuttings or layers.

The *China* sort is generally propagated by layers in the same way as the former, but the cuttings of this, if rightly managed, will take root very freely; but most people have over nursed them. If these are planted in *September* in a border of soft loam, exposed to the east, and if before the hard frost sets in, the surface of the ground is covered with old tanners bark about two inches thick, it will prevent the frost from penetrating the ground; and if this remains in the spring, it will also keep the ground moist, for if the cuttings or layers of this sort are watered too much in the spring, when they are beginning to put out young fibres, it will certainly rot them, as I have frequently experienced; therefore I advise every one not to water these cuttings or layers, nor should the plants be much watered when they are transplanted, for the same reason; but as there are many plants now in *England* which ripen their seeds, so those who can be supplied with them, should prefer them to the other; for, after the first two years, the seedling plants will greatly outstrip the other in growth, and the plants will be much handsomer.

These seeds should be sown soon after they are ripe, which is in the spring. They should be sown in pots, filled with soft loamy earth, and plunged into the ground in an east border, where they may have only the morning sun, observing always to keep the pots clean from weeds. Sometimes these seeds will come up the same year, but they often lie in the ground till the next spring; therefore the pots should be put in a common hot-bed frame in winter, and in the spring the plants will come up; these must not be too much exposed to the sun the first year, and if in the next winter they are sheltered under a frame, it will be a good way to preserve them; and the spring following they may be transplanted into beds, and treated in the same way as those propagated by cuttings.

THYMBRA. *Lin. Gen. Plant.* 627.

The Characters are,

It has an empalement of one leaf, whose brim is cut into two lips. The flower is of one petal, of the lip kind. The upper lip is concave, cut into two obtuse segments. The lower lip ends with three almost equal points; it has four slender stamina, the two under being shorter than the other, terminated by twin summits, and a four-pointed germen, supporting a slender half bifid style, crowned by acute stigmas. The germen afterward becomes four seeds, which ripen in the empalement.

The Species are,

1. THYMBRA *floribus spicatis. Lin. Sp. Plant.* 569. Thymbra with spiked flowers; or Mountain Macedonian Hyssop.

2. THYMBRA *floribus verticillatis. Lin. Sp. Plant.* 569. Thymbra with whorled flowers; or rough, narrow-leaved, Mountain Hyssop.

The first sort grows naturally on *Mount Libanus*, in *Macedonia*, and also in *Spain*; it is a low shrubby plant like Heath, branching out into slender ligneous stalks, which are six or eight inches long, covered with a brown bark, garnished with narrow acute-pointed leaves, sitting close to the stalks opposite; they have an aromattick odour when bruised. The stalks are terminated by thick close spikes of purple flowers, near two inches long. The empalements are stiff and hairy, cut half their length into acute segments; out of these the flowers peep with their two lips, the upper is concave and arched, the under is cut into three equal portions, a little reflexed.

The second sort grows naturally in *Spain* and *Italy*; this

has a shrubby stalk, which seldom rises much more than a foot high, putting out many small ligneous branches, garnished with narrow spear-shaped leaves, which have many punctures; they stand opposite, and are of an aromattick flavour. The flowers grow in whorled spikes at the end of the branches. The leaves which stand under each whorl, are broader than those below, and are covered with fine hairs. The flowers are purple, and sit close to the stalks; the upper lip is concave, ending with two obtuse points; the lower ends with three equal points.

These plants are propagated by seeds, which should be sown in the spring on a bed of light earth, where, if the seeds are good, the plants will appear in about six or eight weeks. When they come up, they must be kept clean from weeds, and in *July* they will be fit to remove; at which time part of them should be planted in small pots, and the other may be planted in a warm border of dry ground, being careful to shade them from the sun, and supply them with water until they have taken new root; after which those in the full ground will require no other care but to keep them clean from weeds, and, if the winter should prove very severe, they should be covered with mats, or some other light covering, to protect them; for the young plants are in greater danger of being destroyed than those which are older. Those plants in the pots should be sheltered under a common frame in winter, where they may enjoy the free air in mild weather, and be protected from hard frost.

These plants will live in the open air in *England* unless the winters prove very severe, especially if they are planted in a poor, dry, stony soil.

THYMELÆA. See *Daphne* and *Passerina*.

THYMUS. *Tourn. Inst. R. H.* 196. *tab.* 93. Thyme.

The Characters are,

The flower has a permanent empalement, divided into two lips, whose chaps are hairy and stout. The upper lip is broad, plain, erect, and indented in three parts; the under lip ends in two equal bristles. The flower is of the lip kind; it has one petal, with a tube the length of the empalement. The chaps are small, the upper lip is short, erect, obtuse, and indented at the point; the lower lip is long, broad, and divided into three parts. It has four incurved stamina, two being longer than the other, terminated by small summits, and a four-pointed germen, supporting a slender style, crowned by a bifid acute stigma. The germen afterward turns to four small roundish seeds, ripening in the empalement.

The Species are,

1. THYMUS *erectus, foliis revolutis ovatis, floribus verticillato-spicatis. Hort. Cliff.* 305. Upright Thyme with oval leaves, which turn backward, and flowers growing in whorled spikes; or common broad-leaved Thyme.

2. THYMUS *foliis lineari-lanceolatis incanis, floribus verticillato-spicatis.* Thyme with linear, spear-shaped, hoary leaves, and flowers growing in whorled spikes; or common Thyme with narrow leaves.

3. THYMUS *capitulis imbricatis magnis, bracteis ovatis, foliis lanceolatis. Lin. Sp. Plant.* 592. Thyme with large imbricated heads, oval bractæ, and spear-shaped leaves.

4. THYMUS *capitulis imbricatis magnis, bracteis dentatis, foliis setaceis pilosis. Lin. Sp. Plant.* 592. Thyme with large imbricated heads, indented bractæ, and bristly hairy leaves.

5. THYMUS *floribus capitatis, caulibus repentibus, foliis ovatis pilosis.* Thyme with flowers growing in heads, creeping stalks, and oval hairy leaves; or broad-leaved, hairy, Mother of Thyme.

6. THYMUS *floribus capitatis, caulibus repentibus, foliis lanceolatis glabris.* Thyme with flowers growing in heads, creeping stalks, and smooth spear-shaped leaves; or common greater Mother of Thyme, with a purple flower.

7. *THYMUS caulibus repentibus, foliis ovatis glabris, floribus verticillato-spicatis.* Thyme with strong creeping stalks, oval smooth leaves, and flowers growing in whorled spikes; or common greater Mother of Thyme, with a smaller flower.

8. *THYMUS caulibus repentibus, foliis ovato lanceolatis rigidis lanuginosis, floribus capitatis.* Thyme with creeping stalks, oval, spear-shaped, stiff leaves, which are downy, and flowers growing in heads; or hairy Rock Mother of Thyme.

9. *THYMUS caulibus decumbentibus, foliis lineari-lanceolatis glabris, floribus alaribus terminalibusque.* Thyme with trailing stalks, linear, spear-shaped, smooth leaves, and flowers growing at the wings and tops of the stalks.

The first sort is the common Thyme, which is cultivated in the gardens for the kitchen, and also for medicine. This grows naturally on stony rocky places in the south of France, in Spain and Italy, and is so well known here as to need no description.

It is propagated either by seeds, or parting the roots; the season for the latter is in March or October. If it is propagated by seeds, they should be sown upon a bed of light earth in the spring, observing not to bury the seeds too deep, nor to sow them too thick, for the seeds are very small. When the plants are come up, they should be carefully cleared from weeds; and if the spring should prove dry, if they are watered twice a week, it will greatly promote their growth. In June the plants should be thinned, leaving them about six inches asunder each way, that they may have room to spread; and those plants which are drawn out, may be transplanted into fresh beds at the same distance, observing to water them until they have taken root; after which they will require no farther care, but to keep them clear from weeds; and when the plants are big enough, they may be drawn up for use.

But if the plants are propagated by parting their roots, the old plants should be taken up at the times before-mentioned, and split into as many parts as can be taken off the roots; these should be transplanted into beds of fresh light earth at six or eight inches distance, observing, if the season is dry, to water them until they have taken root; after which they must be duly weeded, which will cause them to thrive, and soon be fit for use.

In order to save the seeds of these plants, some of the old roots should remain unremoved in the place where they were sown the preceding year; these will flower in June, and in August the seed will ripen, which must be taken as soon as it is ripe, and beat out, otherwise the first rain will wash it all out of the husks.

These plants root greatly in the ground, and thereby draw out the goodness of the soil sooner than most other plants; so that whatever is sown or planted upon a spot of ground, whereon Thyme grew the preceding year, will seldom thrive, unless the ground be trenched deeper than the Thyme rooted, and well dunged.

If this plant grows upon walls, or on dry, poor, stony land, it will endure the greatest cold of this country; but in rich ground, where the plants grow vigorously, they are sometimes destroyed by very severe frost.

There is a variety of this with variegated leaves, which is by some preserved in their gardens.

The second sort has shorter stalks; the leaves are longer, narrower, and end in sharper points than the first, and the whole plant is hoary. The flowers grow in long whorled spikes, and are larger than those of the common Thyme. This may be propagated and treated in the same way as the first sort.

The third sort grows naturally in Spain and Portugal; this has a low woody stalk, from which come out many

stiff branches about five or six inches long, garnished with small, narrow, spear-shaped leaves, placed opposite, terminated by pretty large heads of flowers, which come out from oval scaly leaves lying over each other like the scales of fish; they are white and small, so make no great appearance. The whole plant is of a hoary colour, and has an aromattick weak scent.

The fourth sort grows naturally in Portugal; this has slender, ligneous, hairy stalks, which grow erect about six inches high, garnished with very narrow, bristly, hairy leaves, which, at the lower part of the stalk, come out in clusters, but upward they are placed by pairs. The stalks are terminated by large scaly heads. The leafy scales are indented in acute points; these lie over each other in the same order as the other, and between them the flowers peep out, which are of a purple colour, shaped like those of the common Thyme.

These two sorts may be propagated by slips, if they are planted in April on an east border, and closely covered with a bell or hand-glass, they will soon put out roots, when some of them may be transplanted into pots, to be sheltered under a frame in winter; but the others should be planted on a warm border of dry ground, observing to shade and water them till they have taken new root. These plants will live through the winter in the open air in a warm dry situation, but in severe frost they are generally destroyed; therefore to preserve the kinds, a few plants of each should be sheltered under a frame in winter; they may be propagated by seeds, when they can be procured. If these are sown on a bed of light earth, in the same way as common Marjoram, the plants will come up, and may be treated as those raised from slips.

The fifth sort is the common Mother of Thyme, which is frequently titled wild Thyme; it grows naturally upon dry commons and pastures in most parts of England, so is very rarely admitted into gardens. This is so well known as to need no description. There is a very common mistake which has prevailed in regard to this plant, which is, that the sheep and deer which feed upon it, have much finer flavoured flesh than others, whereas no cattle will meddle with it; for in the places where it grows, when the Grass is as closely eaten down as possible, the wild Thyme will be found in flower with all its stalks entire.

Of this there are the following varieties. The small creeping Mother of Thyme without scent. Narrow-leaved Mother of Thyme, smelling like the leaves of the Walnut-tree. Shrubby Mother of Thyme with pale red flowers, and the Lemon Thyme. The last is frequently kept in gardens for the agreeable odour of its leaves. But when this is propagated by seeds, the plants have not the same scent; so it is an accidental variety, which is maintained by propagating it by slips and cuttings.

The sixth sort has broader and smoother leaves than the common sort; the stalks grow much longer; the joints are farther distant; the heads of flowers are larger, and the flowers are of a brighter purple colour. There is a variety of this with variegated leaves, which is propagated in gardens, and was formerly planted for edgings to borders; but it is now frequently brought in pots to the markets to supply the London gardens.

The seventh sort has creeping stalks like the common kind, but they grow longer, and their joints are farther asunder; the leaves are oval, smooth, and of a lucid green. The flowers grow in close thick whorls, which are distant from each other, forming a loose spike five or six inches long. The flowers of this sort are much smaller than those of the common sort, appearing but little beyond their empalements. This is pretty common in the neighbourhood of Paris, but is rarely found growing naturally in England.

The eighth sort grows naturally in the forest of *Fontainebleau* in *France*; this has creeping slender stalks like the first, which are garnished with small, oval, spear-shaped, hoary leaves; the young shoots of the same year are also very white and hoary. The leaves are stiffer than those of the other sorts. The flowers are produced in round heads at the end of the branches; they are of a bright purple colour, and appear at the same time as those of the other sorts.

The ninth sort grows naturally in *Tartary*; this is a biennial plant. The stalks are long, slender, and trail upon the ground, but do not emit roots from their joints as most of the others do. The stalks are smooth, of a light brown colour, garnished with narrow spear-shaped leaves, which are smooth. The small whorls of flowers come out at the wings of the leaves, and the stalks are terminated by oblong heads of flowers, whose empalements are hoary. The flowers are of a bright purple colour. The whole plant has an agreeable aromack scent.

All these sorts may be easily propagated by those who are desirous to have them in their gardens, either by slips, or parting of their roots in the same manner as *Thyme*, or their seeds may be sown in the spring. They delight in dry undunged ground, where they will propagate themselves by their trailing stalks, and require no other care but to keep them clean from weeds.

THYME THE MARUM. See *Teucrium*.

THYME THE MASTICH. See *Satureja*.

TIARELLA. *Lin. Gen. Plant.* 495 Sanicle.

The Characters are,

The flower has a permanent empalement, divided into five oval acute parts; it has five oval petals the length of the empalement; and ten awl-shaped stamina, which are much longer than the petals, terminated by roundish summits, and a bifid germen ending with two styles, crowned by single stigmas. The germen afterward becomes an oblong capsule with one cell, opening with two valves, containing several small oval seeds.

The Species are,

1. TIARELLA foliis cordatis. *Lin. Gen. Nov.* 188. *Sp. Plant.* 405. Tiarella with heart-shaped leaves.

2. TIARELLA foliis ternatis. *Lin. Gen. Nov.* 188. *Sp. Plant.* 405. Tiarella with trifoliate leaves.

The first sort grows naturally in *North America*; this has a perennial fibrous root, which creeps and multiplies, from which come out many heart-shaped leaves upon slender foot-stalks. The leaves are unequally indented on their edges, and are of a light green colour. The flowers stand upon slender naked foot-stalks, which arise immediately from the root between the leaves, which is about four inches long, and is terminated by a loose spike of small herbaceous white flowers, but are seldom succeeded by seeds in *England*.

This plant is propagated by its creeping roots which spread in the ground, and shoot up heads, these may be taken off and transplanted in the autumn. It loves a moist soil and shady situation, and requires no other care but to keep it clean from weeds.

The second sort grows naturally in the northern parts of *Afia*; this has a perennial fibrous root, from which spring up a few trifoliate leaves upon foot-stalks, like those of the *Bilberry*, but much smaller. The stalk is slender, and rises five or six inches high; it is rough and hairy, garnished with two leaves at the bottom, and another toward the top, a little below the spike of flowers; they are angular and sawed on their edges. The stalk is terminated by a loose spike of flowers, which are composed of five white small petals, inserted in the empalement, and ten awl-shaped stamina which are longer than the petals, terminated by roundish summits.

This sort is propagated by parting of the root, in the

same manner as the former, and delights in a moist soil and a shady situation.

TILIA. *Tourn. Inst. R. H.* 611. *tab.* 381. The Lime, or Linden-tree.

The Characters are,

The flower has a concave coloured empalement, which is cut into five parts; it has five oblong blunt petals, which are crenated at their points, and many awl-shaped stamina, terminated by single summits, with a roundish germen, supporting a slender style the length of the stamina, crowned by an obtuse five-cornered stigma. The germen afterward becomes a thick globular capsule with five cells, opening at the base with five valves, each containing one roundish seed.

The Species are,

1. TILIA foliis cordatis acuminatis, inæqualiter serratis, fructibus quinque locularibus tomentosis. Lime-tree with heart-shaped acute-pointed leaves, which are unequally sawed, and a woolly fruit having five cells; Lime-tree with a smaller leaf.

2. TILIA foliis acuminatis, serratis, subhirsutis, fructibus quadri-locularibus subpilosis. Lime-tree with acute-pointed leaves, which are sawed, somewhat hairy, and a hairy fruit having four cells; the red-twined Lime-tree.

3. TILIA foliis cordatis acuminatis serratis, subtus pilosis floribus nectario instructis. Lime-tree with heart-shaped, acute-pointed, sawed leaves, which are hairy on their under side; and flowers furnished with nectarii. This is called the *American black Lime*.

4. TILIA foliis cordatis obliquis glabris subserratis cum acumine, floribus nectario instructis. Lime-tree with heart-shaped smooth leaves, which are oblique to the foot-stalk, somewhat sawed on their edges, ending in acute points, and flowers having nectarii; or *Carolina Lime-tree*.

The first sort grows naturally in the woods in many parts of *England*; of this there are two or three varieties, which differ in size and smoothness of their leaves, some of them having much larger and rougher leaves than the others: I raised plants of three of these varieties from seeds, but have constantly found them vary from one to the other; and I much doubt if the second is more than a seminal variety, but as I have not had an opportunity of raising any of the plants from seeds, I cannot positively determine this.

The large-leaved *Dutch Lime* was generally preferred to our common sort for the size of its leaves; but of late years all these trees are little esteemed, because it is late in spring before their leaves come out, and they begin to decay the first in autumn; and when the trees are planted in a dry soil, their leaves frequently decay in *July*, so are continually falling off, making a litter all the remaining part of summer.

The third sort was brought from *New England*, by the title of *Black Lime*. The branches of this sort are covered with a dark brown bark. The leaves are large, heart-shaped, and end in acute points; they are deeply sawed on their edges, of a deep green on their upper side, but of a pale green and a little hairy on their under side, standing upon long slender foot-stalks. The flowers are produced in bunches, in the same manner as those of the common Lime-tree; but the petals of the flowers are narrower, and have nectarii growing to their base. The flowers of this sort do not appear till late in *July*, so are a full month after the common sort. The capsules are smaller, rounder, and less hairy than those of the common sort.

The seeds of the fourth sort were brought from *Carolina* by the late Mr. *Catesby*. This tree seems to be of much smaller growth than either of the other sorts; the branches spread more horizontally. The leaves are smaller, and have a smoother surface than either of the other; they are heart-shaped, but the midrib runs oblique to the foot-stalk,

so that one side is much larger than the other. Their edges are slightly sawed, and their tops run out into long acute points. The bunches of flowers stand upon long slender foot-stalks; the petals of the flowers are narrow, and end in acute points; these have a narrow nectarium fastened to their base on the inside, which stands erect, close to the petals. The flowers emit a very fragrant odour, and are continually haunted by bees during their continuance.

All these trees are easily propagated by layers, which in one year will take good root, and may then be taken off, and planted in a nursery, at four feet distance row from row, and two feet asunder in the rows. The best time to lay them down, and to remove them, is when their leaves begin to fall, that they may take root before the frost comes on, though they may be transplanted any time from September to March, in open weather; but if the soil is dry, it is much the better way to remove them in autumn, because it will save a great expence in watering, especially if the spring should prove dry. In this nursery they may remain four or five years, during which time the ground should be dug every spring, and constantly kept clear from weeds, and the large side shoots pruned off, to cause them to advance in height; but the small twigs must not be pruned off from the stems, because these are absolutely necessary to detain the sap, for the augmentation of their trunks, which are apt to shoot up too slender, when they are entirely divested of all their lateral twigs. If the soil, in which they are planted, be a fat loam, they will make a prodigious progress in their growth, so that in three years time they will be fit to transplant out where they are to remain.

They may also be propagated by cuttings; but, as this method is not so certain as by layers, the other is generally practised. In order to obtain proper shoots for laying down, a Lime-tree is cut down close to the ground, from the roots of which a great number of strong shoots are produced the following year; these will be large enough to lay down the following autumn, especially if the smallest of them are cut off close early in the summer; for when too many shoots are suffered to grow all the summer, they will be much weaker, than if only a sufficient quantity is left. The manner of laying down these shoots having been already directed under the article of LAYERS, I need not repeat it here.

There are some persons who raise these trees from seeds, which, although it is a slower way, yet when the trees are designed to grow large, is the best method; and if they are only once transplanted, and this performed while they are young, it will be still the better way; for all trees that are transplanted, are shorter lived than those which remain in the places where they arose from the seeds, and their timber will be sounder, and grow to a much larger size.

When this method is practised, the seeds should be sown in autumn, soon after they are ripe, upon a shady border of moist light soil, where the plants will come up the following spring; but, when the seeds are kept out of the ground till spring, the plants will not come up till the year after. When the plants appear, they should be constantly kept clean from weeds till the following autumn; then they should be carefully taken up, and transplanted into a nursery, where they may grow two or three years to get strength, and then may be planted where they are designed to remain; for the younger they are planted out, the more they will thrive.

The timber of the Lime-tree is used by the carvers, it being a soft light wood, as also by architects for framing the models of their buildings; the turners likewise use it for making light bowls, dishes, &c. but it is too soft for any strong purposes.

These trees will continue growing, and remain sound a

great number of years, and, if planted in a good loamy soil, will grow to a considerable bulk. I have measured one of these trees, which was near ten yards in girth two feet above the ground, and was then in a thriving condition; and Sir Thomas Brown mentions one of these trees which grew in Norfolk, that was sixteen yards in circuit, a foot and a half above ground, in height thirty yards, and in the least part of the trunk it was eight yards and a half.

TINUS. See Viburnum.

TITHYMALUS. Tithymaloides. Tourn. Inst. App. 654. Spurge.

The Characters are,

The flower has an empalement of one leaf, indented in three parts; it has one petal which is shaped like a slipper, of a thick fleshy consistence. Under the upper part of the flower are situated the ten stamina, which are inserted in the receptacle of the flower; they are slender, and terminated by globular summits; in the center is situated a roundish three-cornered germen, supporting three bifid styles, crowned by oblong stigmas. The germen afterward becomes a roundish capsule having three cells, each containing one oval seed.

The Species are,

1. TITHYMALUS foliis ovatis acuminatis. Spurge with oval acute-pointed leaves.
2. TITHYMALUS foliis oblongo ovatis obtusis succulentibus. Spurge with oblong, oval, obtuse leaves, which are very succulent.

The first sort grows naturally near Carthage in America, from whence Mr. Robert Millar, surgeon, sent the branches, which were planted here, and succeeded; this rises with shrubby succulent stalks, to the height of twelve or fourteen feet, which are too weak to stand without support, though they are frequently as large as a man's little finger; but their leaves being succulent, are so heavy as to weigh down the branches, if they are not supported. The leaves are oval, and terminate in acute points; and are ranged alternately on two sides of the branches, to which they fit close. The flowers are produced at the end of the branches three or four together; they are of a scarlet colour, of one petal, in shape of a slipper; these are succeeded by roundish capsules with three furrows, dividing them into three cells, each containing one oblong seed. The whole plant abounds with an acrid milky juice.

The second sort grows naturally in Barbadoes, and most of the other islands in the West Indies, where the English inhabitants know it by the title of Poison Bush; this hath thick, shrubby, succulent stalks, which will grow to the height of ten or twelve feet, larger than those of the first sort, and are garnished with oblong oval leaves ending in blunt points, of a very thick consistence, and of a dark green colour, ranged alternately on two sides of the stalk. The flowers grow at the end of the branches; they are shaped like those of the first sort, and are of a deep red colour; these are succeeded by roundish capsules divided into three cells, each containing one oblong seed.

This whole plant abounds with an acrid milky juice, which will draw blisters on the flesh wherever it is applied, and if it mixes with the blood, I have been credibly informed it becomes a deadly poison; for that if the points of arrows or the edges of swords are rubbed over with this juice, it becomes deadly to any animal wounded with those weapons.

These plants are both propagated by cuttings, which may be taken from the plants during any of the summer months; and after having laid in a dry place for a fortnight or three weeks, until the wounded part be healed over, they should be planted into small pots, filled with light sandy earth mixed with lime-rubbish, and then plunged into a hot-bed of tanners bark, observing now and then to refresh

fresh them gently with moisture, but they should never receive much wet, which will rot them.

After they have taken root, they may have a greater share of air by raising the glasses, but they must never be wholly exposed to the open air. In this bed they may remain until the beginning of *October*, when they must be removed, and placed with the Melon and Torch Thistle in a warm dry stove, and during the winter season they should have very little water, which, if given in plenty, seldom fails to rot them.

These plants are too tender to thrive in the open air in *England*, therefore should constantly remain in the stove, observing in the summer season, when the air is warm, to admit a large share of fresh air to them, and in the winter to place them in a warm part of the stove, otherwise they cannot be preserved.

They must be shifted every summer, and fresh earth given to them. If the earth is light or sandy it will require no mixture, for rich or strong ground is very improper for them; therefore where the soil is inclinable to either of these, there should be a good mixture of sand and lime-rubbish to prevent its binding, or detaining moisture.

These plants are preserved for their odd appearance amongst other succulent plants, their leaves being very large, thick, and full of a milky acrid juice.

TITHYMALUS. See Euphorbia.

TOAD FLAX. See Linaria.

TOBACCO. See Nicotiana.

TOLUIFERA. *Lin. Gen. Plant.* 470. Balsam of Tolu Tree.

The Characters are,

The flower has a bell-shaped empalement of one leaf, which is slightly indented in five parts at the brim; it has five petals inserted in the receptacle of the flower, four of which are narrow and equal, being a little longer than the empalement, and the fifth is much larger, and almost heart-shaped, having a tail the length of the empalement; it has ten short stamina terminated by oblong erect summits, and a roundish germen, supporting a very short style, crowned by an acute stigma. The germen afterward turns to a roundish fruit with four cells, each containing one oval seed.

We know but one Species of this genus, viz.

TOLUIFERA. *Lin. Mat. Med.* The Balsam-tree of Tolu.

This tree grows naturally near *Carthagena* in *America*, from whence the late *Dr. Housloun* sent the seeds to *England*: in its native place this grows to a tree of a large size. The bark is very thick, rough, and of a brown colour; the branches spread out wide on every side, and are garnished with winged leaves, composed of several oblong oval lobes, placed alternately along the foot-stalk, terminated by an odd one, rounded at both ends, but run out to an acute point at the top; they are smooth, of a light green colour, and sit close to the foot-stalk. The flowers are produced in small bunches at the wings of the branches, each standing upon a slender foot-stalk almost an inch long; their empalements are of the round bell-shape, being of one leaf, which is slightly scolloped at the brim into five obtuse parts. The flower has four narrow petals of a yellow colour, which are a little longer than the empalement, and one more whose tail is of the same length of the other petals; the top is of an oval heart-shape, stretched out beyond the other parts; it has ten short stamina within the tube of the flower, which are terminated by oblong erect summits of a Sulphur colour, and at the bottom of the tube is situated a roundish germen, having a very short style crowned by an acute-pointed stigma. After the flower is past, the germen turns to a roundish fruit the size of a large Pea, divided into four cells, each containing one oblong oval seed.

This tree may be propagated by seeds, which must be procured from the country where it grows naturally, and should be fresh, otherwise they will not grow. When they are gathered from the tree, they should be put up in sand to preserve them; for when they are sent over in papers, the insects generally devour them. These seeds must be sown in pots filled with light earth as soon as they arrive, and plunged into the tan. If it should happen in autumn or winter they must be plunged into the stove, but in spring or summer they may be plunged in the tan-bed under a frame; they should be taken out of their covers, otherwise they will be long in the ground before they vegetate. When the plants come up, and are fit to remove, they should be carefully transplanted, each into a separate pot, and plunged into a good hot-bed of tanners bark, shading them from the sun till they have taken new root; after which they should be treated in the same way as the Coffee-tree, with which management the plants will succeed.

TORDYLIUM. *Tourn. Inst. R. H.* 320. *tab.* 170. *Lin. Gen. Plant.* 293. Hartwort.

The Characters are,

It hath an umbellated flower; the principal umbel is composed of many small ones, compounded of many rays; the involucre of the greater umbel is composed of narrow leaves, as long as the rays of the umbel; those of the rays are half the length; the umbels are difformed; the flowers have five heart-shaped inflexed petals, which are equal; they have each five hair-like stamina terminated by single summits, and a roundish germen, situated under the flower, supporting two small styles crowned by obtuse stigmas. The germen afterward turn to a roundish compressed fruit longitudinally indented, dividing in two parts, each containing one roundish compressed seed with an indented border.

The Species are,

1. TORDYLIUM *umbellâ confertâ radiatâ, foliis lanceolatis inciso-serratis.* *Hort. Cliff.* 90. Hartwort with the rays of the umbel closed together, the lobes of the leaves spear-shaped, and cut like saws.

2. TORDYLIUM *involucris partialibus longitudine petalorum, foliis ovatis laciniatis.* *Hort. Cliff.* 90. Hartwort with the involucrii of the rays as long as the petals of the flower, and oval-jagged leaves.

3. TORDYLIUM *involucris umbellâ longicribus.* *Hort. Cliff.* 90. Hartwort with longer involucrii to the umbels.

4. TORDYLIUM *umbellâ confertâ radiatâ, foliis linearilanceolatis pinnato-dentatis.* Hartwort with the rays of the umbel closed together, and linear spear-shaped leaves, which are wing-indented on their edges.

5. TORDYLIUM *umbellulis remotis, foliis pinnatis, pinnis subrotundis laciniatis.* *Hort. Cliff.* 90. Hartwort with the umbels growing at a distance, winged leaves having roundish lobes, which are cut on their edges.

6. TORDYLIUM *umbellulis remotis, foliis duplicato-pinnatis, pinnis incisiss tomentosiss.* Hartwort whose umbels are distant from each other, and doubly-winged leaves whose lobes are cut and downy; by the *Arabians* called *Secacul*.

7. TORDYLIUM *umbellis simplicibus sessilibus seminibus exterioribus hispiddis.* *Lin. Gen. Plant.* 240. Hartwort with single umbels sitting close to the stalks, and the outer side of the seeds prickly; or *Knotted Parsley*.

8. TORDYLIUM *umbellâ confertâ, foliis ovato-lanceolatis pinnatifiddis.* *Hort. Cliff.* 90. Hartwort with closed umbels, and oval, spear-shaped, wing-pointed lobes; called *Hedge Parsley*.

The first sort grows in *Italy* and *Spain*; this is a biennial plant, which dies soon after it has perfected its seeds. The lower leaves of this sort are large and winged, each having three or four pair of lobes terminated by an odd one. They are rough and hairy, having many deep indentures on their edges like the teeth of a saw; the stalk

rises three feet high, sending out two or three branches from the side, garnished at each joint by one winged leaf; those on the lower part of the stalk have two pair of small lobes terminated by an odd one, but those toward the top have one pair, and the middle lobe is long and narrow. The stalk and branches are terminated by umbels of white flowers, whose rays are closed together; these are succeeded by oval compressed seeds, having a thick white border.

The second sort grows plentifully about *Rome*, and also in the south of *France*; this is mentioned in the last edition of *Ray's Synopsis* as an *English* plant, growing naturally in *Oxfordshire*, where I have found it growing on the side of banks, but the seeds were sown there by Mr. *Jacob Bobart*, gardener at *Oxford*. The leaves of this sort are composed of three or four pair of oval lobes, terminated by an odd one; they are soft and hairy, bluntly indented on their edges. The stalks rise a foot and a half high, and divide into three or four branches, having one small leaf at each joint, and are terminated by umbels of white flowers, composed of several small umbels or rays, which stand upon long foot-stalks, spreading out wide from each other. The flowers are succeeded by smaller compressed seeds, which are bordered.

The third sort grows naturally in *Syria*; this is a low plant, whose stalks seldom rise a foot high. The lower leaves are composed of two pair of oval lobes, terminated by one large one; these are hairy, and slightly crenated on their edges; they branch out into two or three divisions, and are terminated by umbels of white flowers, which have large involucrems, for the most part trifid. The points are spear-shaped, and at their base is situated a small umbel, composed of a few flowers sitting very close to the tails of the involucrii. The flowers are succeeded by large, oval, compressed, bordered seeds.

The fourth sort grows naturally in *Sicily*. The stalks of this sort are deeply channelled, hairy, and rough; they rise near three feet high; the leaves are composed of two or three pair of narrow lobes terminated by one long one, which are hairy, and regularly indented on their borders in form of winged leaves; those on the upper part of the stalk have but one pair of small lobes, with a very long narrow middle lobe, which is deeply and regularly indented. The umbels, which terminate the stalks, are small; the rays are closely connected together; the flowers are large and white, and are succeeded by oval, compressed, bordered seeds, which have white edges deeply crenated.

The fifth sort grows naturally in *Italy*. The stalks of this sort branch out from the bottom, and seldom rise a foot high; they are hairy and rough. The lower leaves are composed of three pair of roundish lobes, terminated by an odd one, which are hairy and jagged. The general umbel is composed of eight small ones, which stand upon very long foot-stalks, and spread out wide from each other. The flowers are white, and the exterior petal of each is much larger than those of the two first sorts; these are succeeded by roundish, compressed, bordered seeds.

The sixth sort grows naturally about *Aleppo*, and in other parts of *Syria*. The bottom leaves are doubly-winged, each leaf being composed of four pair of wings terminated by an odd one. The wings are composed of seven oval lobes, standing alternately, which are deeply jagged; they are of a yellowish green colour, and a little hairy. The stalks are taper, and not channelled; they rise two feet and a half high, have a few small hairs scattered over them, and at each joint are garnished with one smaller winged leaf; they send out one or two short branches toward the top, terminated by large umbels of yellow flowers, composed of ten small umbels, whose foot-stalks are alternately longer, spreading open wide from each other. The flowers are succeeded by

compressed oval seeds, shaped like those of Parsneps, of a yellowish colour.

The seventh sort grows naturally in arable land, in several of the maritime counties in *England*, so is rarely admitted into gardens; this has trailing stalks which spread flat on the ground. The leaves are like those of Parsley, but are cut into finer segments; the umbels of flowers are small, and sit close to the joints of the stalks; the flowers are small, white, and are succeeded by short seeds a little compressed, set with sharp burry prickles on their outside.

The eighth sort grows naturally on the side of banks and foot-paths in many parts of *England*; this rises with a slender stalk three feet high. The leaves are like those of Parsley; their lobes are spear shaped and have winged points; they are hairy, and stand thinly on the stalks. The flowers are produced in small umbels at the top of the stalks, which are composed of several smaller umbels or rays, which close together, of a pale red colour; these are succeeded by small prickly seeds.

All these plants may be termed annual, because they do not live more than one year; but some of them are called biennial, from the young plants which come up in autumn, living through the winter, and producing their flowers and fruits the following summer; but, as the seeds which are sown, or permitted to scatter, perfect their seeds in the compass of one year, they should be termed annual, for this is the property of many of the plants with umbellated flowers, whose seeds should be sown in autumn, otherwise, if they come up (which frequently does not happen the same year when they are sown in the spring), the plants generally decay before their seeds ripen; but, as their whole growth is performed within the year, they should be esteemed as annual plants.

They are propagated by seeds, which should be sown in autumn soon after they are ripe, when the plants will soon appear, and are very hardy, so that they require no farther care, but to keep them clear from weeds, and where they come up too close together, they should be thinned so as to leave them six inches asunder. In *June* following the plants will flower, and their seeds will ripen in autumn, which, if permitted to scatter on the ground, will produce a supply of plants without any trouble. These plants will grow on any soil or situation, so may be put into any obscure part of the garden.

TORMENTILLA. *Tourn. Inst. R. H. 298. tab. 153.*
Tormentil.

The Characters are,

The flower has a plain empalement of one leaf, divided into eight segments at the top; it has four oval heart-shaped petals, whose tails are inserted in the empalement, and many awl-shaped stamina, which are inserted in the empalement, terminated by single summits; it has eight small germen collected in a head, which have slender styles the length of the germen, inserted to their sides, crowned by obtuse stigmas. The germen afterward turns to a fruit, containing many small seeds included in the empalement.

The Species are,

1. TORMENTILLA caule erecto. *Lin. Sp. Plant. 500.* Tormentil with an erect stalk; common Tormentil.

2. TORMENTILLA caule repente. *Lin. Sp. Plant. 500.* Tormentil with a creeping stalk; or creeping winged Cinquefoil.

The first sort grows wild on dry pastures and commons, in most parts of *England*, so is never cultivated in gardens; this is so commonly known as to need no description. The roots of this plant have been frequently used for tanning of leather, in places where Oak bark is scarce. This root is also much used in medicine, and is accounted the best astringent in the whole vegetable kingdom.

The second fort is found in some particular places of England growing wild, but particularly in *Oxfordshire*. The stalk of this fort spreads on the ground, and emit-roots from their joints, whereby they propagate very fast: this is rarely preserved, unless in some botanick gardens for the sake of variety. It requires no care to propagate these plants, since, if their roots are once planted in almost any soil or situation, the plants will flourish without any other care, but to prevent their being over-run with great weeds.

TOURNEFORTIA. *Lin. Gen. Plant.* 176.

The Characters are,

The empalement of the flower is permanent, of one leaf, cut into five small segments at the top. The flower is of one petal, of the globular bell-shape, cut at the brim into five acute points, which spread open horizontally; it has five awl-shaped stamina the length of the tube, terminated by single summits, and a globular germen, supporting a single style the length of the stamina, crowned by a single stigma. The germen afterward becomes a spherical succulent berry, inclosing four oblong oval seeds, resting upon the empalement.

The Species are,

1. TOURNEFORTIA *foliis ovato lanceolatis, spicis longissimis racemosis erectis, caule fruticoso*. Tournefortia with oval spear-shaped leaves, long branching erect spikes of flowers, and a shrubby stalk.

2. TOURNEFORTIA *foliis ovatis petiolatis, caule hirsuto, spicis ramosissimis-terminalibus*. *Lin. Sp. Plant.* 140. Tournefortia with oval leaves growing upon foot-stalks, and a hairy stalk, terminated by very branching spikes of flowers.

3. TOURNEFORTIA *foliis ovatis acuminatis, petiolis reflexis, caule volubili*. *Lin. Sp. Plant.* 143. Tournefortia with oval acute-pointed leaves, having reflexed foot-stalks, and a twining stalk.

4. TOURNEFORTIA *foliis cordatis hirsutis, spicis racemosis reflexis, caule volubili*. Tournefortia with hairy heart-shaped leaves, branching reflexed spikes of flowers, and a twining stalk.

5. TOURNEFORTIA *foliis cordatis subtus tomentosis, spicis racemosis brevibus, caule volubili*. Tournefortia with heart-shaped leaves, which are woolly on their under side, very short branching spikes of flowers, and a twining stalk.

6. TOURNEFORTIA *foliis ovatis rugosis petiolatis, spicis racemosis axillaribus, caule fruticoso*. Tournefortia with oval rough leaves growing upon foot-stalks, branching spikes of flowers proceeding from the wings of the stalks, and a shrubby stalk.

7. TOURNEFORTIA *foliis ovato-lanceolatis acutis, subtus tomentosis, spicis ramosis incurvis caule ramoso*. Tournefortia with oval spear-shaped leaves, having acute points, woolly on their under side, branching incurved spikes of flowers, and a branching stalk.

8. TOURNEFORTIA *foliis lanceolatis sessilibus, spicis simplicibus recurvis lateralibus*. *Lin. Sp. Plant.* 141. Tournefortia with spear-shaped leaves sitting close to the stalk, and single recurved spikes of flowers growing at the wings.

The first fort grows naturally in *Jamaica*, and in some of the other islands in the *West-Indies*, where it rises with shrubby stalks ten or twelve feet high, sending out many branches, garnished with oval spear-shaped leaves, placed alternately round the stalks, hairy on their under side, and stand upon short foot-stalks. The branches are terminated by long branching spikes of flowers, which are ranged on one side the foot stalks in the same manner as those of the *Heliotrope* or *Turnsol*. Some of the foot stalks sustain two, others three, and some four spikes of flowers, reflexed like a scorpion's tail at the top. The flowers are of a dirty white colour, small, and closely ranged on one side the spike; these are succeeded by small succulent fruit, inclosing four oblong seeds in each.

The second fort is also a native of the islands in the *West-Indies*. The stalks of this are shrubby, taper, and rough; they rise to the height of eight or ten feet, dividing into many branches, covered with a light, brown, hairy, rough bark, garnished with oval leaves, placed alternately, having many transverse veins running from the midrib to the sides; they are of a deep green on their upper side. The branches are terminated by branching spikes of flowers, succeeded by small, roundish, succulent fruit, each inclosing four oblong seeds.

The third fort grows naturally in *Jamaica*, and some of the islands in *America*; this hath a twining ligneous stalk, which twists about the neighbouring trees for support, and rises to the height of ten or twelve feet, sending out several slender ligneous branches, garnished with oval acute-pointed leaves, whose foot-stalks are reflexed. The flowers are produced in branching spikes from the side and the top of the branches; they are small, white, and are succeeded by small, white, succulent berries, having one or two black spots on each.

The fourth fort was discovered by the late Dr. *Houstoun*, growing naturally in *Jamaica*; this hath shrubby branching stalks, which twine about the neighbouring trees, and rise to the height of ten or twelve feet. The branches are garnished with heart-shaped hairy leaves, ending in acute points, of a thinner contexture than those of the former species, and stand upon short foot-stalks. The flowers come out at the end of the branches in very slender spikes; they are small, and of a dirty brown colour, ranged along the upper side of the foot-stalk; these are succeeded by small pulpy berries, each containing four seeds.

The fifth fort grows naturally near *Cartagena*, in *New Spain*; this has climbing stalks, which twine about any neighbouring support, and rise to the height of ten or twelve feet. The branches are garnished with heart-shaped leaves, downy on their under side, and stand upon very short foot-stalks. The flowers are produced in short branching spikes, which come out from the wings of the branches; they are of a dirty white colour, small, and are succeeded by small succulent berries, inclosing two, three, and sometimes four seeds.

The sixth fort grows naturally near *Cartagena*, in *New Spain*; this has strong ligneous stalks, which rise near twenty feet high, sending out several, strong, ligneous branches, covered with a light, brown, rough bark, garnished with thick oval leaves, rough on their upper surface, and of a dark green colour, but pale and smoother on their under side, standing upon pretty long foot-stalks. The flowers are produced in spikes from the wings of the branches; they are small, white, and shaped like those of the other species, and are succeeded by small succulent berries, each including two or three oblong seeds.

The seventh fort grows in the same country; this has woody stalks, which rise five or six feet high, from which spring out many slender ligneous branches, garnished with oval spear-shaped leaves, which are rounded at each end, but have acute points, of a dark green on their upper surface, but have a white down on their under side, sitting close to the branches. The flowers are produced from the wings of the stalks, and also at the top, formed in slender branching spikes, which are recurved; they are white, and are succeeded by small succulent berries, which contain two or three seeds.

The eighth fort grows naturally at *Campeachy*; this plant has low shrubby stalks, which seldom rise more than three feet high, sending out a few, slender, ligneous branches, garnished with rough spear-shaped leaves, sitting close to the branches, of a dark green on their upper side, but pale on their under. The flowers come out in single spikes from

from the wings of the stalk; they are white, and are succeeded by small succulent berries like the former sort.

These plants are propagated by seeds or cuttings; if by seeds, they must be procured from the countries where they grow naturally; these should be sown in small pots filled with light earth, and plunged into a hot-bed of tanners bark. These seeds sometimes grow the first year, but they often remain in the ground a whole year; therefore, if the plants should not come up the same season, the pots should be plunged in autumn into the tan-bed in the stove, where they should remain all the winter; and in the spring they should be removed out, and plunged into a fresh tan-bed, which will soon bring up the plants, if the seeds were good. When these are fit to remove, they should be each planted in a small pot, and plunged into a tan-bed, where they must be shaded from the sun till they have taken new root; and then they must be treated in the same way as other tender plants from the same countries, which require to be kept constantly in the bark-stove. The plants raised from cuttings, must be treated in the same way.

TOXICODENDRON. *Tourn. Inst. R. H. 610. tab. 381.*
Poison-tree.

The Characters are,

The male flowers are upon different plants from the female; they have a small empalement, cut into five points at the brim, but have no petals; they have five short stamina, terminated by roundish summits. The female flowers have empalements like the male; they have no stamina, but in the center is situated a roundish germen, supporting three small styles, crowned with globular stigmas. The germen afterwards turns to a berry with one or two cells, inclosing one seed in each.

The Species are,

1. TOXICODENDRON *foliis ternatis, foliolis obcordatis, glabris, integerrimis, caule radicante.* Poison-tree with trifoliate leaves, having roundish, heart-shaped, smooth, entire leaves, and a stalk putting out roots; called Poison Oak.

2. TOXICODENDRON *foliis ternatis, foliolis ovatis inciso-angulatis pubescentibus.* Poison-tree with trifoliate leaves, whose lobes are oval, angularly cut, and covered with soft short hairs.

3. TOXICODENDRON *foliis ternatis, foliolis ovato-lanceolatis glabris, caule erecto fruticoso.* Poison-tree with trifoliate leaves, whose lobes are oval, spear-shaped, smooth, and an erect shrubby stalk.

4. TOXICODENDRON *foliis pinnatis, foliolis ovato-lanceolatis integerrimis.* Poison-tree with winged leaves, whose lobes are oval, spear-shaped, and entire; called Poison Ash.

5. TOXICODENDRON *foliis ternatis, foliolis ovatis crenatodentatis glabris.* Poison-tree with trifoliate leaves, whose lobes are oval, smooth, and bluntly indented.

6. TOXICODENDRON *foliis ternatis, foliolis ovatis inciso-sinuatis glabris, caule volubili radicante.* Poison-tree with trifoliate leaves, whose lobes are oval, smooth, and cut into sinuses, and a twining rooting stalk.

7. TOXICODENDRON *foliis sæpius ternatis, foliolis oblongo-ovatis rugosis serratis, caule radicante.* Poison-tree with leaves, which are generally trifoliate, oblong, oval, rough, sawed lobes, and a rooting stalk.

8. TOXICODENDRON *foliis ternatis, foliolis lanceolatis superne inæqualiter serratis, subtus tomentosis, caule arborescente.* Poison-tree with trifoliate leaves, spear-shaped lobes, unequally sawed toward their points, downy on their under side, and a tree-like stalk.

9. TOXICODENDRON *foliis ternatis, foliolis ovato-lanceolatis acuminatis glabris, caule fruticoso ramoso.* Poison-tree with trifoliate leaves, having oval, spear-shaped, acute-pointed, smooth lobes, and a shrubby branching stalk.

The first sort grows naturally in most parts of *North America*; it has a low shrubby stalk, which seldom rises

more than three or four feet high, sending out shoots near the bottom, which trail upon the ground, putting out roots from their joints, whereby it multiplies and spreads greatly; so that when it is not confined, or trained up to a support, the stalks seldom rise upward. If the stalks happen to be close to a wall, they emit roots which fasten to the joints in the wall, and support themselves when they are severed from the root; and the stalks of such plants will become more ligneous, and rise much higher, than those which grow in the ground. The foot-stalks of the leaves are near a foot long; the leaves are composed of three smooth, oval, heart-shaped lobes, which are entire. The flowers come out from the side of the stalk in loose panicles, of an herbaceous colour, and small, so make no great appearance. Some plants have only male flowers with five stamina in each; these decay without producing fruit; but upon other plants there are only female flowers, which have a germen and three very short styles; these are succeeded by roundish, channelled, smooth berries, of a yellowish gray colour, which inclose one or two seeds.

This plant, when once planted in a garden, will propagate fast enough by its trailing branches, which put out roots at every part. It will thrive in almost any soil or situation.

The second sort grows naturally in most parts of *North America*. The stalks of this rise higher than those of the former; the branches are slender, but ligneous; they have a brown bark, and are garnished with downy leaves, standing upon pretty long foot-stalks, composed of three oval lobes, indented angularly, and hoary on their under side. The male flowers, which are produced on separate plants from the fruit, come out from the side of the stalks in close short spikes; these are of an herbaceous colour, and have five short stamina in each. The female flowers are produced in loose panicles; these are in shape and colour like the male, but larger, and have a roundish germen, supporting three very short styles, and are succeeded by roundish berries, which ripen in autumn.

The third sort grows naturally in *North America*; this has a shrubby, erect, branching stalk, which rises six or seven feet high, covered with a brown bark, garnished with smooth trifoliate leaves, whose lobes are oval, spear-shaped, and have a few sinuated indentures on their borders. The male and female flowers grow upon separate plants; their shape and colour like those of the former, and the fruit is also like that.

The fourth sort grows naturally in *Virginia, Pennsylvania, New England, and Carolina*; from all these countries I have received seeds: it also grows in *Japan*. This, in the countries where it grows naturally, rises with a strong woody stalk to the height of twenty feet or upward; but in *England* we seldom see any of them more than five or six; the reason of this is from the plants being tender, so are destroyed in severe winters; but I have seen some plants, which were kept in pots and sheltered in winter, upward of ten feet high, in the garden of *Samuel Reynardson, Esq;* at *Hillendon*, which, after his death, were purchased with all his other exotick plants, by *Sir Robert Walpole*. This has a strong woody stalk, covered with a light brown bark, inclining to gray. The branches are garnished with winged leaves, composed of three or four pair of lobes, terminated by an odd one. The lobes vary greatly in their shape, but for the most part they are oval and spear-shaped; they are sometimes rounded at their base, but generally end in acute points; their upper surface is smooth, of a lucid green, but their under side is pale, and a little hairy. The foot-stalks of the leaves change to a bright purple colour toward the latter part of summer, and in autumn all the leaves are of a beautiful purple colour before they fall off. The male flowers

flowers are produced upon loose panicles from the wings of the branches; they are small, of an herbaceous white colour, composed of five small roundish petals, and have five short stamina within, terminated by roundish summits. The female flowers are upon separate plants from the male, and are disposed on loose panicles; these are shaped like the male, but are somewhat larger, and have in their center a roundish germen, supporting three very short styles, crowned with globular stigmas. The germen afterward turns to a berry, variable in shape, sometimes almost oval, at others shaped like a small spear; but the most general form is roundish, with a protuberance almost like the Cicer; these include one seed. It flowers in July, and in warm seasons the female plants produce fruit, but they seldom ripen here.

This is undoubtedly the same plant which is mentioned by Dr. *Kempfer* in his *Amœnitates Exoticarum*, by the title of *Sitz*, vel *Sitz Adju*, or *Arbor vernicifera legitima, folio pinnato juglandis, fructu racemosa Ciceris facie*. Fasc. v. p. 791, 792. The true Varnish-tree, with a Walnut-tree leaf, and a branching fruit-like Cicers. But the figure he has exhibited of it, is the most inaccurate of any perhaps to be found in any of the modern books of botany; it is drawn from a side shoot of a branch which has been cut off, so has neither flower or fruit to it, and being a vigorous shoot, the leaves are very different in size and shape from those on plants which have not been headed; and his description of the leaves seems to have been taken from this branch, otherwise he could not have compared them to those of the Walnut-tree. He seems to have been conscious of this fault, by his adding another figure of the plant in small under his own; taken from a *Japan* herbal, in which there is a much better representation of it than his own conveys. How a person who was employing himself in making drawings of plants in a country, where the natural history of it was so little known, should make choice of such an imperfect sample for his figure, is amazing, for there can be no doubt of his meeting with perfect plants in flower or fruit, in a place where the shrubs are cultivated so plentifully as he mentions; and in his description of it, he sets out by comparing the height of the shrubs to those of Willow, than which he could not have chosen any plant by way of comparison, which would have conveyed a more indetermined idea; for it is well known there are different species of Willow, whose growth is from four to forty feet high; therefore there can be no other way of reconciling his description with what he afterward mentions, unless when he is giving an account of the method used by the natives in collecting the varnish; where he says the shrubs are cut down every third year, but by comparing their growth with that of the Willows, which are cut down for fuel, &c. every four or five years.

However, as the dried samples of the plant which he brought over, agrees with the *American* Toxicodendron, and the milky juice of both have the same qualities of staining, so there can be no doubt of the plants being the same; therefore if it is thought that varnish may be of publick utility, it may be collected in plenty in most of the *English* settlements in *North America*.

Kempfer has also given a figure and description of a spurious Varnish-tree, which is called *Fasi-no-Ki* by the natives, and is by him titled *Arbor vernicifera spuria, sylvestris angustifolia*. Spurious wild Varnish-tree with a narrow leaf, which he says agrees with the other in every part, excepting the lobes of the leaves, which are narrower. This led me into a mistake in the former editions of the *Gardeners Dictionary*, by supposing their difference might arise from culture only; but having since raised from seeds a shrub which has all the appearance of his spurious Varnish-tree, and is evidently a distinct species, if not of a different genus

from the true sort, I am certain *Kempfer* has been guilty of a great mistake in this particular. The seeds of this were sent from *China*, for those of the Varnish-tree; but when I sowed them, I remarked they were pretty much shaped like those of the Beech-tree, but smaller; being thick on one side and slender on the other, in shape of a wedge, from whence I supposed there were three of the seeds included in one capsule. There is a shrub of this kind now growing in the *Chelsea* garden, which is more than fifteen feet high; but, as it has not yet produced flowers, I am at a loss where to range it.

The fifth sort grows naturally in *North America*, from whence the seeds were a few years since brought to *England*. This has a shrubby stalk, which sends out many ligneous branches, covered with a smooth purple bark, garnished with smooth trifoliate leaves, standing upon foot-stalks an inch long; the lobes are oval, of a deep lucid green on their upper side, but of a pale green on their under, deeply crenated or indented on their edges, their base joining close to the foot-stalks. The leaves, when bruised, emit an odour like that of Orange peel, from whence the gardeners have titled it the sweet-scented Toxicodendron. The male flowers are produced in short close panicles; they are small, of an herbaceous white colour; they are upon separate plants from the fruit, which grow in sparfed panicles, and are of an oval shape.

The sixth sort grows naturally in *North America*. The stalks of this sort emit roots their whole length, whereby they fasten to trees or any neighbouring support, and climb to the height of six or eight feet, garnished with trifoliate oval leaves, which are smooth, and cut into sinuses on their edges. The flowers are produced in short panicles from the side of the branches; they are male and female on different plants like the other species.

The seventh sort was sent me by Mr. *John Bartram* from *Philadelphia*, by the title of Great Toxicodendron; this hath trailing roots, which run near the surface of the ground, sending up stalks in different places; the leaves stand upon long foot-stalks, composed of three or four obtuse rough lobes, sawed on their edges.

The first, sixth, and seventh sorts propagate in plenty by their creeping stalks and roots; the others are propagated by laying down their branches, which will put out roots in one year, and may then be taken off and transplanted, either in the places where they are to remain, or in a nursery to grow two or three years, to get strength before they are planted out for good; they may also be propagated by seeds, which should be sown on a bed of light earth, and when the plants come up, they must be kept clean from weeds the following summer; and before the frost comes on in autumn, the bed should be hooped over, that the plants may be covered with mats, for otherwise the early frosts will kill their tops, which frequently causes their stalks to decay to the ground; for as the young plants are tender, and generally shoot late the first year, they are in much greater danger than when they get more strength. In spring the plants may be transplanted into nursery-beds to grow a year or two, and may then be transplanted for good.

These plants are preserved by the curious in botany, for the sake of variety; but as there is little beauty in them, there are not many of the sorts cultivated in *England*. The wood of these trees, when burnt, emits a noxious fume, which will suffocate animals when they are shut up in a room where it is burnt: an instance of this is mentioned in the *Philosophical Transactions* by Dr. *William Sherard*, which was communicated to him in a letter from *New England* by Mr. *Moore*, in which he mentions some people who had cut some of this wood for fuel, which they were burning, and in a short time they lost the use of their limbs, and became

stupid; so that if a neighbour had not accidentally opened the door, and seen them in that condition, it is generally believed they would soon have perished. This should caution people from making use of this wood for such purpose.

When a person is poisoned by handling this wood, in a few hours he feels an itching pain, which provokes a scratching, which is followed by an inflammation and swelling. Sometimes a person has had his legs poisoned, which have run with water. Some of the inhabitants of *America* affirm, they can distinguish this wood by the touch in the dark, from its extreme coldness, which is like ice; but what is mentioned of this poisonous quality, is most applicable to the fourth sort here mentioned, which, by the description, agrees with this species.

The juice of the tree is milky, when it first issues out of the wounded part; but soon after it is exposed to the air, it turns black, and has a very strong foetid scent, and is corroding; for I have observed, on cutting off a small branch from one of these shrubs, that the blade of the knife has been changed black in a moment's time, so far as the juice had spread over it, which I could not get off without grinding the knife.

The eighth sort grows naturally in *Jamaica* on the red hills, and at *Campeachy* in great plenty. It has a thick woody stem, which rises near thirty feet high, with a smooth Ash-coloured bark, sending out ligneous branches on every side, which have a hairy rusty-coloured bark, garnished with trifoliate leaves, which have hairy foot-stalks. The lobes are spear-shaped, unequally sawed toward the top, and have many transverse veins running from the midrib to the borders, and have a brown woolly down on their under side. The flowers are ranged in a single racemus, which springs from the wings of the branches; they are small, of a yellowish colour, and the female flowers are succeeded by small oval berries, of an Orange colour when ripe.

The ninth sort grows naturally about *Carthage* in *New Spain*; this rises with a shrubby stalk twelve or fourteen feet high, covered with a gray bark, sending out a great number of branches on every side, which are garnished with trifoliate smooth leaves, whose lobes are oval, spear-shaped, and oblique to their foot-stalks. The male and female flowers are upon different plants; they are formed in loose panicles, are small, and of a dirty white colour. The female flowers are succeeded by small, oval, smooth berries, each including one seed.

The two last sorts are tender plants, so will not thrive in this country, without the assistance of artificial heat; they are propagated by seeds, when these can be procured from the countries where the plants grow naturally. These should be sown as soon as they arrive here, in pots filled with light earth, and plunged into a tan-bed. Sometimes the plants will come up the same year, but the seeds often lie long in the ground when they are sown in the spring; and when they do not grow the first year, the pots should be plunged in the bark-bed in the stove in autumn, where they may remain all the winter; and in the spring they should be plunged into a fresh hot-bed under a frame, which will soon bring up the plants. When these are fit to remove, they should be each planted in a small pot, filled with light earth, and plunged into a new tan-bed, observing to shade them from the sun till they have taken new root; then they should be treated in the same way as other tender exotick plants, which are constantly kept in the bark-stove.

TRACHELIUM. *Tourn. Inst. R. H.* 130. tab. 50. *Lin. Gen. Plant.* 204. Throatwort.

The Characters are,

The flower has a small empalement, cut at the top in five parts, sitting upon the germen. The flower has one petal, which is funnel shaped, having a long, slender, cylindrical tube, cut at

the top into five small oval segments, which spread open; it has five hair-like stamina the length of the petal; terminated by single summits; and a roundish three-cornered germen, situated under the flower, supporting a long slender style, crowned by a globular stigma. The germen afterward turns to a roundish obtuse capsule with three lobes, having three cells, which are filled with small seeds.

We have but one Species of this genus in the *English* gardens, viz.

TRACHELIUM. *Hort. Upsal.* 41. Blue Mountain Throatwort.

This plant grows naturally in shady woods in many parts of *Italy*. It has a perennial root, which is fleshy and tuberos. The leaves are oval, spear-shaped, sawed on their edges, ending in acute points. The stalks rise a foot and a half high, garnished with leaves, shaped like those at the bottom, but come out irregularly. Sometimes there are two pretty large leaves, and one or two smaller rising from the same joint; at others, one large and three smaller; these come out alternate, and the upper part of the stalk, immediately under the umbel, is naked of leaves, except two or three narrow ones, which are close to the foot-stalks of the flowers; these are disposed in form of an umbel, composed of many small umbels. The flowers are small, funnel-shaped, and of an azure blue colour; these are succeeded by roundish capsules, with three cells, filled with small seeds, which ripen in autumn.

This plant is propagated by seeds, which should be sown in autumn soon after they are ripe; for when they are kept out of the ground till spring, they frequently fail, or if they do grow, it is not before the following spring. When the plants come up, they should be kept clean from weeds, and as soon as they are big enough to remove, should be transplanted on an east aspected border of light undunged earth, placing them in rows six inches apart, and four inches distant in the rows, shading them from the sun till they have taken new root; after which they require no other care but to keep them clean from weeds till autumn, when they may be transplanted into the borders of the flower-garden, where they will flower the following summer.

But as these plants thrive better on old walls, when by accident they have arisen there from seeds, so their seeds, when ripe, may be scattered on such walls as are old, or where there is earth lodged sufficient to receive the seeds, where the plants will come up and resist the cold much better, and continue longer than when sown in the full ground; and when a few of the plants are established on the walls, they will shed their seeds, so that they will maintain themselves without any farther care. I have observed some plants of this kind, which have grown from the joints of a wall, where there has not been the least earth to support them, which have resisted the cold, though they have been greatly exposed to the winds, when most of those in the full ground were killed; so that these plants are very proper to cover the walls of ruins, where they will have a very good effect.

TRADESCANTIA. *Lin. Gen. Plant.* 360. Spiderwort.

The Characters are,

The flower has a disformed sheath. The proper empalement is permanent, composed of three oval concave leaves. The flower has three roundish equal petals, which spread open, and six hairy slender styles, terminated by kidney-shaped summits, and an oval, obtuse, three-cornered germen, supporting a slender style, crowned by a triangular blunt stigma. The germen afterward turns to an oval capsule, shut up in the empalement, having three cells, containing a few angular seeds.

We have but one distinct Species of this genus, viz.

TRADESCANTIA. *Hort. Cliff.* 127. Spiderwort.

The root of this plant is composed of several fleshy fibres, which spread wide, from which arise many long, narrow, keeled leaves, which embrace each other at their base; they are veined, rough on their edges, of a grayish colour, and succulent; between the leaves arise a thick jointed stalk about a foot long, garnished at each joint with one leaf, whose base embraces it. At the top of the stalk are two leaves, which spread asunder; above these come out many flowers almost in a sort of umbel; these have a three-leaved empalement, and three large roundish petals, of a deep blue colour, which in the morning spread open flat, but in the middle of the day they shrink up, and do not open again; but there is a succession of flowers from the same bunch daily, for a considerable time. The germen afterward swells to a roundish capsule with three angles, having three cells, including a few angular seeds.

We have two other varieties of this plant, one with a white, the other has a purple flower; but these are supposed changeable from seeds.

It is easily propagated by seeds, which, if they are permitted to scatter, will produce plenty of young plants the following spring; or if the seeds are sown soon after they are ripe, the plants will come up the spring after; and when they are fit to remove, they should be planted in a nursery-bed at about nine inches distance, and the ground kept clean from weeds. In autumn they should be removed into the borders of the flower-garden, where they will flower and produce seeds, and the roots will continue several years.

TRAGACANTHA. *Tourn. Inst. R. H. 417. tab. 234.*
Goats-thorn.

The Characters are,

The empalement of the flower is indented in five parts, the lower segments being the shortest. The flower is of the butterfly kind; the standard is long, erect, indented at the point; the borders are reflexed. The wings are shorter than the standard. The keel is of the same length with the wings, and is indented; it has ten stamens, nine are joined and one is separated, terminated by roundish summits, and a sharp taper germen, supporting an awl-shaped style, crowned by an obtuse stigma. The germen afterward becomes a short swelling pod, having two longitudinal cells, including kidney-shaped seeds.

The Species are,

1. TRAGACANTHA *petiolis longioribus spinescentibus, foliis ovatis obtusis.* Goats-thorn with longer foot-stalks, ending in spines, having oval obtuse lobes to the leaves.

2. TRAGACANTHA *foliolis lanceolatis, floribus solitariis axillaribus, siliculis ovatis inflatis.* Goats-thorn with spear-shaped lobes, flowers proceeding singly from the sides of the branches, and oval, inflated, bladder pods.

3. TRAGACANTHA *foliolis lanceolatis acuminatis tomentosis, floribus alaribus terminalibusque.* Goats-thorn with spear-shaped, acute-pointed, woolly leaves, flowers growing on the sides, and at the ends of the branches.

4. TRAGACANTHA *foliolis linearibus glabris, floribus congestis axillaribus.* Goats-thorn with very narrow smooth leaves, and flowers growing in clusters on the sides of the branches.

The first sort grows naturally on the sea-shore about *Marseilles*, and in *Italy*; this has a thick, short, ligneous stalk, which branches out greatly on every side. The young branches are woolly, closely garnished with winged leaves, whose foot-stalks end in acute thorns. The lobes are small, oval, obtuse, and of a silvery colour. The flowers are large, white, and shaped like a butterfly; they are produced in clusters at the end of the branches, and are succeeded by short pods, having two longitudinal cells, containing two or three kidney-shaped seeds, which seldom ripen in *England*.

The second sort grows naturally in the islands of *Majorca* and *Minorca*; this hath a thick woody stalk, rising about two feet high, sending out many ligneous branches, closely garnished with small, spear-shaped, hoary leaves, ranged by pairs along a very strong foot-stalk, ending with a sharp thorn. The flowers are produced singly from the sides of the branches; they are large, white, and are succeeded by oval bladder pods, containing four kidney-shaped seeds, which do not ripen in *England*.

The third sort grows naturally in the islands of the *Archipelago*; this has a very low shrubby stalk, divided into many downy branches, garnished with winged leaves, composed of nine or ten pair of spear-shaped woolly lobes, ending in acute thorns. The flowers are produced from the side and at the top of the branches; they are white, and shaped like those of the other species, but smaller.

The fourth sort grows naturally in *Spain*; this is a very low plant. The stalks are pretty thick and woody, but seldom rise more than five or six inches high; dividing into several branches, closely garnished with small winged leaves, composed of several pair of small, linear, smooth lobes, of a bright green colour. The foot-stalks of these end in very sharp thorns, which stand out beyond the lobes; the flowers grow in clusters from the side of the stalks; they are smaller than those of the other species, and of a dirty white colour.

These sorts may be propagated by seeds, when they can be procured from the countries where the plants grow naturally, which should be sown on a bed of fresh earth in *April*; and when the plants come up, they should be carefully kept clean from weeds. If the season should prove very dry, it will be of great service to water the plants now and then; when they are large enough to transplant, they should be carefully taken up, and some of them planted in small pots, filled with fresh earth, placing them in the shade until they have taken new root; then they may be removed into an open situation, where they may remain till the latter end of *October*, when they should be placed under a common frame, where they may be sheltered from severe frost, but may have free air in mild weather.

The remainder of the plants may be planted on a warm dry bank, where they must be shaded until they take root; and if the season should continue dry, they must be refreshed with water, otherwise they will be in danger, because, while they are so young, their roots will not have established themselves in the ground sufficiently to nourish them in great droughts.

Those plants which were planted in pots, may be preserved under frames in winter, until they have obtained strength, when they may be shaken out of the pots, and planted in a lean dry soil and a warm situation, where they will endure the cold of our ordinary winters very well; but, as they are sometimes destroyed by hard frost, it will be proper to keep a plant of each kind in pots, which may be sheltered in winter to preserve the species.

These plants may also be propagated by slips, for as they rarely produce seeds in this country, the latter method is generally used here. The best time for this work is in *April*, just as the plants begin to shoot, at which time the tender branches of the plants should be slipped off, and their lower parts divested of the decayed leaves; then they should be planted on a very moderate hot bed, which should be covered with mats, to screen them from the great heat of the sun by day and the cold by night. These cuttings should be gently watered until they have taken root; then they may be exposed to the open air, observing always to keep them clear from weeds.

On this bed they may remain until the following spring, where, if the winter should be very severe, they may be

covered with mats as before; and in *April* they may be transplanted out either into pots, filled with sandy light earth, or into warm borders, where, if the soil be dry, gravelly, and poor, they will endure the severest cold of our climate; but if they are planted in a very rich soil, they often decay in winter.

From one species of this genus, Monsieur *Tournefort* says, the Gum Adragant, or Dragon, is produced in *Crete*.

TRAGIA. *Plum. Gen. Nov. 14. tab. 12.*

The Characters are,

It hath male and female flowers in the same plant. The empalement of the male flower is cut into three oval acute-pointed segments; it has no petals, but there are three stamina in each the length of the empalement, terminated by roundish summits. The empalement of the female flowers are permanent, cut into five oval concave segments. The flowers have no petals or stamina, but a roundish germen, having three furrows, supporting an erect style, crowned by a bifid spreading stigma. The germen afterward turns to a roundish three-lobed capsule, having three cells, each containing one globular seed.

The Species are,

1. TRAGIA *foliis cordato-oblongis, caule volubili. Lin. Sp. Plant. 980.* Tragia with oblong heart-shaped leaves, and a twining stalk.

2. TRAGIA *involutris fæmineis pentaphyllis pinnatifidis. Lin. Sp. Plant. 980.* Tragia with five-leaved involucri to the female flowers, which are wing-pointed.

The first sort grows plentifully in the *Savannas* in *Jamaica*, and other warm parts of *America*, where it twines round whatever plants or trees it grows near, and rises seven or eight feet high, having tough stems. The leaves are oblong, heart-shaped, ending in acute points, deeply sawed on their edges, standing alternately upon pretty long foot-stalks. The male flowers come out from the wings of the stalk in bunches of about two inches in length; the female flowers are produced on separate foot-stalks, arising from the same point as the male; these are succeeded by roundish capsules with three cells, each inclosing one roundish seed. The whole plant is covered with burning spines, like those of the *Nettle*, which renders it very unpleasant to handle.

The second sort grows naturally in *India*; this rises with an erect ligneous stalk about three feet high, which rarely sends out any side branches, garnished with oblong spear-shaped leaves, which end in very long acute points, sharply sawed on their edges, ranged alternately on the stalk, and are closely covered with yellowish stinging hairs. The flowers are produced in small clusters from the wings of the stalk, standing several together upon the same foot-stalk; the upper are all male, and the under female; the latter are succeeded by roundish capsules with three cells, each inclosing one seed.

As these are plants of no great beauty, they are seldom preserved in this country, except in some botanick gardens for variety; they are propagated by seeds, which must be sown on a hot-bed early in the spring, and afterward transplanted into pots, and plunged into a hot-bed of tanners bark, and treated in the same manner as other tender plants, which require to be kept in the bark-stove.

TRAGOPOGON. *Tourn. Inst. R. H. 477. tab. 270.* Goats-beard.

The Characters are,

The common empalement of the flower is single, composed of eight acute-pointed leaves, which are alternately large, joined at their base. The flower is composed of many hermaphrodite florets, which are uniform, of one petal, stretched out like a tongue, indented at their points in five parts, and lie over each other like the scales of fish; these have each five short hair-like stamina, terminated by cylindrical summits, and an oblong germen, situated

under the floret, supporting a slender style the length of the stamina, crowned by two revolving stigmas. The empalement of the flower afterward swells to a belly, inclosing many oblong, angular, rough seeds, slender at both ends, crowned by a feathery down.

The Species are,

1. TRAGOPOGON *calycibus corollæ radium æquantibus, foliis integris striatis. Lin. Sp. Plant. 789.* Goats-beard with an empalement equal to the rays of the flower, and entire leaves; or common Goats-beard.

2. TRAGOPOGON *calycibus corollæ radiis longioribus, foliis linearibus striatis.* Goats-beard with the empalement longer than the rays of the flower, and linear closed leaves; or small, yellow, Meadow Goats-beard.

3. TRAGOPOGON *calycibus corollæ radiis longioribus, foliis integris striatis, pedunculis supernè incrassatis. Hort. Upsal. 243.* Goats-beard with an empalement longer than the rays of the flower, entire closed leaves, and the foot-stalk thicker at the upper part; commonly called Salsafy.

4. TRAGOPOGON *calycibus corollæ radio longioribus, foliis integris, seminibus lævibus, disci plumosis, radii setaceis. Hort. Upsal. 243.* Goats-beard with an empalement longer than the rays of the flower, entire leaves, and smooth seeds, those of the disk being covered with a feathery down, and those on the borders bristly; another Goats-beard with a soft red flower.

5. TRAGOPOGON *calycibus corollæ radio brevioribus, foliis linearibus striatis, caule hirsuto.* Goats-beard with the empalement shorter than the rays of the flower, narrow closed leaves, and a hairy stalk; hairy Goats-beard.

6. TRAGOPOGON *calycibus corollæ brevioribus aculeatis, foliis pinnato-bastatis. Hort. Cliff. 382.* Goats-beard with prickly empalements, which are shorter than the petals, and arrow wing-pointed leaves; or rough Sowthistle of *Crete*.

The first sort grows naturally in the meadows of *Austria* and *Germany*; this is very different from the second, which grows naturally in *England*, for I have sown the seeds of both sorts several years in the same bed of earth, and have always found the plants have retained their difference. The lower leaves of this are three quarters of an inch broad at their base, where they embrace the stalk, and more than a foot long, closed together, ending in acute points. The stalk rises near three feet high, garnished at each joint with one leaf, of the same shape with those below, but smaller; it is terminated by one large yellow flower, composed of hermaphrodite florets, which lie over each other like the scales of fish; these are included in one common simple empalement, which is equal in length to the rays of the flower. Each floret is succeeded by an oblong seed, which is larger at the base than at the point, where it is crowned with a large feathery down. The seeds of the border or ray are crooked and rough, but those of the disk are straight and smooth.

The second sort grows naturally in moist pastures in many parts of *England*; it is by the common people titled Sleep-at-noon, or Go-to-bed-at-noon, because the flowers are generally closed up before that time every day. The lower leaves of this sort are almost as long as those of the first sort, but are not more than a third part so broad; they are of a deep green colour, and end in acute points. The stalks rise about a foot high, and sustain one yellow flower at the top, not more than half so large as those of the first; the empalements of these flowers are longer than the rays; and the seeds are much smaller than those of the other.

When this sort shoots up in stalks four inches high, the common people gather it out of the fields, and boil it in the same way as *Asparagus*, and some give it the preference.

The third sort is cultivated in gardens by the title of Salsafy. The roots of this are dressed in different ways, and served

served up to the table; but of late years some persons cultivate it for the stalks, which are cut in the spring when they are four or five inches high, which are dressed like Asparagus, in the like manner as the second sort. The stalks of this are much longer, and are tenderer than the other, so are better for the purpose than those of the second sort; the leaves are broad; the flowers are large and blue; the foot-stalk immediately under the flower is much thicker than below, and the empalement is longer than the rays of the flower.

The fourth sort grows naturally in *Italy*; this is of low stature. The stalks seldom rise a foot high; the leaves are long and narrow; the flowers are small, and of a pale red or Peach-blossom colour; the empalement is much longer than the rays of the flower, and the seeds are smooth.

The fifth sort grows naturally in *Istria*; this has narrow hairy leaves. The stalks rise about a foot and a half high, are naked most part of their length, very hairy, and sustain one pretty large yellow flower, whose empalement is much shorter than the rays of the flower, which is also very hairy.

The sixth sort grows naturally in *Crete*, and also in *Italy*; this is an annual plant, very like the Sowthistle in stalk and leaf, but the empalement of the flower is prickly. It is seldom admitted into gardens, because the seeds are wafted by the winds to a great distance, and thereby fill the garden with the plants.

These plants are propagated from seeds, which should be sown in *April* upon an open spot of ground, in rows about nine or ten inches distance; and when the plants are come up, they should be hoed out, leaving them about six inches asunder in the rows. The weeds should also be carefully hoed down as they are produced, otherwise they will soon overbear the plants, and spoil them. This is all the culture required, and if the soil be light and not too dry, the plants will have large roots before winter; at which time the Salsafy, whose roots are eaten at that season, will be fit for use, and may be taken up any time after their leaves begin to decay; but, when they begin to shoot again, they will be sticky, and not fit for use; but many persons cultivate this sort for the shoots, as was before mentioned.

The common yellow sort, whose shoots are sold in the market, will be fit for use in *April* or *May*, according to the forwardness of the season. The best time to cut them is, when their stems are about four inches long, for if they stand too long, they are never so tender as those which are cut while young.

Some people in cultivating these plants, sow their seeds in beds pretty close; and when they come up, they transplant them out in rows at the before mentioned distance; but, as they form tap-roots, which abound with a milky juice, when the extreme part of their roots is broken by transplanting, they seldom thrive well afterward; therefore, it is by far the better way to make shallow drills in the ground, and scatter the seeds therein, as before directed, whereby the rows will be at a due distance, and there will be nothing more to do than to hoe out the plants when they are too thick in the rows, which will be much less trouble than the other method of transplanting, and the plants will be much larger and fairer.

TRAGOSELINUM. See Pimpinella.

TRIBULUS. *Tourn. Inst. R. H. 265. tab. 141.* Cal-trops.

The Characters are,

The empalement of the flower is cut into five acute parts; there are five oblong blunt petals to the flower, which spread open, and ten small awl-shaped stamina, terminated by single summits, and an oblong germen the length of the stamina, having no style, but crowned by a headed stigma. The germen afterward turns to a roundish prickly fruit, divided into five capsules, armed

with three or four angular thorns on one side, joining together. The cells are transverse, and contain two or three Pear-shaped seeds.

The Species are,

1. TRIBULUS foliolis sexjugatis subæqualibus. *Hort. Cliff. 160.* Cal-trops with six pair of lobes to each leaf, which are almost equal.

2. TRIBULUS foliolis quadrijugis exterioribus majoribus. *Lin. Sp. Plant. 386.* Cal-trops with four pair of lobes to each leaf, of which the outer are the largest.

3. TRIBULUS foliolis octojugatis subæqualibus. *Lin. Sp. Plant. 387.* Cal-trops with eight pair of lobes to each leaf, which are almost equal.

The first sort is a very common weed in the south of *France*, in *Spain*, and *Italy*, where it grows among Corn, and on most of the arable land, and is very troublesome to the feet of cattle; for the fruit being armed with strong prickles, run into the feet of the cattle, which walk over the land. This is certainly the plant which is mentioned in *Virgil's Georgicks*, under the name of Tribulus, though most of his commentators have applied it to other plants.

It is called in *English* Cal-trops, from the form of the fruit, which resembles those instruments of war that were cast in the enemies way to annoy their horses.

This hath a slender fibrous root, from which spring out four or five slender hairy stalks, which spread flat on the ground, garnished at each joint with winged leaves, composed of six pair of narrow hairy lobes, almost of equal size; those on the lower part of the stalk stand alternately, but toward the top they are placed opposite. The flowers come out from the wings of the stalk, standing upon short foot-stalks; they are composed of five broad, obtuse, yellow petals, which spread open. In the center is situated an oblong germen, crowned by a headed stigma, attended by ten short stamina, terminated by single summits, and are succeeded by roundish, five-cornered, prickly fruit, which, when ripe, divides into five parts, each having a transverse cell, containing one or two seeds.

This plant is preserved in botanick gardens for variety. It is propagated by seeds, which should be sown in autumn, for those which are kept out of the ground till spring, commonly remain in the ground a whole year before the plants come up. These seeds should be sown on an open bed of light earth, where they are designed to remain; for, as it is an annual plant, it doth not bear transplanting very well, unless it be done when the plants are very young. In the spring, when the plants come up, they should be carefully cleared from weeds; and where they come up too close, some of the plants should be pulled out to give room for the remaining plants to grow; after this they will require no other culture but to keep them clear from weeds. If the seeds are permitted to scatter, the plants will come up the following spring, and maintain their place, if they are not overborne with weeds.

The second sort grows naturally in *Jamaica*, and some of the other islands in the *West-Indies*; this is an annual plant, with pretty thick, compressed, channelled stalks, which trail upon the ground, garnished with smooth winged leaves, placed by pairs opposite; they are sometimes composed of three, but most commonly of four pair of lobes, the outer being the largest. The flowers come out from the wings of the stalk; they are composed of five large yellow petals, which spread open, and have an agreeable odour; these are succeeded by roundish prickly fruit, ending in a long point, but seldom ripen in *England*.

The third sort grows naturally in the *West-Indies*; it was found by the late Dr. *Houssoun* at the *Havanna*; this has a ligneous root, from which spring out many stalks, which are hairy, jointed, and trail upon the ground, garnished

at each joint by winged leaves, which differ greatly in size, some being composed of eight pair of oblong lobes which are nearly equal, but opposite to these come out small leaves composed of but four pair of lobes. The large leaves stand alternately upon the stalks, and the small ones on the opposite side; at the wings of the stalks come out the foot-stalks of the flowers, which are hairy, and near two inches long, each sustaining one pale yellow flower, composed of five large petals, which have narrow tails, but are very broad and rounded at their points. The flowers are succeeded by roundish fruit armed with very acute spines, but these rarely ripen in *England*.

The two last sorts, being natives of hot countries, are very tender, so must be sown in pots in autumn, and plunged into the tan-bed in the stove; when the plants are come up, they must each be transplanted into a separate pot, and then plunged into a hot-bed of tanners bark, where they must be treated in the same manner as other tender exotic plants, being careful to bring them forward as early as possible in the summer, otherwise they will not perfect their seeds in this country.

The third sort will live through the winter, if it is plunged in the bark-stove, and treated in the same manner as other tender plants, and the following summer they will flower earlier, so there will be more time for the seeds to ripen.

TRICHOMANES, Maiden-hair.

There are three or four varieties of this plant, which grow naturally in *Europe*; but in *America* there is a great number of species, which are remarkably different from each other, as also from the *European* kinds.

These, being of the tribe of Ferns, or capillary plants, are seldom preserved in gardens. Their roots should be planted in moist shady places, especially the *European* sorts, which commonly grow from between the joints of old walls, and in other very moist shady situations; but those sorts which are brought from hot countries, must be planted in pots filled with rubbish, and strong earth mixed, and in winter they must be screened from hard frosts, to which, if they are exposed, it will destroy them.

The common sort in *England* is generally sold in the markets for the true Maiden hair, which is a very different plant, and not to be found in *England*, it being a native of the south of *France*, and other warm countries, so is rarely brought to *England*.

TRICOSANTHES. *Lin. Gen. Plant.* 966.

The Characters are,

It has male and female flowers, at separate distances, on the same plant. The male flowers have a long smooth empalement of one leaf, cut into five small segments which are reflexed; the petal is plain, spreading, and cut into five parts, ending in long branching hairs; they have three short stamina arising from the point of the empalement, terminated by cylindrical erect summits joined in a body, and three small styles fastened to the empalement. The female flowers sit upon the germen, and have empalements and petals like the male flowers, but have no stamina; they have a long slender germen situated under the flower, supporting a style the length of the empalement, crowned by three oblong stigmas. The germen afterward turns to a long succulent fruit, having three cells, inclosing many compressed seeds.

We have but one Species of this genus in the *English* gardens, viz.

TRICOSANTHES pomis teretibus oblongis. *Hort. Cliff.* 450. Tricosanthes with a taper, oblong, incurved fruit.

This plant grows naturally in *China*, it is an annual, and of the *Cucumber* tribe. The stalks run to a great length, and, if they are not supported, trail upon the ground, in the same manner as *Cucumbers* and *Melons*. The leaves are angular and rough; the flowers come out from the side of the stalks; they are white, and cut into many small filaments or threads. The fruit is taper, near a foot long,

incurved, and divided into three cells, which include many compressed seeds like those of *Cucumber*.

It is propagated by seeds, which must be sown on a hot-bed early in the spring, and afterwards treated in the same way as *Cucumbers* and *Melons*, keeping them covered with glasses, otherwise they will not ripen their fruit here.

TRICHOSTEMMA. *Gron. Flor. Virg.* 64. *Lin. Gen. Plant.* 652.

The Characters are,

The flower has a lipped empalement; the upper lip is twice as large as the under, cut into three equal acute segments, the under lip in two. The flower is of the lip-kind, and has a very short tube; the upper lip is compressed and hooked, the under is cut into three parts, the middle one being the least; it has four hair-like stamina which are long and incurved, two of them being a little shorter than the other, terminated by single summits, and a four-pointed germen, supporting a slender style, crowned by a bifid stigma. The germen afterward turn to four roundish seeds, inclosed in the swollen empalement of the flower.

The Species are,

1. TRICHOSTEMMA staminibus longissimis exsertis. *Lin. Sp. Plant.* 598. Trichostemma with the longest stretched-out stamina.

2. TRICHOSTEMMA staminibus brevibus inclusis. *Lin. Sp. Plant.* 598. Trichostemma with shorter stamina included in the petal.

The first sort grows naturally in many parts of *North America*; it is an annual plant, which rises about six or eight inches high, dividing into small branches, garnished with small roundish leaves, not unlike those of sweet *Marjoram*, placed opposite, covered with fine, small, downy hairs. The flowers are produced at the wings of the branches; they are small, of a purple colour, gaping with two lips; the upper lip is arched, and is much larger than the lower; it is cut into three acute points; the lower lip is small, and cut into two points. These appear late in *August*, so that unless the season proves warm, the seeds will not ripen in *England*.

The second sort grows naturally in *Virginia*; this hath an herbaceous, angular, branching stalk, which rises from nine inches to a foot high; the leaves stand by pairs on the branches, shaped like those of the wild *Marjoram*; are a little hairy, and sit close to the branches; the flowers are produced at the top of the branches; they are small, of a purple colour. The four stamina stand within the tube of the flower; these flowers do not appear till the end of summer, so the seeds seldom ripen here.

They are propagated by seeds, which should be sown in pots in autumn; and in winter the pots should be placed under a frame to shelter them from severe frost, but should be exposed to the open air at all times when the weather is mild. In the spring the plants will appear; and when they are fit to remove, they should be planted on a bed of light earth, shading them from the sun till they have taken fresh root, then they will require no other culture but to keep them clean from weeds.

TRIDAX. *Lin. Gen. Plant.* 872. *American Starwort*.

The Characters are,

The flower has a common, cylindrical, imbricated empalement. The scales are acute-pointed, and erect. The flowers are composed of hermaphrodite florets in the disk, and the rays of female half florets. The hermaphrodite florets are funnel-shaped, cut at the brim into five points; these have five short hair-like stamina, terminated by cylindrical summits joined together, and an oblong crowned germen, supporting a bristly style, crowned by an obtuse stigma. The germen afterward becomes an oblong single seed, crowned with a simple down. The female half florets are plain, of one petal, cut into three segments at the top; these have an oval germen like the hermaphrodite florets, but no stamina, and are succeeded by single seeds of the same shape.

We know but one *Species* of this genus, *viz.*

TRIDAX. Hort. Cliff. 418. Trailing Starwort with a whitish copper coloured flower, and hairy jagged leaves.

This plant was discovered by the late Dr. *Houftoun*, growing naturally by the road side leading to old *La Vera Cruz*, in *America*. The stalks are herbaceous, hairy, and trail upon the ground, emitting roots at their joints, whereby it spreads and propagates, garnished with rough hairy leaves placed by pairs, ending in acute points, and are acutely jagged on their edges. The flowers are produced upon long naked foot-stalks, which terminate their branches. They have one common empalement, composed of oval scales, ending in acute points, which lie over each other like the scales of fish; within which are ranged many female half florets, which compose the border or rays, and a good number of hermaphrodite florets, which form the disk or middle; these are of a pale copper colour, inclining to white, and are each succeeded by a single oblong seed, crowned with down.

This plant is propagated by seeds, which should be sown in pots and plunged into a hot-bed; when the plants come up and are fit to remove, they should be each planted in a small pot and plunged into a hot-bed of tanners bark, observing to shade them from the sun till they have taken new root; then they must be treated in the same way as other tender plants from the *West Indies*, placing them in the bark-stove in autumn, where they should constantly remain.

It may also be propagated by its trailing stalks, which frequently put out roots at their joints; if these are cut off and planted, they will make new plants. This plant does not produce flowers in plenty here, and but rarely perfects its seeds in *England*.

TRIFOLIUM. Tourn. Inst. R. H. 404. tab. 228. Trefoil, or Clover.

The Characters are,

This flower has a tubulous permanent empalement of one leaf. It is of the butterfly kind, drying in the empalement. The standard is reflexed, the wings are shorter than the standard, and the keel is shorter than the wings; it has ten stamina, nine are joined, and one is separate, terminated by single summits; and an almost oval germen supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes a short pod with one valve, containing a few roundish seeds.

There are a great number of species of this genus, several of which grow naturally in *England*, and others in many parts of *Europe*; but as great part of them are plants of small estimation, they are rarely cultivated either in the field or garden; therefore it would be swelling this work too much to enumerate them all here, so I shall select only such of them as are cultivated either for use or beauty.

The Species are,

1. TRIFOLIUM caule erecto, foliolis oblongo-ovatis integerrimis, spicis ovatis, calycibus setaceis. Trefoil with an erect stalk, oblong, oval, entire leaves, and oval spikes of flowers; or the Red Dutch Clover.

2. TRIFOLIUM capitulis umbellaribus leguminibus tetraspermis, caule repente. Lin. Sp. Plant. 767. Trefoil with umbellated heads, pods having four seeds, and a creeping stalk; White Meadow Trefoil, Honeysuckle-grass, or White Dutch Clover.

3. TRIFOLIUM spicis ovalibus imbricatis, vexillis deflexis persistentibus, calycibus nudis, caule erecto. Flor. Suec. 617. Trefoil with oval imbricated spikes of flowers, having deflexed permanent standards, naked empalements, and an erect stalk; Yellow Meadow Trefoil, or Hop Clover.

4. TRIFOLIUM spicis imbricatis, vexillis deflexis persistentibus, calycibus pedicellatis, caulibus procumbentibus. Lin. Sp. Plant. 773. Trefoil with imbricated spikes of flowers, having deflexed permanent standards, empalements standing

upon foot-stalks, and trailing stalks; the least Yellow Hop Trefoil, called None-such, or Black Seed.

5. TRIFOLIUM spicis ovatis, calycibus foliatis, caule erecto villoso, foliolis lanceolatis. Trefoil with oval spikes of flowers, having leafy empalements, an erect hairy stalk, and spear-shaped leaves; greater hairy Meadow Trefoil, with a whitish Sulphur or copper-coloured flower.

6. TRIFOLIUM spicis villosis oblongis obtusis aphyllis, foliolis subrotundis. Flor. Leyd. 380. Trefoil with oblong, blunt, hairy spikes of flowers without leaves, and roundish lobes.

7. TRIFOLIUM spicis villosis longis, corollis monopetalis, caule erecto, foliis ferrulatis. Lin. Sp. Plant. 768. Trefoil with long hairy spikes of flowers having one petal, an erect stalk, and leaves very slightly sawed.

8. TRIFOLIUM spicis villosis conico-oblongis, dentibus calycinis setaceis, subaqualibus, foliolis linearibus. Hort. Cliff. 375. Trefoil with oblong, conical, hairy spikes, having bristly indentures to the empalements, which are almost equal, and linear lobes to the leaves.

9. TRIFOLIUM spicis villosis ovalibus, dentatis calycinis setaceis aequalibus. Hort. Cliff. 375. Trefoil with oval hoary spikes, and bristly indentures to the empalements which are equal; or Hares-foot Trefoil.

10. TRIFOLIUM capitulis subrotundis, calycibus inflatis bidentatis reflexis, caulibus repentibus. Hort. Cliff. 373. Trefoil with roundish heads, reflexed bladder empalements with two teeth, and a creeping stalk; Strawberry Trefoil.

11. TRIFOLIUM leguminibus racemosis nudis dispermis, caule erecto. Hort. Cliff. 376. Trefoil with long naked bunches of pods containing two seeds, and an erect stalk; or Common Melilot.

12. TRIFOLIUM spicis oblongis, leguminibus seminudis mucronatis, caule erecto. Hort. Cliff. 375. Trefoil with oblong spikes, half naked acute-pointed pods, and an upright stalk; Sweet Melilot Trefoil.

The first sort, which is well known in *England* by the title of Red Clover, needs no description; this has been frequently confounded with the red Meadow Trefoil by the botanists, who have supposed they were the same species; but I have often sown the seeds of both in the same bed, which have constantly produced the two species without varying. The stalks of the Meadow Trefoil are weak and hairy, the stipulæ which embrace the foot stalks of the leaves are narrow and very hairy; the heads of flowers are rounder and not so hairy as those of the Clover, whose stalks are strong, almost smooth, furrowed, and rise twice the height of the other; the heads of flowers are large, oval, and hairy; the petal of the flowers open much wider, and their tubes are shorter than those of the other; but the Clover has been so much cultivated in *England* for near a hundred years past, that the seeds have been scattered over many of the *English* pastures, so that there are few of them which have not Clover mixed with the other Grasses; and this has often deceived the botanists, who have supposed that the Meadow Trefoil has been improved to this by dressing of the land.

Since the red Clover has been cultivated in *England*, there has been great improvement made of the clay lands, which before produced little but Rye-grass, and other coarse bents, which, by being sown with red Clover, have produced more than six times the quantity of fodder they formerly had on the same land; whereby the farmers have been enabled to feed a much greater stock of cattle, than they could do before, with the same extent of ground, which has enriched the ground, and prepared it for corn; so where the land is kept in tillage, it is the usual method now amongst the farmers to lay down their ground with Clover, after having had two crops of Corn, whereby there is a constant rotation of Wheat, Barley, Clover, or Turneps, on the same land. The Clover seed is generally sown with

with the Barley in the spring, and when the Barley is taken off, the Clover spreads and covers the ground, and this remains two years, after which the land is ploughed again for Corn.

The Clover is a biennial plant, whose roots decay after they have produced seeds; but by eating it down, or mowing it when it begins to flower, it causes the roots to send out new shoots, whereby the plant is continued longer than it would naturally do. The common allowance of seed for an acre of ground is ten pounds. In the choice of the seeds, that which is of a bright yellow colour inclining to brown should be preferred; and the pale-coloured thin seed should be rejected. The Clover-seed should be sown after the Barley is harrowed in, otherwise it will be buried too deep; and after the seeds are sown, the ground should be rolled, which will press the seeds into the ground; but this should be done in dry weather, for moisture will often cause the seeds to burst, and when the ground is wet the seeds will stick to the roll. This is the method which is generally practised by most people in sowing of this seed with Corn, but it will be much better if sown alone; for the Corn prevents the growth of the plants until it is reaped, and taken off the ground, so that one whole season is lost; and many times, if there be a great crop of Corn upon the ground, it spoils the Clover, so that it is hardly worth standing; whereas, when it is sown without any other seed, the plants will come up more equal, and come on much faster than that which was sown the spring before under Corn.

Therefore, from many years trial, I would advise the seeds to be sown in *August*, when there is a prospect of rain soon after; for as the ground is at that season warm, so the first shower of rain will bring up the plants, and these will have time enough to get strength before the winter: and if some time in *October*, when the ground is not too wet, the Clover is well rolled, it will press the ground close to the roots, and cause the plants to send out more shoots; the same should be repeated in *March*, which will be found very serviceable to the Clover. The reason of my preferring this season for the sowing of the seeds rather than the spring is, because the ground is cold and wet in spring, and if much rain fall after the seeds are sown, they will rot in the ground; and many times when the seed is sown late in the spring, if the season should prove dry, the seeds will not grow; so that I have always found the other season has been the surest.

About the middle of *May* this Grass will be fit to cut, when there should be great care taken in making it; for it will require a great deal more labour and time to dry than common Grass, and will shrink into less compass; but if it be not too rank, it will make extraordinary rich food for cattle. The time for cutting it is when it begins to flower; for if it stands much longer, the lower part of the stems, and the under leaves will begin to dry, whereby it will make a less quantity of hay, and that not so well flavoured.

Some people cut three crops in one year of this Grass; but the best way is to cut but one in the spring, and feed it the remaining part of the year, whereby the land will be enriched, and the plants will grow much stronger.

One acre of this plant will feed as many cattle as four or five acres of common Grass; but great care should be taken of the cattle, when they are first put into it, lest it burst them: to prevent which, some turn them in for a few hours only at first, and so stint them as to quantity; and this by degrees, letting them at first be only one hour in the middle of the day, when there is no moisture upon the Grass, and so every day suffer them to remain a longer time, until they are fully seasoned to it; but great care should be had never to turn them into this food in wet weather; or if they have been for some time accustomed to this food, it will be pro-

per to turn them out at night in wet weather, and let them have hay, which will prevent the ill consequences of this food; but there are some who give straw to their cattle while they are feeding upon this Grass, to prevent the ill effects of it; which must not be given them in the field, because they will not eat it where there is plenty of better food. There are others who sow Rye Grass amongst their Clover, which they let grow together, in order to prevent the ill consequences of the cattle feeding wholly on Clover; but this is not a commendable way, because the Rye Grass will greatly injure the Clover in its growth, and the seeds will scatter and fill the ground with bents.

Where the seeds are designed to be saved, the first crop in the spring should be permitted to stand until the seeds are ripe, which may be known by the stalks and heads changing to a brown colour; then it should be cut in a dry time; and when it is well dried, it may be housed until winter, when the seeds should be threshed out; but if the seeds are wanted for immediate sowing, it may be threshed before it be housed or stacked; but then it must be well dried, otherwise the seeds will not quit their husks.

It has been a great complaint amongst the farmers, that they could not thresh out these seeds without great labour and difficulty; which I take to be chiefly owing to their cutting the spring crop when it begins to flower, and so leave the second crop for seed, which ripens so late in autumn, that there is not heat enough to dry the husks sufficiently; whereby they are tough, and the seeds rendered difficult to get out; which may be entirely remedied by leaving the first crop for seed, as hath been directed; and then the ground will be ready to plough, and prepare for Wheat the same year, which is another advantage.

When cattle are fed with this hay, the best way is to put it in racks, otherwise they will tread a great quantity of it down with their feet. This feed is much better for most other cattle than milch cows, so that these should rarely have any of it, lest it prove hurtful to them; though when it is dry, it is not near so injurious to any sort of cattle as when green.

The second sort grows naturally in most of the pastures in *England*, and is generally known among the country people, by the title of white Honeysuckle.

This is an abiding plant, whose branches trail upon the ground, and send out roots from every joint, so that it thickens and makes the closest sward of any of the sown Grasses; and it is the sweetest feed for all sorts of cattle yet known; therefore when land is designed to be laid down for pasture, with intent to continue so, it should be sown with the seeds of this plant. The usual allowance of this seed is eight pounds to one acre of land; but this should never be sown with Corn, for if there is a crop of Corn, the Grass will be so weak under it, as to be scarce worth standing; but such is the covetousness of most farmers, that they will not be prevailed on to alter their old custom of laying down their grounds with a crop of Corn, though they lose twice the value of their Corn by the poorness of the Grass, which will never come to a good sward, and one whole season is also lost; for if this seed is sown in the spring without Corn, there will be a crop of hay to mow by the middle, or latter end of *July*, and a much better after-feed for cattle the following autumn and winter, than the Grass which is sown with Corn will produce the second year. The seed of this sort may also be sown in autumn, in the manner before directed for the common red Clover; and this autumnal sowing, if the seeds grow kindly, will afford a good early crop of hay the following spring; and if, after the hay is taken off the land, the ground is well rolled, it will cause the Clover to mat close upon the ground, and become a thick sward.

The seeds of this white *Dutch Clover* is annually imported from *Flanders*, by the way of *Holland*, from whence it received the name of *Dutch Clover*; not that it is more a native of that country than of this, for it is very common in moist pastures in every county in *England*; but the seeds were never collected for sowing in *England* till of late years; nor are there many persons at present here who save this seed, although it may be done, if the same care as is practised for the red Clover, is taken of this sort; therefore it should be recommended to every farmer, who is desirous to improve his land, carefully to sow an acre or two of this white Clover by itself for seeds, which will save him the expence of buying for some years when the price is great, and there will be no want of sale for any quantity they may have to spare.

The farther account of this Grass, may be seen under the article of PASTURE.

The third sort grows naturally among the Grass in most of the upland pastures in this country; but the seeds are frequently sold in the shops by the title of Hop Clover, and are by many people mixed with the other sorts of Clover and Grass-seeds, for laying down ground to pasture; this grows with upright branching stalks about a foot high, garnished with trifoliate leaves, whose lobes are oblong and heart-shaped, but reversed; the narrow point joining the foot-stalks. The flowers, which are yellow, grow from the wings of the stalk upon long foot-stalks, collected into oval imbricated heads having naked empalements, lying over each other like scales, somewhat like the flowers of Hops, from whence this plant had the title of Hop Clover. But there are two sorts of this which grow naturally in *England*. The other, which is the fourth sort, is a much smaller plant than this, and has trailing stalks. The heads of flowers are smaller, and the flowers are of a deeper yellow colour; these are not abiding plants, so are by no means proper to be sown, where the ground is designed to continue in pasture; but in such places where one or two crops only are taken, and the land is ploughed again for Corn, it may do well enough when it is mixed with other seeds, though the cattle are not very fond of it green, unless when it is very young. The large sort is the most profitable, but this is rarely to be had without a mixture of the small kind, and also of the smaller Melilot, which is commonly called None-such, or sometimes Black-seeds; for those who save the seeds for sale, are seldom curious enough to distinguish the sorts; but where the beauty of the verdure is considered, there must not be any of the seeds sown, because their yellow heads of flowers are very unsightly among the Grass; and if it is in gardens, where the Grass is constantly mowed, the flowers of these plants will come out near the root in such clusters; as to occasion large, unsightly, yellow patches; and as the heads decay, they turn brown, and have a very disagreeable appearance.

The fifth sort grows naturally on chalky lands in many parts of *England*; and in some countries the seed is sown after the same manner as the common red Clover, especially on chalky ground, where it will thrive, and produce a better crop than Clover. The stalks of this are hairy, and grow erect to the height of two feet or more, garnished with trifoliate leaves, standing upon long foot-stalks, whose lobes are longer than those of the red Clover, and have no marks of white; they are of a yellowish green colour, and are covered with soft hairs. The flowers grow in oval spikes at the end of the branches; they are of a pale copper colour; their petals are long and tubulous, but the brim is divided into two lips as the other sorts.

This is known by the title of Trefoil, in the places where it is cultivated; but the seedsmen sell the Hop Clover by that name, so they make no distinction between this, the Hop Clover, and None-such; therefore, by which of these three titles the seeds are bought, they prove the same.

This sort of Trefoil is much cultivated in that part of *Essex* which borders on *Cambridgeshire*.

The sixth sort grows naturally in *Spain* and *Italy*; this has upright stalks near two feet high, which are hairy, garnished with trifoliate leaves, having roundish lobes, which are sawed at their points. The flowers are produced at the top of the stalk in long, obtuse, hairy spikes, of a bright red colour, so make a pretty appearance during their continuance. It is an annual plant, so is not proper for sowing as fodder.

The seventh sort is an annual plant, which grows naturally in the south of *France* and *Italy*; it rises with a strong smooth stalk near three feet high, garnished with trifoliate leaves, whose lobes are two inches and a half long, and near a quarter broad, standing upon long foot stalks, which are embraced by stipulæ or sheaths their whole length. The flowers are produced at the top of the stalks in very long spikes; they are of a beautiful red colour, so make a fine appearance. It flowers in *July*, and the seeds ripen in autumn.

The eighth sort grows naturally in *Spain* and *Italy*; this rises with a slender stiff stalk near two feet high, garnished with trifoliate leaves, whose lobes are very narrow and hairy. The flowers are produced at the top of the stalks in oblong conical spikes; the indentures of their empalements end in long bristly hairs, which are almost equal in length; the spikes are hairy, and the flowers of a pale red colour.

The ninth sort is the common Haresfoot Trefoil, which grows naturally upon dry gravelly land in most parts of *England*, and is a sure indication of the sterility of the soil, for it is rarely seen upon good ground. This plant is seldom eaten by cattle, so is unfit for pasture, and is only mentioned here because it is sometimes used in medicine; it is an annual plant, whose root decays soon after it has perfected seeds.

The tenth sort grows naturally on arable land in many parts of *England*; this has trailing stalks, which put out roots at their joints. The leaves stand upon long slender foot-stalks; the lobes are roundish, and sawed on their edges; the flowers are collected in roundish heads, standing upon slender foot-stalks, which rise from the wings of the stalks; these have bladdery empalements, which terminate in two teeth. When these lie on the ground, their globular heads, having a little blush of red on their upper side toward the sun, and the other part being white, have a great resemblance of Strawberries, and from thence it was titled Strawberry Trefoil.

These sorts are preserved in botanick gardens for variety; they are easily propagated by seeds, which may be sown on an open bed of ground, either in autumn or spring. The plants which come up in autumn, will grow much larger, and flower earlier in the summer than those which are sown in the spring, so from those good seeds may be always obtained, whereas the other sometimes miscarry. When the plants come up, they require no other care than to keep them clean from weeds, and thin them where they are too close.

The eleventh sort is the common Melilot, which is used in medicine; it grows naturally among the Corn in many parts of *England*, particularly in *Cambridgeshire* in great plenty, where it is a most troublesome weed; for in reaping it is scarce possible to separate it from the Melilot, so that it is carried in with the Corn; and the seeds of the Melilot being ripe about the same time with the Corn, they are threshed out with it, and being heavy are difficult to separate from it; and when a few of the seeds are ground with the Corn, it spoils the flour, for the bread, or whatever else is made with it, will have a strong taste like Melilot plaster.

The roots of this plant are strong and ligneous, from which spring out several stalks, which rise from two to four feet high, according to the goodness of the land. The stalks branch out, and are garnished with trifoliate leaves, having oval sawed lobes, of a deep green colour. The flowers are produced in long slender spikes, which spring from the wings of the stalks; they are of a bright yellow, and shaped like the other butterfly flowers; these are succeeded by naked seeds.

The twelfth sort grows naturally in *Bohemia* and *Austria*, but has been long cultivated in *England* as a medicinal plant, though at present it is rarely used; it is annual. The stalks are large, hollow, and channelled; they rise about a foot high, garnished with trifoliate leaves, whose lobes are oval, and slightly sawed on their edges, standing upon pretty long foot-stalks. The flowers are collected in oblong spikes, which stand upon very long foot-stalks, springing from the wings of the stalk at every joint; they are of a pale blue colour, shaped like those of the common Melilot; these appear in *June* and *July*, and are succeeded by small yellow seeds, of a kidney shape, two or three being included in each short pod. The whole plant has a very strong scent like that of Fenugreek, and perishes soon after the seeds are ripe.

If the seeds of these two sorts are permitted to scatter, the plants will rise without care, and require no other culture, but to keep them clean from weeds, and thin them where they grow too close.

TRIGONELLA. *Lin. Gen. Plant.* 804. Fenugreek.

The Characters are,

The empalement of the flower is bell shaped, of one leaf, cut at the top into five almost equal segments. The flower is of the butterfly kind; the standard is oval, obtuse, and reflexed; the two wings are oblong, reflexed, and spreading flat like the standard, so as outwards to appear like a regular flower of three petals; the keel is very short, obtuse, and occupies the navel of the flower. It has ten short rising stamina, nine of which are joined, and one stands separate, terminated by single summits, and an oval oblong germen, supporting a single style, crowned by a rising stigma. The germen afterward turns to an oblong oval pod compressed, filled with kidney-shaped seeds.

The Species are,

1. TRIGONELLA *leguminibus sessilibus strictis erectiusculis subfalcatis acuminatis.* *Hort. Cliff.* 229. Trigonella with sickle-shaped acute-pointed pods, which are close, erect, and sit close to the stalks; or common Fenugreek.

2. TRIGONELLA *leguminibus pedunculatis congestis erectis parallelis linearibus.* *Lin. Sp. Plant.* 777. Trigonella with linear, erect, parallel pods growing in clusters, having foot-stalks; or wild Fenugreek.

3. TRIGONELLA *leguminibus sessilibus arcuatis confertis, caulibus procumbentibus.* Trigonella with arched pods growing in clusters, sitting close to the stalks, which trail on the ground.

4. TRIGONELLA *leguminibus pedunculatis congestis pendulis ovalibus compressis, caule diffuso, foliolis subrotundis.* *Hort. Cliff.* 229. Trigonella with clustered, oval, compressed, hanging pods, having foot-stalks, diffused stalks, and roundish lobes.

5. TRIGONELLA *leguminibus pedunculatis congestis pendulis linearibus rectis, foliolis sublanceolatis.* *Lin. Sp. Plant.* 776. Trigonella with linear straight pods, which hang down in clusters upon foot-stalks, and spear-shaped lobes to the leaves.

6. TRIGONELLA *leguminibus pedunculatis congestis declinatis subfalcatis compressis, pedunculo communi spinoso foliis longiore.* *Lin. Sp. Plant.* 777. Trigonella with sickle-shaped, compressed, and clustered pods growing upon foot-stalks, and a common spiny foot-stalk longer than the leaves; or greater wild Fenugreek of *Crete*.

The first sort is the common Fenugreek, whose seeds are used in medicine. Where this plant grows naturally is uncertain, but it is cultivated in the fields, in the south of *France*, and in *Germany*, from whence great quantities of the seeds are annually imported here for use. It is also much cultivated in *India*.

It is an annual plant, which rises with a hollow, branching, herbaceous stalk a foot and a half high, garnished with trifoliate leaves, placed alternately, whose lobes are oblong, oval, indented on their edges, and have broad furrowed foot-stalks. The flowers come out singly at each joint from the wings of the stalk; they are white, of the butterfly kind, and sit very close to the stalk; these are succeeded by long compressed pods, shaped somewhat like a broad sword, ending in long points, having a broad membrane on one edge, filled with square yellow seeds, indented on one side like a kidney. The whole plant has a very strong odour.

This plant has not as yet been cultivated in any quantity for use in *England*, as it has generally proved a very uncertain crop, occasioned by the inconstancy of the weather here, for in cold wet seasons the plants are frequently killed before the seeds ripen; and if any of them live long enough to perfect their seeds, the pods change of a dirty colour, and the seeds turn black and unsightly, especially when much rain falls about the time of their ripening; therefore the seeds, which are imported from the continent, are always preferred to those of our own growth.

But as the consumption of these seeds is very great in *England*, there are some persons who are inclinable to make fresh trials to cultivate the plants here. As I have many years cultivated this in small quantities, and have made trials by sowing the seeds at different seasons, and after various manners, by which I have acquired a knowledge of its culture, so I shall here give such directions for the management of this plant, as from experience has been found to succeed best.

The ground in which this plant thrives best, is a light hazel loam, not enriched with dung; this should be cleaned from the roots of weeds, and well ploughed twice, and harrowed fine before the seeds are sown. The best time to sow the seeds is in the beginning of *September*, in shallow drills like Peas. The rows should be two feet asunder, and the seeds must be scattered one inch distant from each other in the drills; for if the plants are too close together in the spring, they may be easily thinned with the hoe, when the ground is cleaned. When the seeds are sown at the before mentioned time, the plants will appear in three weeks or a month after; and if the weeds appear at the same time, the ground should be hoed over as soon as possible in dry weather, to destroy the weeds; and when the plants are grown an inch high, the earth should be drawn up to their stems, in the same manner as is practised for Peas. This will secure their stems from being injured by sharp cutting winds; and if a ridge of earth is drawn up on the north or east side of each row, it will protect the plants from the pinching winds which blow from both those quarters; for although this plant will not be in any danger from the frost in the ordinary winters, yet in very severe frosts they are sometimes killed; but, as this plant will live in any situation, where Peas will stand through the winter, there will be no greater hazard of the one crop than the other.

In the spring of the year the ground must be hoed again in dry weather to kill the weeds, and the plants should be again earthed up in the like manner as Peas, with whose culture this plant will thrive; but there must be great care taken to keep the ground as clean from weeds as possible, for if they are permitted to grow, they will soon advance above the plants, and greatly weaken them; and when their

Pods begin to form, they cannot be too much exposed to the sun and air, whereby they will be less liable to suffer from moisture.

When the seeds are sown in autumn, the plants will grow much stronger, and have many more side branches than those which come up in the spring, so will produce a much greater crop of seeds; and these will produce their flowers five or six weeks earlier, so will have a better season to ripen; but in order to have them better ripened, the top of the plants should be cut off with garden-shears about the middle of *June*, by which time the pods will be formed on the lower part of the stalks, which will be greatly forwarded by topping of the stalks in the same way as is commonly practised for Garden-beans; for where the plants are suffered to extend in length, the lower pods often miscarry, or are less nourished, and those on the top of the stalks are late before they ripen; so where the topping of the plants is omitted, the pods at bottom will open and cast out their seeds, before those above will be ripe; therefore to preserve the first and cut off the other, will be found the best method, for by so doing the pods will ripen equally, and much earlier in the season.

If the summer proves warm, the seeds will ripen in *August*, and the plants should then be cut off, and laid to dry for five or six days, in which time they should be turned two or three times, that the pods may dry equally; then the seeds may be either threshed out in the field, or the haulm may be housed in a barn, to be threshed in a more convenient time.

The second sort grows naturally in *Spain* and *Sicily*. The stalks of this are slender, and rise near a foot high, sending out two or three slender branches, garnished with trifoliate leaves, whose lobes are wedge-shaped, sawed at their ends where they are indented; these stand upon long slender foot-stalks. The flowers are produced in clusters at the end of the branches, upon short foot-stalks, which stand erect; they are small, of a pale colour, and are succeeded by narrow pods, standing parallel and erect. This is an annual plant, which flowers in *July*. The seeds ripen the end of *August*, and the plants decay soon after.

The third sort grows naturally in *Spain* and *Italy*; this is also an annual plant, whose root decays soon after the seeds are ripe. The stalks trail upon the ground, and extend a foot and a half in length, sending out several side branches, garnished with small trifoliate leaves, whose lobes are wedge-shaped, and sawed at their points. The flowers are produced in clusters at the wings of the stalk; they are small, of a pale yellow colour, and sit very close to the stalks; these are succeeded by short hooked pods, which sit close to the stalks in clusters. It flowers in *July*, and the seeds ripen in autumn.

The fourth sort grows naturally in *Siberia*. The root of this is biennial; the stalks trail upon the ground, extend a foot in length, and send out many side branches, garnished with trifoliate leaves, having roundish lobes, which are sawed on their edges. The flowers come out from the wings of the stalks upon foot-stalks, growing in clusters; they are small, of a yellowish white colour, and are succeeded by oval compressed pods, containing two seeds in each.

The fifth sort grows naturally in *Siberia*; this is also a biennial plant, whose roots decay soon after the seeds are ripe. The stalks of this are very slender, and trail upon the ground; they extend a foot and a half in length, and divide into several branches. The leaves are trifoliate; the lobes are wedge shaped, indented at the point, sawed, and are narrower than either of the former. The flowers are small, yellow, and are produced in clusters, upon slender foot-stalks, which spring from the wings of the stalk, and are succeeded by narrow erect pods, which contain three or four small seeds.

The sixth sort grows naturally in *Crete*; this is an annual plant, whose stalks are slender, herbaceous, declining, extending a foot in length, and divide into many branches, garnished with trifoliate leaves, whose lobes are small, heart-shaped, and sawed at their tops, standing upon short foot-stalks. The flowers are small, of a pale yellow colour, and stand upon short foot-stalks, which spring from the wings of the stalk; these are succeeded by fickle-shaped compressed pods, which decline, and contain several oblong small seeds.

These plants are frequently cultivated in botanick gardens for variety, but I do not know any use is made of either of the sorts except the first. The seeds of these should be sown in the places where the plants are designed to stand, for they will not bear transplanting. If they are sown in autumn, in the same way as is before directed for the first sort, the plants will come earlier to flower, and good seeds may be obtained with more certainty than from the spring plants. All the culture these require is to thin them where they stand too close, and keep them clean from weeds. A few plants of each sort in a garden will be sufficient, as they have no great beauty.

TRILLIUM. *Lin. Gen. Plant.* 412. *American Herb Paris.*

The Characters are,

The flower has a three-leaved permanent empalement; it has three oval petals, which are a little larger than the empalement, and six awl-shaped stamina, which are erect, shorter than the petals, and terminated by oblong summits, with a roundish germen, having three slender recurved styles, crowned by single stigmas. The germen afterward becomes a roundish berry with three cells, filled with roundish seeds.

The Species are,

1. TRILLIUM *flore pedunculato cernuo.* *Lin. Sp. Plant.* 339. Trillium with a nodding flower growing upon a foot-stalk.
2. TRILLIUM *flore pedunculato erecto.* *Lin. Sp. Plant.* 340. Trillium with a flower growing erect upon a foot-stalk.
3. TRILLIUM *flore sessili erecto.* *Lin. Sp. Plant.* 340. Trillium with an erect flower having no foot-stalk.

These plants grow naturally in the woods in many parts of *North America*; the first was sent me from *Philadelphia* by Dr. *Bensel*, who found it growing in plenty there. The root of this plant is tuberous, sending out many fibres; the stalk is single, naked, and rises five or six inches high, with three oval smooth leaves, placed at the top upon short foot-stalks, which spread out in a triangle, of a deep green colour. From the center of the foot-stalks of the three leaves comes out one flower upon a short foot-stalk, which nods downward; this has a three-leaved green empalement spreading open, and within are three petals about the size of the empalement, of a whitish green on their outside, and purple within, having six stamina in the center, surrounding the style, which have oblong summits. The flowers of this appear in *April*, and are succeeded by roundish succulent berries, having three cells, filled with roundish seeds, which ripen in *June*.

The second sort has a taller stalk than the first. The three leaves are placed at a distance from the flower, which stands upon a long foot-stalk, and is erect; the petals of the flower are larger, and end with sharper points than those of the first.

The third sort grows in shady thickets in *Carolina*. The stalk of this is purple; the three leaves grow at the top like the first, but they are much longer, and end in acute points; the petals of the flowers are long, narrow, and stand erect.

These plants are propagated by seeds, which should be sown upon a shady border soon after they are ripe; and when the young plants come up the following spring, they

must be kept clean from weeds; and in autumn, after their leaves decay, the roots may be transplanted to a moist shady place, where they are to remain; if the seeds are sown in the spring, they will not vegetate till the next year.

TRIOSTEUM. *Lin. Gen. Plant.* 211. *Dr. Tinkar's Weed, or false Ipecacuana.*

The Characters are,

The flower has a permanent empalement of one leaf, cut into five segments; it has a tubulous flower of one petal, with a short brim, cut into five parts which stand erect, and five slender stamina the length of the tube, terminated by oblong summits, with a roundish germen, supporting a cylindrical style, crowned by a thick stigma. The germen afterward becomes an oval berry with three cells, each including one hard, three-cornered, obtuse seed.

The Species are,

1. **TRIOSTEUM floribus verticillatis sessilibus.** *Lin. Sp. Plant.* 176. *Trioosteum* with flowers growing in whorls, sitting close to the stalks; commonly called *Dr. Tinkar's Weed, or false Ipecacuana.*

2. **TRIOSTEUM floribus oppositis pedunculatis.** *Lin. Sp. Plant.* 175. *Trioosteum* with flowers growing opposite upon foot-stalks.

The first sort grows naturally in the woods in several parts of *North America*; the root is composed of thick fleshy fibres, which are contorted and rough, from which spring several strong herbaceous stalks a foot and a half high, garnished at each joint by two oblong broad leaves, sitting close to the stalk. From the bosoms of these come out the flowers in whorls, sitting very close to the stalks; the empalements are cut into five segments. The flowers are small, tubulous, of a dark red colour, and cut slightly at the brim into five obtuse segments, and are succeeded by roundish berries, which turn yellow when ripe, having three cells, in each of which is contained one hard seed. The root is perennial, but the stalks decay every autumn.

The second sort differs from the first in its leaves, being longer and narrower. The flowers stand single upon short foot stalks, but two at each joint, whereas the other has many growing in whorls round the stalks, but the roots of both are indifferently used in *America* by the title of *Dr. Tinkar's Weed.*

Both these plants are natives of *Virginia*, and some other northern parts of *America*, where their roots have been frequently used as an emetick, and are commonly called *Ipecacuana.* One of the first persons who brought the roots into use was *Dr. Tinkar*, from whence many of the inhabitants have called them by the name of *Dr. Tinkar's Weed.* The leaves of the first sort greatly resemble those of the true *Ipecacuana*, but the roots are of a different form; but so far as I can judge by the imperfect fruit of a specimen in my collection of the true *Ipecacuana*, as also by the figure and description given by *Piso* in his history of *Brasil*, it seems to belong to this genus.

The first grows on low marshy grounds, near *Boston* in *New England*, very plentifully, where the roots are taken up every year, and are continued in use amongst the inhabitants of *Boston.*

This plant is preserved in several curious gardens in *England*, and is hardy enough to thrive in the open air; but it should be planted on a moist light soil, for if it is on a dry ground, there must be care taken to water the plants constantly in dry weather, otherwise they will not thrive. It may be propagated by seeds, which should be sown in autumn on a border of light earth, exposed to the morning sun, for if the seeds are sown in the spring, they will remain in the ground a whole year before the plants will come up, so that during this time the border must be constantly kept clear from weeds; the following spring, when

the plants appear, they should be duly watered in dry weather, which will greatly promote their growth; but if the seeds are sown in autumn, the plants will come up the following spring, and must be constantly kept clear from weeds, which, if permitted to grow amongst them, will soon overbear the plants while they are young, and either quite destroy them, or so much weaken them, that they will not recover in a long time.

The plants may remain in this seed border until the *Michaelmas* following, when they should be carefully taken up, and transplanted where they are designed to remain. Some of them should be planted in pots, that they may be sheltered in winter, lest those which are in the full ground should be destroyed by severe frost.

They may be also propagated by parting of the roots. The best season for this work is in the spring, just before the plants begin to shoot, which is commonly about the middle or latter end of *March*; but in doing of this, the roots must not be parted too small, for that will prevent their flowering strong.

These plants perfect their seeds in this country every year, if sown in autumn as soon as they are ripe, which is the best way to propagate them. The seedling plants will not flower until the third year, and then they are seldom so strong as the older plants.

TRIPOLIUM. See *Aster.*

TRITICUM. *Tourn. Inst. R. H.* 512. *tab.* 292, 293. *Wheat.*

The Characters are,

It has an oval chaffy empalement with two valves, which inclose two or three flowers. The petals have a double valve as large as the empalement; the outer valve is bellied and acute-pointed; the inner is plain. The flowers have three hair-like stamina, terminated by oblong forked summits, and a top-shaped germen, supporting two hairy reflexed styles, crowned by feathered stigmas. The germen afterward becomes an oblong oval seed, obtuse at both ends, convex on one side, and channelled on the other, wrapped up in the petal of the flower.

The Species are,

1. **TRITICUM glumis ventricosis lewibus imbricatis submuticis.** *Hort. Upsal.* 21. *Wheat* without beards, and smooth, bellied, imbricated husks; or common *Wheat.*

2. **TRITICUM glumis ventricosis glabris imbricatis aristatis.** *Hort. Upsal.* 21. *Bearded Wheat* with smooth, imbricated, bellied husks; or *Spring Wheat.*

3. **TRITICUM glumis ventricosis villosis imbricatis obtusis.** *Hort. Upsal.* 21. *Wheat* with hairy, bellied, imbricated, obtuse husks; or *four-cornered Wheat*, with short, hairy, turgid spikes, commonly called *gray Pollard* or *Duckbill Wheat.*

4. **TRITICUM glumis ventricosis villosis imbricatis, spicis oblongis pyramidatis.** *Wheat* with hairy, bellied, imbricated husks, and oblong pyramidal spikes; commonly called *Cone Wheat.*

There are some other varieties of *Wheat*, which the farmers in different parts of *England* distinguish by different titles; but they are only seminal variations, which have risen from culture. Some of these differ in the colour of their chaff, and others in the form of their spikes; but as they are subject to vary, we shall not enumerate them as different species. The varieties are, the red *Wheat* without awns, the red-eared bearded *Wheat*, *Poland Wheat*, many-eared *Wheat*, and naked *Barley.* But the four sorts above enumerated, I have sown several years, and have always found them constant without variation.

Where *Wheat* grows naturally, is very hard to determine at present; but it is generally supposed that *Africa* is the country, because in the earliest accounts we have of it, there is mention of its being transported from thence to other

other countries, and *Sicily* was the first country in *Europe* where this grain was cultivated; but although the country of its natural growth is in a very warm climate, yet it is found to bear the inclemency of rough climates very well; and in countries more north than *England*, where the summers are long enough to ripen the grain, it is found to succeed.

The first sort is the common Wheat, which is sown in most parts of *England*, and is so well known as to need no description. The spikes or ears of this are long; the grains are ranged in four rows, and lie over each other like the scales of fish; the chaff is smooth, bellied, and is not terminated by awns or beards.

The second sort is called Summer or Spring Wheat; this will ripen much earlier than the other, so has often been sown in the spring of the year, at the same time with Oats; but if the season proves wet, it is very subject to grow tall, and have very thin grains, which has discouraged people from sowing it at that season; so that unless from the severity of the winter, or some other accident, the winter Corn is injured, the sowing Wheat in the spring is rarely practised.

The third sort is called in some places gray Wheat, in others Duckbill Wheat and gray Pollard; but in *Suffex* it is generally known by the title of Fullers Wheat. This sort grows very tall, and if it is sown too thick, is very apt to lodge with rain and wind, for the ears are large and heavy; they nod on one side as the grain increases in weight. The awns are long; the chaff hairy, which detains the moisture, all which help to lodge it; for which reason many people do not choose to cultivate this sort; but where the roots are at a proper distance from each other, they will put out many stalks from each; the stalks will be stronger, support themselves better, and the grain produces more flour in proportion than any of the other sorts. The awns of this sort frequently drop off when the grain is full grown.

The fourth sort is more cultivated in *Oxfordshire* and *Berkshire* than in any other part of *England*. The ears of this sort are formed like a cone, ending with a slender point, from whence it had the title of Cone Wheat. Of this there are the white and red, which I believe are only varieties, for I have generally seen them mixed in the field. The awns of this are long and rough, so the farmers say it guards the grain from birds, which has been a recommendation to sow it, especially near inclosures, where there is shelter for birds. Mr. *Tull* prefers this sort for sowing in drills, but I have seen the third sort answer much better in the horse-hoeing husbandry.

The season for sowing of Wheat is autumn, and always when the ground is moist. In the downs of *Hampshire*, *Wiltshire*, and *Dorsetshire*, the farmers begin sowing of their Wheat in *August*, if there happens rain; so that when they are in their harvest, if the weather stops them, they employ their people in sowing; for if the Corn is not forward in autumn, so as to cover the ground before winter, it seldom succeeds well on those dry lands, especially if the spring should prove dry; but in the low strong lands, if they get their Wheat into the ground by the middle of *November*, the farmers think they are in good season; but sometimes it so happens, from the badness of the season, that in many places the Wheat is not sown till *Christmas* or after; but this late-sown Wheat is subject to run too much to straw, especially if the spring should prove moist.

The usual allowance of Seed-wheat to one acre of land, is three bushels; but from repeated experiments it has been found, that half that quantity is sufficient; therefore, if the farmers have regard to their own interest, they should save this expence of seed, which amounts to a considerable article in large farms, especially when it is to be purchased,

which most of the skilful farmers do, at least every other year, by way of change; for they find that the seeds continued long upon the same land, will not succeed so well as when they procure a change of seeds from a distant country. And the same is practised by the husbandmen of the *Low-Countries*, who commonly procure fresh seeds from *Sicily* every second or third year, which they find succeed better with them than the seeds of their own country. In the choice of the seeds, particular regard should be had to the land upon which it grew, for if it is light land, the Wheat which grew upon strong land is the best, and so *vice versa*.

There have been some persons in *England* curious enough to procure their Seed-wheat from *Sicily*, which has succeeded very well; but the grain of this has proved too hard for our *English* mills to grind, which has occasioned their neglecting to procure their seeds from thence; nor do I think there can be much advantage in procuring the seeds from abroad, since the lands of *England* are so various as to afford as much change of seeds as will be necessary. And the less we purchase from abroad, the greater will be the saving to the publick; so that it should be the business of skilful farmers to want as few seeds as possible, since, by exchange with each other, they may so contrive as not to part with ready money for any seeds.

The land which is usually allotted for Wheat, is laid fallow the summer before the Corn is sown; during which time it is ploughed two or three times, to bring it into a tilth; and the oftener and better the ground is ploughed, and the more it is laboured with harrows between each ploughing to break and divide the clods, the better will be the crop, and the fewer weeds will be produced. But in this article most of the farmers are deficient; for after they have given their lands one ploughing, they frequently leave it to produce weeds, which sometimes are permitted to stand until they shed their seeds, whereby the ground will be plentifully stocked with weeds; and as an excuse for this, they say that these weeds will supply their sheep with some feed, and the dung of the sheep will mend their land; but this is a very bad piece of husbandry, for the weeds will draw from the land more than the dung of the sheep will supply; so that it is undoubtedly the best method to keep the ground as clean from weeds as possible, and to stir it often to separate and break the clods, and render the land fine; and where the land can enjoy a winter's fallow, it will be of much greater service to it than the summer; by thus labouring of the land, it will be of equal service to it as a moderate dressing of dung. Therefore if the farmers could be prevailed on to alter their method of husbandry, they would find their advantage in it; for the expence of dressing in some countries is so great, as to take away the whole profit of the crop.

There is also a very absurd method in common practice with the farmers, which is the carrying of their dressing, and spreading it on the land in the summer, where it lies exposed till the sun has dried out all the goodness of it, before it is ploughed into the ground; so that the dressing is of little value; therefore the dung should never be laid on the land faster than it can be ploughed in, for one load of dung so managed, is better than three in their usual method.

As Wheat remains a longer time upon the ground than most other sorts of Corn, it requires a greater stock of nourishment to lengthen and fill the ears: therefore, if the dressing is exhausted in winter, the Corn will have but short ears, and those but lean, nor will the grain afford much flour; so that it frequently happens, that a light dressing of foot in the spring, at the time the Wheat is beginning to stalk, proves of greater service to the crop than

a dressing of dung laid on the land before it is ploughed, especially if the dung is not very good. Deep ploughing (where the staple of the ground will admit of it) is also of great service to the Corn; for the small fibres of the roots, which are the mouths that supply the nourishment, extend themselves very deep into the ground. I have traced many of them upward of three feet, and believe they spread much farther where the ground is light; therefore it is of great advantage to the crop to have the ground stirred and loosened to a proper depth; for by so doing the roots will find a supply of pasture for the nourishment and augmentation of the ears, at the time they are forming, when it is most required; for if the ground is ploughed shallow, the roots will have extended themselves to that depth by the spring; so that when the nourishment is wanted to supply the stalks, the roots are stunted by the hardness of the soil, which they cannot penetrate; when this is the case, the colour of the blade is frequently seen to change in *April*, and seldom recovers its verdure again; and when this happens, the stalks are always weakened in proportion to the decay of the blade; for it is well known from long experience, that the leaves or blade of Corn are necessary to draw in nourishment from the air and dews, for the increase of the stalk and ear; but in order to ascertain this, I have made trial of it, by cutting off the leaves of some roots of Wheat alternately, early in the spring, and have constantly found the stalks upon those roots much smaller, the ears shorter, and the grain thinner than those of the intermediate roots, whose blades were not cut. This shews the absurdity of that practice of feeding sheep upon Corn in the winter and spring. I have frequently seen in some gardens, plants divested of their lower leaves, which ignorant persons have supposed to draw away the nourishment from the head; but wherever this has been practised, I have always observed, that in proportion to the number of leaves cut off, the plants have been weakened by it; so that until those leaves decay naturally, they should never be taken off.

Of late years, many composts have been advertised for the steeping of the seeds of Corn, in order to improve their growth; some of these have been sold at a dear rate; but as so great success was assured by the inventors, to those who should make use of them, there were numbers of persons who made the trial; but so far as I have been able to get information of their experiments, they did not succeed so well as to encourage the use of these compositions; and from several trials which I made myself with great care, I always found, that the Wheat which had been steeped in these compositions came up sooner, and grew much ranker in the winter than that which had not been steeped; but in the spring the unsteeped Wheat had a greater number of stalks to each plant, and the ears were better fed than those which had been steeped; therefore these sorts of composts have been found of no real use to the crop.

My experiments were made in the following manner. The Wheat was sown in drills, on the same spot of ground; the seeds which had been steeped were sown in alternate rows, and the intermediate rows were sown with unsteeped Corn. The rows were a foot and a half asunder, and the grains were all taken out of one measure, and sown as equally as possible: the steeped Corn appeared above ground three days before the other, and continued to grow faster than the unsteeped Corn, during the winter; but in the spring, the blade of the steeped Corn changed its colour, and their points became brown; then I gave a light dressing one of the rows, which soon recovered its verdure, and caused it to be the strongest row of the whole; but the others which had not this dressing, produced weaker stalks and ears than that which was not steeped.

I have before observed, that in general the farmers sow

more than double the quantity of Corn on their lands than is necessary; therefore there is a great waste of grain, which in scarce years amounts to a considerable sum in large farms, and to a whole country it is an object worthy the attention of the publick; but I fear whatever may be said to prevent this, will have but little weight with the practitioners of agriculture, who are so fond of old customs, as rarely to be prevailed upon to alter them, though they are extremely absurd. But if these people could be prevailed on to make the trial with care, they must be soon convinced of their error; for if they will but examine a field of Corn sown in the common way, they will find but few roots which have more than two or three stalks, unless by chance, where there may be some few roots which have room to spread, upon which there may be six, eight, or ten stalks, and frequently many more; but I have seen a field of Wheat which had not a greater allowance than one bushel of Corn to an acre, so that the roots had room to spread, produce from six to twelve or fourteen stalks, which were strong, and had long well-nourished ears; and the produce of flour was much greater than in any of those fields in the neighbourhood, which were sown with the common allowance. Where the land is good, and the roots stand at a proper distance from each other, there will be few roots which will not produce as many stalks as I have here mentioned, and the ears will be better nourished.

But if the land is not covered with the blades of Corn by the spring, the farmers think they shall have no crop; whereas, if they would have patience to wait till the roots put out their stems, they would soon be convinced of the contrary, especially if they could be prevailed on to draw a weighty roller over the Wheat in *March*, which will cause it to spread; and by settling of the loose ground to the roots, the drying winds in the spring would be prevented from penetrating to their fibres, so will produce the more stalk; but before this operation, it will be proper to have the Corn cleaned from weeds, for if these are permitted to grow, they will draw away much nourishment from it; and if, at this season, the land is made clean from weeds, the Corn will soon after spread, and cover the ground, whereby the growth of weeds will be greatly lessened.

There is not any part of husbandry which requires the farmer's attention more than that of keeping his land clean from weeds; and yet there are few who trouble themselves about it, or who understand the proper method of doing it; few of them know those weeds which are annual, so as to distinguish them from those which are perennial; and without this knowledge, it will be much more difficult for a person to clean his land, let his industry be ever so great, for annual weeds may be soon destroyed, if taken in time; whereas, if they are neglected, their seeds will soon ripen and scatter; after which it will require three times the labour and expence to get rid of them, as would have been sufficient at the beginning; and then the crop would have had no bad neighbours to rob it of its nourishment. The common method now practised is a very absurd one, for the weeds are left to grow till the Wheat is beginning to ear, by which time many of the weeds are in flower, and some will have ripened seeds. Beside the ground being covered by the Corn, all the low weeds are hid, and these are left to ripen and scatter their seeds; the tall weeds only are taken out, and if the people employed are not careful, many of these will escape them, as they will be so intermixed with the stalks of Wheat, as not to appear, unless diligently sought after. By this method the weeds are permitted to stand, and rob the Corn of its nourishment, during the principal time of its growth, and the humble weeds are never destroyed; and by going amongst the stalks when they are tall, great numbers of them are broken and trod under

under the work-peoples feet; yet however obvious this is to every farmer, none of them have thought of altering this practice. I would therefore recommend a method which is now in common practice among the kitchen-gardeners, which has been found of great benefit to their crops, and has also been a great saving to them in the expence of weeding, which is making use of the small kind of hoes for cleaning the Wheat early in the spring, before the ground is covered with the blades of Corn. With this instrument, all the low as well as the tall weeds will be cut up, and if it is performed in dry weather, the weeds being then small will soon die. Where the ground happens to be very full of weeds, it may be necessary to go over it a second time, at about three weeks after the first, to cut up any weeds which may have before escaped. By laying the ground clean at this time, the Corn will not be robbed of its nourishment; and there will not be time for the weeds to grow so as to prejudice it much after, for the ground will be so much shaded by the Corn, as to keep down the weeds, so that they cannot have time to ripen their seeds before harvest.

If, at the time of this operation, the roots of Corn are cut up where they are too close, it will be found of great service to the other; but this, I fear, few of the old farmers will ever agree with me in, though what I mention is not from theory but experiments, which have been repeated with great care; and where it was practised, the produce of twenty rods of ground was much greater both in weight and measure than the same quantity of ground in the best part of the field, where this was not practised, and the stalks stood upright, when a great part of the Corn in the same field was lodged.

I have often observed in those fields where foot-paths are made through the Corn, that by the side of those paths where the Corn is thin, and has been trodden down in the winter and spring, the stalks have stood erect, when most of the Corn in the same field has been laid flat on the ground, which was owing to the stalks being so much stronger from their having more room; the other having been drawn up tall and slender by being so close. There is also another great advantage in keeping Corn clean from weeds, and giving it room to spread, which is, that the Corn is not so liable to take the smut as when it is full of weeds, and the roots too much crowded, this I have frequently observed; so that cleanness and free air is as essential to the growth of vegetables as animals, and the changing of the seed annually is also as necessary as the change of air is to all sorts of animals; for where this has been carefully practised, there has rarely happened any smutty Corn in the field.

Brining of the Seed-wheat is what the farmers generally practise to prevent the smut, which in most years answers very well; but there is nothing which contributes more to this than keeping the plants in good health, which is better effected by the method before proposed, for by stirring of the ground with the hoe between the roots of Corn in the spring, they will be better supplied with nourishment; for in strong lands, where the water may have lain in the winter, the surface of the ground will bind so hard on the first dry weather, as to stint the Corn, and frequently cause it to change colour. When this happens, the roots seldom put out many stalks, and those which are put out are weak; but where the surface of the ground can be stirred to loosen the parts, the Corn will soon recover its colour and strength, and cover the land with shoots.

What has been here directed, must be understood to relate to Wheat sown in broad-cast, which is the usual method practised by farmers in every part of *England*; for the horse-hoeing husbandry, which was practised by Mr. *Tull*, has been almost universally rejected by the farmers in every country, it being so opposite to their accustomed practice,

that few of them can be prevailed upon to make trial of it; and indeed, by the absurdity of the author in a few particulars, he has discouraged many from engaging in it, who would otherwise have practised it; but upon finding Mr. *Tull* positively asserting, that the same land would nourish the same species of plants without changing the crops for ever, and this without manure, which being contrary to all experience, led them to believe his other principles had no better foundation. And he practised this method of sowing the same species upon the same ground till his crops failed, and were much worse than those of his neighbours, who continued their old method of husbandry; and hereby his horse-hoeing husbandry was ridiculed by them, and laid aside by gentlemen who were engaging in it. But notwithstanding those and some other particulars which have been advanced by Mr. *Tull*, yet it is much to be wished that this new husbandry might be universally practised; for some few persons who have made sufficient trial of it, have found their crops answer much better than in the common or old method of husbandry; and the *French*, who have learned it from Mr. *Tull*'s book, are engaging in the practice of it with greater ardour than those of our own country; and although they had not the proper instruments of agriculture for the performance, and met with as strong opposition from the persons employed to execute the business, as in *England*, yet the gentlemen seem determined to persist in the practice of it; though, as yet, few of their experiments have had the success they hoped for, partly from the awkwardness of their labourers, and partly from their averseness to practise this husbandry, and also from their being made in lands not well conditioned; but yet their produce has been equal to that of the old husbandry, and they say, that if the produce of the land in the new method of husbandry, does not exceed that in the old way, yet by saving seven parts from eight of the Seed-corn, it is a great affair to a whole country, especially in times of scarcity.

As Mr. *Tull* has given full directions for the practice of this husbandry, I shall refer the reader to his book for instruction, and shall only mention two or three late experiments which have been made in his method, whereby the utility of it will more fully appear.

The first was in a field of Wheat, which was sown partly in broad-cast in the common method, and partly according to *Tull*'s method; the spots thus sown were not regular in lands, but interspersed indifferently in many directions. Those parts of the field in *Tull*'s method, were in rows at two feet distance, and stood thin in the rows. The roots of the Wheat in these spots had from ten to thirty stalks upon a root, and continued upright till it was reaped; whereas few of the roots in the common method had more than two or three stalks, and these were most of them lodged before harvest; so that upon trial of the grain when threshed, there was near a third part more in weight and measure, than from the same extent of ground, taken in the best part of the field sown in the common way.

Another trial was made in sowing of the Corn in rows at different distances, with some sown in two parts of the ground broad-cast. The event was, that all which was sown broad-cast in the usual way was lodged, as was also most of that where the rows were six or nine inches asunder; those which stood a foot distance escaped better, but the rows two feet asunder were the best, and the produce much greater than any of the other; which plainly shews the absurdity of that practice, in sowing a great quantity of seeds, to have a better produce, which is the opinion of most of the old farmers; and it was formerly the prevailing opinion among gardeners, who allowed near eight times the quantity of seeds for the same space of ground, as is now usually sown, and these crops are greatly superior to any of the se.

The produce of an acre of Wheat is various, according to the goodness of the soil. In some of the shallow, chalky, down lands, where there have been near four bushels of Corn sown, I have known the produce not more than double of the seed; but when this is the case, the farmer had much better let his land lie waste, since the produce will not defray the expence, so that more than the rent of the land is lost: and although these sort of crops are frequently seen on such land, yet such is the passion for ploughing among the husbandmen at present, that if they were not restrained by their landlords, they would introduce the plough into every field, notwithstanding they are sure to lose by it.

But although the produce of these poor downs is so small, as before related, yet upon good land, where the Corn has stood thin upon the ground, I have known eight and ten quarters reaped from an acre over the whole field, and sometimes much more. And I have been informed by persons of great credit, that on good land, which was drilled and managed with the horse-hoe, they have had twelve quarters from an acre of land, which is a great produce; and this is with greater certainty, if the season proves bad, than can be expected by the common husbandry.

The price of Corn varies continually, and this variation is often very great in the space of one or two years; so that from being so cheap, as that the farmers could not pay their rents in the compass of a year or two, the price has been more than doubled; for one or two plentiful harvests have lowered the price of Wheat so much, as to make it difficult for the needy farmer to go on with his business, who wants ready money for his crops as soon as he can prepare them for the market. This has established a set of people called dealers in Corn, who have taken the advantage of the farmer's necessity, and engrossed their Corn to keep it for better markets; and these dealers have of late years increased greatly in their numbers, to the great prejudice of the raisers and also the consumers of Corn, which may in time prove fatal to the country, by monopolizing the greatest part of the produce, and then set their own price upon it; so that between these Corn-factors, as they are called, and the distillers, the price of bread may be too great for the labouring poor, which is an affair that requires more publick attention than has yet been given to it.

The French have been, and are building publick granaries for the conservation of their Corn, in most of their provinces; for as in some years they have great plenty of Corn, and at other times as great scarcity, they are contriving to prevent any great want of it.

When the Wheat is sold much under four shillings the bushel, the farmer cannot pay his rent, and live; nor can the poorer sort of people afford to purchase good bread, when the Wheat is sold at a price much higher than six shillings the bushel; therefore when it is at a medium between these, there can be no great cause of complaint on either side.

TRIUMFETTA. Plum. Gen. Nov. 40. tab. 8.

The Characters are,

The flower has no empalement, but it has five linear, erect, obtuse petals, which turn inward; it has ten awl-shaped rising stamina the length of the petals, terminated by single summits, and a roundish germen, supporting a style the length of the stamina, crowned by an acute bifid stigma. The germen afterward becomes a globular capsule, set with long prickles on every side, having four cells, each containing one seed, which is convex on one side, and angular on the other.

The Species are,

1. TRIUMFETTA caule fruticoso, foliis tricuspидatis serratis, floribus axillaribus terminalibusque. Triumfetta with a shrubby

stalk, three-pointed sawed leaves, and flowers springing from the wings, and terminating the stalk.

2. TRIUMFETTA foliis oblongo-ovatis, obtuse serratis, petiolis longissimis. Icon. tab. 298. Triumfetta with oblong oval leaves bluntly sawed, having very long foot-stalks.

The first sort grows naturally in *Jamaica* and most of the other islands in the *West-Indies*; it rises with an upright stem to the height of six or seven feet, which becomes ligneous toward the bottom, dividing upward into four or five branches, garnished with leaves, placed alternately, divided almost into three lobes toward the top, ending in acute points; they are covered with a soft brown down on their under side, but their upper is of a yellowish green; their borders are acutely but unequally sawed, standing upon foot-stalks an inch long. The branches are terminated by long spikes of flowers, and from the side of the stalk come out several small clusters. The flowers are small, the petals narrow, of a yellow colour; these are succeeded by burry capsules, something like those of the Agrimony, but rounder; the prickles are longer than those, and are placed on every side. This plant generally flowers here in *July* and *August*, and in warm seasons the seeds do sometimes ripen.

The second sort grows naturally in *India*; it is an annual plant, rising near three feet high; the stalks are ligneous, branching out toward the top into three or four slender branches, garnished with entire leaves, sawed on their edges, ending in acute points, and are terminated by small clusters of pale yellow flowers, standing upon pretty long foot-stalks. The empalements of the flowers are cut into five narrow segments, but soon fall off; the flower has five erect petals, and generally ten slender stamina, terminated by roundish summits, with a roundish germen, supporting one hairy style, crowned by a single stigma. The germen afterward becomes a round prickly capsule with four or five cells, each including one seed.

These sorts are both propagated by seeds, which must be sown on a hot-bed early in the spring; and when the plants come up, and have four or five leaves, they should be each transplanted into a separate pot, and plunged into a moderate hot-bed of tanners bark, shading them from the sun until they have taken new root; then they must be treated in the same manner as hath been directed for other tender exotic plants. During the summer season the plants may remain in this hot-bed, but in autumn the first must be removed into the stove, and plunged into the bark-bed. If the plants live through the winter, they will flower the following summer, so will ripen their seeds in autumn; but they may be continued two years, provided they are carefully managed.

The second sort is annual; so, if the plants are brought forward early in summer, they will flower in autumn, but must be removed into a stove to perfect the seeds, which seldom ripen in *England* before *Christmas*.

TROLLIUS. Lin. Gen. Plant. 620. Globe Ranunculus, or Locker Gowls.

The Characters are,

The flower has no empalement; it has about fourteen oval petals, whose points meet together with nine nectariums, which are narrow, plain, incurved, and umbilicated, perforated at their base, and a great number of bristly stamina, terminated by erect summits, with numerous germina sitting close like a column, having no styles, but are crowned by pointed stigmas. The germen afterward become so many capsules, collected into an oval head, each containing one seed.

The Species are,

1. TROLLIUS corollis conniventibus, nectariis longitudine staminum. Lin. Sp. Plant. 556. Trollius with the petals of the flower meeting, and nectarii the length of the stamina;

stamina; commonly called Globe Flower, or Locker Gowls.

2. *TROLLIUS corollis patentibus nectariis longitudine petalorum. Lin. Sp. Plant. 557.* Trollius with an open spreading flower, and nectariums the length of the petals.

The first sort grows naturally in the northern counties in England, and in many parts of Wales. I found it in great plenty growing in the park of Burrow-Hall, in Lancashire; it has a perennial, fibrous, black root, from which spring up many leaves, which resemble those of Wolfsbane, cut into five segments almost to the bottom; the stalk rises near two feet high; it is smooth, hollow, and branches toward the top; each branch is terminated by one large yellow flower, shaped like those of Crow-foot, which has no empalement, composed of several concave petals, whose points turn inward toward each other, covering the parts of generation, so are of a globular form; whence it had the title of Globe Ranunculus. It flowers the latter end of May and the beginning of June, and the seeds ripen in August. This plant is frequently kept in gardens about London, and is easily propagated by parting of the roots; the best time for doing this is the latter end of September, when the leaves are beginning to decay. The roots should not be divided into small parts, if they are expected to flower strong the following year, and should be planted at a foot distance from each other; it requires a shady situation and a moist soil. The roots need not be removed or parted oftener than once in three years, unless there is a desire of increasing them.

The second sort grows naturally in Siberia, from whence it was brought to the imperial garden at Petersburg, and has been communicated since to several parts of Europe; this differs from the first in having larger leaves, which are of a lighter green colour; their segments are fewer and larger, resembling those of the yellow Monks Hood. The petals of the flower spread open, and do not converge at their points like those of the first sort. The flowers, stamina, and nectariums are of an elegant Saffron colour. It flowers in May.

This sort may be propagated and treated in the same way as the first, but it requires a moister soil, and should have a shady situation, but not under the drip of trees; it thrives best on a north border where the soil is loamy, but not too stiff. In such situations the plants will produce seeds in England, but if they are in a dry soil, or much exposed to the sun, they frequently die in summer. I have seen this sort in the most flourishing state, where the surface of the ground was covered with moss to keep it moist.

As the flowers of both these plants make a pretty appearance during their continuance, they deserve a place in every good garden for the sake of variety, especially as they will thrive in moist shady places where few better plants will live; and by thus suiting the plants to the different soils and situations of a garden, every part may be furnished with beauties, and a great variety may be preserved.

TROPÆOLUM. Lin. Gen. Plant. 421. Indian Cress.

The Characters are,

The empalement of the flower is of one leaf, ending in five points; it is erect, spreading, and falls off. The two under segments are narrow; their tail ends in a nectarious horn, which is longer than the empalement. The flower has five roundish petals inserted in the segments of the empalement; the two upper sit close to the foot stalk, but the lower have oblong hairy tails. It has eight short awl-shaped stamina, which decline, and are unequal, terminated by oblong rising summits, having four cells, and a roundish germen with three lobes, which are streaked, supporting a single erect style, crowned by an acute trifid stigma. The germen afterward becomes a solid fruit in three parts, convex on the outside, angular within, having many furrows, each part or

cell including one furrowed seed, convex on one side, and angular on the other.

The Species are,

1. *TROPÆOLUM foliis subquincelobis, petalis obtusis. Hort. Upsal. 93.* Tropæolum with leaves which are almost divided into five lobes, and obtuse petals to the flower; the common, or small Indian Cress.

2. *TROPÆOLUM foliis integris, petalis acuminato setaceis. Hort. Upsal. 93.* Tropæolum with entire leaves, and acute-pointed bristly petals to the flower; commonly called greater Indian Cress.

The first sort grows naturally in Peru; this was first brought to Europe in 1684, and was raised in the gardens of count Bevening in Holland.

It has a trailing herbaceous stalk, garnished with leaves almost circular. The foot-stalk is inserted in the center of the leaf, like a buckler, as in the Navelwort; they are smooth, of a grayish colour; the flowers come out from the wings of the stalks, standing upon very long slender foot-stalks, of an admirable structure, composed of five acute-pointed petals; the two upper are large and rounded; the three under are narrow; their tails join together, and are lengthened into a tail two inches long. After the flower is past, the germen turns to a roundish fruit, which is furrowed, and divided into three lobes, each including one streaked seed. It flowers from Midsummer till the frost stops it in autumn.

There are two varieties of this, one with a deep Orange-coloured flower, inclining to red, and the other with a pale yellow flower.

The second sort grows naturally about Lima; this has larger stalks than the former. The leaves are also larger, and their borders are indented almost into lobes; the flowers are larger, and their petals are rounded at their points. There are two colours of this sort as in the former, and one with double flowers, which is propagated by cuttings, for it does not produce seeds.

The first sort is less common at present in the English gardens than the second, though it was formerly more so; the flowers of the latter being larger make a finer appearance, for which it is preferred; they are both esteemed annual plants, though they may be continued through the winter if they are kept in pots, and sheltered in a good green-house, in like manner as that with double flowers is preserved, so may be propagated by cuttings as that is; but, as these ripen their seeds constantly every year, the plants are generally raised from them; these may be sown in April in the places where they are to remain, which should be where their stalks may have support, for they will climb six or eight feet high, when they are trained up, and then their flowers will make a good appearance; but when they trail upon the ground, they will spread over the neighbouring plants, and become unsightly.

The flowers of these plants are frequently eaten in salads; they have a warm taste like the Garden Cress, and are esteemed very wholesome; they are likewise used for garnishing dishes. The seeds are pickled, and by some are preferred to most kinds of pickles for sauce.

TUBEROSE. See Polyanthes.

TULIPA. Tourn. Inst. R. H. 373. tab. 199 & 200. Lin. Gen. Plant. 576. Tulip.

The Characters are,

The flower has no empalement; it is of the bell-shape, composed of six oblong, oval, concave, erect petals; it has six awl-shaped stamina, which are shorter than the petals, terminated by oblong four-cornered summits, and a large, oblong, taper, three-cornered germen, having no style, crowned by a triangular, three-lobed, permanent stigma. The germen afterward turns to a three-cornered capsule, having three cells, which are

filled with compressed seeds, lying over each other in a double order.

The Species are,

1. TULIPA flore subnutante, foliis lanceolatis. Lin. Sp. Plant. 305. Tulip with a nodding flower, and spear-shaped leaves; or the smaller, yellow, Italian Tulip.

2. TULIPA flore erecto, foliis ovato-lanceolatis. Lin. Sp. Plant. 306. Tulip with an erect flower, and oval spear-shaped leaves. This is the common Tulip with all its varieties.

The first sort was formerly preserved in the English gardens, but since there has been so many varieties of the second sort propagated in England, the first has been rejected, and is now only to be found in old neglected gardens. The petals of this flower end in acute points; the flower is yellow, and nods on one side, and the leaves are narrower than those of the common sort.

The common Tulip is so well known as to need no description; and it would be to little purpose to enumerate the several varieties of these flowers, which may be seen in one good garden, since there is no end of their numbers; and what some people may value at a considerable rate, others reject; beside there are annually a great variety of new flowers obtained from breeders, so those which are old, if they have not very good properties to recommend them, are thrown out and despised, I shall therefore point out the properties of a good Tulip, according to the characteristics of the best florists of the present age. 1. It should have a tall strong stem. 2. The flower should consist of six leaves, three within, and three without; the former ought to be larger than the latter. 3. Their bottom should be proportioned to their top, and their upper part should be rounded off, and not terminate in a point. 4. These leaves, when opened, should neither turn inward, nor bend outward, but rather stand erect, and the flower should be of a middling size, neither over large, nor too small. 5. The stripes should be small and regular, arising from the bottom of the flower, for if there are any remains of the former self-coloured bottom, the flower is in danger of losing its stripes again. The chives should not be yellow, but of a brown colour. When a flower has all these properties, it is esteemed a good one.

Tulips are generally divided into three classes, according to their seasons of flowering; as *Præcocas*, or early blowers, *Medias*, or middling blowers, and *Serotinas*, or late blowers; but there is no occasion for making any more distinctions than two, *viz.* early and late blowers.

The early-blowing Tulips are not near so fair, nor rise half so high, as the late ones, but are chiefly valued for appearing so early in the spring; some of which will flower the end of February in mild seasons, if planted in a warm border near a wall, pale, hedge, or other shelter, and a month after the others will succeed them; so that they keep flowering until the general season for the late flowers to blow, which is toward the end of April.

The roots of the early-blowing Tulips should be planted the beginning of September in a warm border, near a wall, pale, or hedge, because if they are put into an open spot of ground, their buds are in danger of suffering by morning frosts in the spring. The soil for these should be renewed every year, where people intend to have them fair. The best soil for this purpose is that which is taken from a light loamy pasture, with the turf rotted amongst it; and to this should be added a fourth part of sea sand. This mixture may be laid about eighteen inches deep, which will be sufficient, for these need not be planted more than four or five inches deep at most. The offsets should not be planted amongst the blowing roots, but in a border by themselves, where they may be planted pretty close together, especially

if they are small; but these should be taken up when their leaves decay, in the same manner as the blowing roots, otherwise they would rot; for these are not so hardy as the late blowers, nor do they increase half so fast as those, so that a greater care is required to preserve the offsets of them.

When these Tulips come up in the spring, the earth upon the surface of the borders should be gently stirred and cleared from weeds; and as the buds appear, if the season should prove severe, it will be of great service to cover them with mats, for want of which many times they are blighted, and their flower-buds decay before they blow, which is often injurious to the roots, as is also the cropping of the flowers, so soon as they are blown, because their roots, which are formed new every year, are not at that time arrived to their full magnitude, and are hereby deprived of proper nourishment.

If, when these flowers are blown, the season should prove very warm, it will be proper to shade them with mats, &c. in the heat of the day; as also if the nights are frosty, they should be in like manner covered, whereby they may be preserved a long time in beauty; but, when their flowers are decayed, and their seed-vessels begin to swell, they should be broken off just at the top of the stalks, because if they are permitted to seed, it will injure the roots.

When the leaves of these flowers are decayed (which will be before the late blowers are out of flower), their roots should be taken up, and spread upon mats in a shady place to dry; after which they should be cleared from their filth, and put up in a dry place, where vermin cannot come to them, until the season for planting them again, being very careful to preserve every sort separate, that you may know how to dispose of them at the time for planting them again, because it is the better way to plant all the roots of each sort together (and not to intermix them, as is commonly practised in most other kinds of flowers); for as there are few of them which blow at the same time, so, when the several roots of one sort are scattered through a whole border, they make but an indifferent appearance; whereas, when twenty or thirty roots of the same sort are placed together, they will all flower at the same time, and have a better effect.

There are many curious persons, who, in order to preserve their several kinds of Tulips, and other bulbous-rooted flowers separate, have large flat boxes made, which are divided into several small partitions, each of which is numbered in the same manner as the divisions of their beds; so that when a catalogue of their roots is made, and the numbers fixed to each sort in the beds, there is nothing more to do when the roots are taken up, but to put every kind into the division marked with the same number, which was placed to each sort in the bed, which saves a great deal of trouble, and effectually answers the purpose of preserving the kinds separate.

The late-blowing Tulips are so numerous, that, as I before observed, it would be to no purpose to attempt to give a catalogue of them. These are generally obtained from breeders, which is a term applied to all such flowers as are produced from seeds, which are of one self-colour, and have good bottoms and chives; these in time break into various beautiful stripes, according to the ground of their former self-colour; but this must be entirely thrown off, otherwise they do not esteem a flower well broken.

Of these breeders there hath been a great variety brought into England from Flanders of late years, which is the grand nursery for most sorts of bulbous-rooted flowers; but there are some curious persons, who have lately obtained many valuable breeders from seed in England; and doubtless, were we as industrious to sow the seeds of these flowers as the people of Holland and Flanders, we might in a few years have

as great variety as is to be found in any part of *Europe*; for, although it is six or seven years from the sowing before these flowers blow, yet, if after the first sowing there is every year a fresh parcel sown, when the seven years are expired, there will be constantly a succession of roots to flower every year, which will reward the expectation, and keep up the spirit of raising; but it is the length of time at first, which deters most people from this work.

The manner of propagating these flowers from seeds is as follows: You should be careful in the choice of the seed, without which there can be little success expected. The best seed is that which is saved from breeders which have all the good properties before related, for the seeds of striped flowers seldom produce any thing that is valuable.

The best method to obtain good seeds is to make choice of a parcel of such breeding Tulip roots as you would save seeds from, and plant them in a separate bed from the other breeders, in a part of the garden where they may be fully exposed to the sun, observing to plant them at least eight or nine inches deep; for if they are planted too shallow, their stems are apt to decay before their seed is perfected.

These flowers should always be exposed to the weather, for if they are shaded with mats, or any other covering, it will prevent their perfecting the seed. About the middle of *July* (a little sooner or later, as the summer is hotter or colder) the seeds will be fit to gather, which may be known by the driness of their stalks, and the opening of the seed-vessels; at which time it may be cut off, and preserved in the pods till the season for sowing it, being careful to put it up in a dry place, otherwise it will be subject to mould, which will render it good for little.

Having saved a parcel of good seed, about the beginning of *September* is the best season for sowing it, when there should be provided a parcel of shallow seed pans or boxes, six or eight inches deep, which should have holes in their bottoms to let the moisture pass off; these must be filled with fresh light earth, laying the surface very even, upon which the seeds should be sown as regularly as possible, that they may not lie upon each other; then there should be some of the same light earth sifted over them, about half an inch thick. These boxes or pans should be placed where they may have the morning sun till eleven of the clock, in which situation they may remain until the middle of *October*, at which time they should be removed into a more open situation, where they may enjoy the benefit of the sun all the day, and be sheltered from the north winds, where they should remain until winter, when they must be placed on a south border, to screen them from frost; but in the spring, when the plants are up, they should be again removed to their first situation; and if the season should be dry, they must be refreshed with water, while the plants remain green, but as soon as their tops begin to decay, there must be no more given them, lest it rot their tender bulbs; therefore the boxes should be placed in a shady situation during the summer season, but not under the drip of trees.

These plants, at their first appearance, have very narrow grassy leaves very like those of Onions, and come up with bending heads, in the same manner as they do; so that persons, who are unacquainted with them, may pull them up instead of Grass, whilst they are very young, before their leaves are a little more expanded; which is not performed the first year, for they seldom appear before the middle of *March*, and they commonly decay about the latter end of *May*, or the beginning of *June*, according as the season is hotter or colder.

The weeds and moss should also be cleared off from the surface of the earth in the boxes, and a little fresh earth sifted over them soon after their leaves decay, which will

be of great service to the roots. These boxes should be constantly kept clear from weeds, which, if permitted to grow therein, when they are pulled up, their roots will be apt to draw the bulbs out of the ground. At *Michaelmas* they should be fresh earthed again, and as the winter comes on, they must be again removed into the sun as before, and treated in the same manner, until the leaves decay, when the bulbs should be carefully taken up, and put in a cool shady room till the end of *August*, when they should be planted in beds of fresh sandy earth, which should have tiles laid under them, to prevent the roots from shooting downward, which they often do when there is nothing to stop them, and thereby they are destroyed. The earth of these beds should be about five inches thick upon the tiles, which will be sufficient for nourishing these roots while they are young.

The distance which these young bulbs should be allowed, need not be more than two inches, nor should they be planted above two inches deep; but toward the end of *October*, it will be proper to cover the bed over with a little tanners bark about two inches deep, which will preserve the roots from the frost, and prevent moss or weeds from growing over them; but, if the winter should be very severe, it will be proper to cover the bed either with mats or Peas haulm, to prevent the frost from entering the ground, because these roots are much tenderer while young, than they are after they have acquired strength.

In the spring the surface of the ground should be gently stirred to make it clean, before the plants come up; and if the spring should prove dry, they must be frequently refreshed with water, during the time of their growth; but this must not be given to them in great quantities, lest it rot their tender bulbs; and when the leaves are decayed, the roots should be taken up and treated in the same way as before.

When the bulbs are large enough to blow, they should be planted in fresh beds at the distance, and in the same manner as old roots, where, when they flower, such of them as are worthy to be preserved should be marked with sticks; and at the season for taking up the bulbs, they must be separated from the others, in order to be planted as breeders in different beds; but you should by no means throw out the rest until they have flowered two or three years, because it is impossible to judge exactly of their value in less time; for many, which at first flowering appear beautiful, will afterwards degenerate so as to be of little value, and others, which did not please at first, will many times improve, so that they should be preserved until their worth can be well judged of.

Having thus given an account of the method of raising these flowers from seeds, I shall now proceed to the management of the roots which are termed breeders, so as to have some of them every year break out into fine stripes.

There are some who pretend to have a secret how to make any sort of breeders break into stripes whenever they please; but this, I dare say, is without foundation; for from many experiments which I and others have made of this kind, I never could find any certainty in this. All that can be done by art is, to shift the roots every year into fresh earth of different mixtures and to different situations, by which method I have had very good success.

The earth of these beds should be every year different, for although it is generally agreed that lean, hungry, fresh earth doth hasten their breaking, and cause their stripes to be the finer and more beautiful, yet, if they are every year planted in the like soil, it will not have so much effect upon them, as if they were one year planted in one sort of earth, and the next year in a very different one, as I have several times experienced; and if some fine striped Tulips are planted

in the same beds with the breeders intermixing them together, it will also cause the breeders to break the sooner.

The best compost for these roots is a third part of fresh earth from a good pasture, which should have the sward rotted with it, a third part of sea sand, and the other part sifted lime rubbish; these should be all mixed together six or eight months at least before it is used, and should be frequently turned to mix the parts well together. With this mixture the beds should be made about two feet deep, after the following manner: After the old earth is taken from out of the bed to the depth intended, then some of the fresh earth should be put in about eighteen inches thick; this should be levelled exactly, and then lines drawn each way of the bed chequerwise, at six inches distance; upon the center of each cross, should be placed the Tulip roots, in an upright position; and after having finished the bed in this manner, the earth must be filled in, so as to raise the bed six or eight inches higher, observing, in doing this, not to displace any of the roots, and also to lay the top of the beds a little rounding, to throw off the wet.

There are many persons who are so careless in planting their Tulip roots, as only to dig and level the beds well, and then with a blunt dibble to make holes, into which they put the roots, and then fill up the holes with a rake; but this is by no means a good method; for the dibble, in making the holes, presses the earth closely on each side, and at the bottom, whereby the moisture is often detained so long about the roots as to rot them, especially if the soil is inclinable to bind; besides, the earth being hard at the bottom of the bulbs, they cannot so easily emit their fibres, which must certainly prejudice the roots.

These beds should be sunk, more or less, below the surface, according to the moisture or driness of the ground; for the roots should be so elevated as never to have the water stand near the reach of their fibres in winter, for moisture is very apt to rot them; so that where the soil is very wet, it will be proper to lay some lime rubbish under the earth, in order to drain off the wet, and the beds should be entirely raised above the level of the ground; but to prevent their falling down into the walks, after frost, or hard rains, it will be proper to raise the paths between them, either with sea-coal ashes or rubbish, eight or ten inches, which will support the earth of the beds; and these paths may slope at each end from the middle, which will make passage for the water to run off as it falls. But where the soil is dry, the beds may be sunk eighteen or twenty inches below the surface, for in such places the beds need not be more than four or six inches above the surface, which will be allowance enough for their settling.

During the winter season there will be no farther care required. The roots being planted thus deep, will be in no danger of suffering by ordinary frosts; but if the winter should prove very severe, some rotten tan or Peas haulm may be laid over the beds to keep out the frost during its continuance, but this must be removed when the frost is over; and in the spring, when their leaves begin to appear above ground, the earth upon the surface of the beds should be stirred to clear it from weeds, moss, &c. and when the flower-buds begin to come up, they should be guarded from frost, otherwise they are very subject to blight and decay soon after they appear, if the frost pinches their tops; but they need only be covered in such nights when there is a prospect of frost, for at all other times they should have as much open air as possible, without which they will draw up weak, and produce very small flowers.

When these breeders are in flower, you should carefully examine them to see if any of them have broken into beautiful stripes, which, if you observe, there should be a stick put into the ground by every such root, to mark them,

that they may be separated from the breeders, to plant amongst the striped flowers the following year; but you should carefully observe, whether they have thrown off their former colour entirely, as also when they decay, to see if they continue beautiful to the last, and not appear smeared over with the original colour; in both which cases they are very subject to go back to their old colour the next year: but if their stripes are distinct and clear to the bottom, and continue so to the last (which is what the florists call dyeing well), there is no great danger of their returning back again, as hath been by some confidently reported; for if one of these flowers is quite broken (as it is termed), it will never lose its stripes, though sometimes they will blow much fairer than at others, and the flowers of the offsets will be often more beautiful than those of the old roots.

This alteration in the colour of these flowers may be seen long before they are blown, for the green leaves will appear of a fainter colour, and seem to be striped with white, or of a brownish colour, which is a plain proof, that the juices of the whole plant are altered, or, at least, the vessels through which the juice is strained; so that hereby particles of a different figure are capable of passing through them, which, when entered into the petals of the flower, reflect the rays of light in a different manner, which occasions the variety we see in the colours of flowers. This breaking of the colours in flowers proceeds from weakness, or at least is the cause of weakness in plants; for it is observable, that after Tulips are broken into fine stripes, they never grow so tall as before, nor are the stems, leaves, or flowers so large; and it is the same in all other variegated plants and flowers whatever, which are also much tenderer than they were before they were striped; so that many sorts of exotic plants, which by accident have become variegated in their leaves, are often rendered so tender, as not to be preserved without much more care, though indeed the striping of Tulips doth never occasion so great weakness in them as to render them very tender. The greatest effect it hath on them, is in lessening their growth; the more beautifully their stripes appear, the shorter will be their stems, and the weaker their flowers.

There is nothing more to be observed in the culture of striped flowers than what has been directed for breeders, excepting that these should be arched over with tall hoops and rails, that they may be shaded from the sun in the day time, and protected from strong winds, hard rains, and frosty mornings, otherwise the flowers will continue but a short time in beauty; but where these instructions are duly followed, they may be preserved in flower a full month, which is as long as most other flowers continue.

There are some persons who are so extremely fond of these flowers, as to be at a great expence in erecting large frames of iron work to cover their beds of Tulips, in such a manner, that they may walk between two beds under the frames, over which are spread tarpaulins, so as to keep off sun, rain, and frost, whereby they can view the flowers without being at the trouble of taking off or turning up the tarpaulins, or being incommoded by the sun or rain, which cannot be avoided where the covering is low; besides, by thus raising the covers, the flowers have a greater share of air, so that they are not drawn so weak as they are when the covering is low and close to them; but these frames being expensive, can only be made by persons of fortune; however, there may be some of wood contrived at a smaller expence, which, being arched over with hoops, may answer the purpose as well as the iron frames, though they are not so sightly or lasting.

When the flowers are faded, the heads of all the fine sorts should be broken off, to prevent their seeding; for if this is not observed, they will not flower near so well the following

following year, nor will their stripes continue so perfect: this will also cause their stems to decay sooner than otherwise they would do, so that their roots may be taken up in *June*; for they should not remain in the ground after their leaves are decayed. In taking the roots out of the ground, you must be very careful not to bruise or cut them, which will endanger their rotting, and, if possible, it should be done a day or two after rain. When these roots are taken out of the ground, they must be cleared from their old covers, and all sorts of filth, and spread upon mats in a shady place to dry; after which they should be put up in a dry place, where vermin cannot get to them, observing to keep every sort separated; but they should not be kept too close from the air, nor suffered to lie in heaps together, lest they should grow mouldy, for if any of the roots once take the mould, they commonly rot when they are planted again.

The offsets of these roots, which are not large enough to produce flowers the succeeding year, should be also put by themselves, keeping each sort distinct; these should be planted about a month earlier in autumn than the blowing roots, in particular beds by themselves in the flower-nursery, where they may not be exposed to publick view; but the earth of the beds should be prepared for them in the same manner as for larger roots; these should not be planted above five inches deep, because they are not strong enough to push through so great covering of the earth as the old roots; they may also be placed much nearer together than those which are to flower, and in one year most of them will become strong enough to flower, when they may be removed into the flower-garden, and placed in the beds amongst those of the same kinds.

TULIPIFERA. *Herm. Hort. Leyd.* The Tulip tree.

The Characters are,

The proper involucre of the flower is composed of two angular leaves, which fall off; the empalement is composed of three oblong plain leaves like petals, which fall away. The flower is nearly of the bell-shape, and has six petals, which are obtuse and channelled at their base; the three outer fall off; it has a great number of narrow stamina, which are inserted to the receptacle of the flower, having long narrow summits fastened to their side, and many germen disposed in a cone, having no style, crowned by a single globular stigma. The germen afterward becomes scaly seeds, lying over each other like the scales of fish, and form the resemblance of a cone.

We have but one Species of this genus, viz.

TULIPIFERA. The Virginia Tulip-tree.

This is a native of *North America*, where it grows to be a tree of the first magnitude, and is generally known through all the *English* settlements by the title of Poplar. Of late years there has been great numbers of these trees raised from seeds in the *English* gardens, so that now they are become common in the nurseries about *London*, and there are many of the trees in several parts of *England* which do annually produce flowers. The first tree of this kind which flowered here, was in the gardens of the late earl of *Peterborough* at *Parsons Green* near *Fulham*, which was planted in a wilderness among other trees; before this was planted in the open air, the few plants which were then in the *English* gardens, were kept in pots or tubs, and housed in winter, supposing they were too tender to live in the open air; but this tree, soon after it was planted in the full ground, convinced the gardeners of their mistake, by the great progress it made, while those which were kept in pots and tubs, increased slowly in their growth; so that afterward there were many others planted in the full ground, which are now arrived to a large size, especially those which were planted in a moist soil. One of the handsomest trees of this kind near *London*, is in the garden of *Waltham-Abbey*; and at *Wilton* the seat of the earl of *Pembroke*, there are some

trees of great bulk; but the old tree at *Parsons-Green* is quite destroyed by the other trees which were suffered to overhang it, and rob it of its nourishment, from a fear of taking down the neighbouring trees, and admitting the cold air to the Tulip-tree it should injure it.

The young shoots of this tree are covered with a smooth purplish bark, garnished with large leaves, whose foot-stalks are long; they are ranged alternate; the leaves are of a singular form, being divided into three lobes; the middle lobe is blunt and hollowed at the point, appearing as if it had been cut with scissars. The two side lobes are rounded, and end in blunt points. The upper surface is smooth, and of a lucid-green; the under is of a pale green. The flowers are produced at the end of the branches; they are composed of six petals, three without and three within, which form a sort of bell-shaped flower, from whence the inhabitants of *North America* gave it the title of Tulip. These petals are marked with green, yellow, and red spots, so make a fine appearance when the trees are well charged with flowers. The time of this tree's flowering is in *July*, and when the flowers drop, the germen swells and forms a kind of cone; but these do not ripen in *England*.

This tree is propagated by seeds, which are now annually imported in great plenty from *America*. These should be sown as soon as they arrive, in pots or tubs, filled with light earth, from the kitchen-garden, or in a bed in the fall ground. Those which are sown in the first way, may be placed on a very gentle hot-bed, which will forward their growth; so that if they come up the same season, the plants will acquire more strength before winter. When the plants appear, they must be shaded in the heat of the day from the sun, but fresh air must be admitted daily to prevent their drawing up weak; and as the season advances, they must be gradually hardened to bear the open air. While the plants are young, they do not care for much sun, so they should be either shaded, or placed where the morning sun only shines upon them; they must also be constantly supplied with water, but not have it in too great plenty. As the young plants commonly continue growing late in the summer, so when there happens early frosts in autumn, it often kills their tender tops, which occasions their dying down a considerable length in winter; therefore they should be carefully guarded against these first frosts, which are always more hurtful to them than harder frosts afterward, when their shoots are better hardened; however, the first winter after the plants come up, it will be the better way to shelter them in a common hot-bed frame; or to arch them over with hoops, and cover them with mats, exposing them always to the open air in mild weather.

The following spring, just before the plants begin to shoot, they should be transplanted into nursery-beds, in a sheltered situation, where they are not too much exposed to the sun. The soil of these beds should be a soft gentle loam, not too stiff, nor over light; this should be well wrought, and the clods well broken and made fine. There must be great care taken not to break the roots of the plants in taking them up, for they are very tender; then they should be planted again as soon as possible, for if their roots are long out of the ground, they will be much injured thereby. These may be planted in rows at about a foot distance, and at six inches distance in the rows; for as they should not remain long in these nursery beds, so this will be room enough for them to grow; and by having them so close, they may be shaded in the summer, or sheltered in the winter, with more ease than when they are farther apart.

When the plants are thus planted, if the surface of the beds is covered with rotten tanners bark, or with moss, it will prevent the earth from drying too fast; so that the plants will not require to be so often watered, as they must

be where they are exposed to the sun and air; after this, the farther care will be to keep them clean from weeds, and if the latter part of summer should prove moist, it will occasion the plants growing late in autumn, so their tops will be tender and liable to be killed by the first frosts. In this case they should be covered with mats to protect them.

If the plants make great progress the first summer, they may be transplanted again the following spring; part of them may be planted in the places where they are to remain, and the other should be planted in a nursery where they may grow two years, to acquire strength before they are planted out for good; though the younger they are planted in the places where they are to stand, the larger they will grow, for the roots run out into length; and when they are cut, it greatly retards their growth, so that these trees should never be removed large, for they rarely succeed, if transplanted, when they are grown to a large size. Some trees I have seen removed pretty large, which have survived their removal; but young plants of two years old, which were planted near them, were much larger in fifteen years than the old ones.

When the seeds are sown upon a bed in the full ground, the bed should be arched over with hoops, and shaded in the heat of the day from the sun, and frequently refreshed with water; as should also the plants when they appear, for when they are exposed much to the sun while young, they make but small progress. The care of these in summer must be to keep them clean from weeds, supplying them duly with water, and shading them from the sun in hot weather; but as these seeds will not come up so soon as those which were placed on a hot-bed, they generally continue growing later in autumn, therefore will require shelter from the early frosts in autumn; for as the shoots of these will be much softer than those of the plants which had longer time to grow, so if the autumnal frosts should prove severe, they will be in danger of being killed down to the surface of the ground, by which the whole summer's growth will be lost, and sometimes the plants are entirely killed the first winter, if they are not protected.

As these plants will not have advanced so much in their growth as the other, they should remain in the seed-bed to have another year's growth before they are removed; therefore all that will be necessary to observe the second year, is to keep them clean from weeds, and now they will not be in so much danger of suffering from the warmth of the sun as before, therefore will not require such constant care to shade them, nor should the watering of them be continued longer than the spring; for if the autumn should prove dry, it will prevent the plants from shooting late, and harden those shoots which were made early in the year, whereby the plants will be in less danger from the early frosts.

After the plants have grown two years in the seed-bed, they will be strong enough to remove; therefore, in the spring, just at the time when their buds begin to swell, they should be carefully taken up, and transplanted into nursery-beds, and treated in the same way as has been before directed for the plants which were raised in pots.

There are some people who propagate this tree by layers, but the layers are commonly two or three years before they take root; and the plants so raised, seldom make such straight trees as those raised from seeds, though indeed they will produce flowers sooner, as is always the case with stunted plants.

This tree should be planted on a light loamy soil, not too dry, on which it will thrive much better than upon a strong clay, or a dry gravelly ground; for in *America* they are chiefly found upon a moist light soil, where they will grow to a prodigious size, though it will not be proper to plant these trees in a soil which is too moist, in *England*,

because it might endanger the rotting of the fibres of the roots, by the moisture continuing too long about them, especially if the bottom be a clay, or a strong loam, which will detain the wet.

TURKS CAP. See *Lilium and Castos*.

TURKEY WHEAT. See *Zea*.

TURNEP. See *Rapa*.

TURNERA. *Plum. Gen. Nov. 15. tab. 12.*

The Characters are,

The empalement of the flower is funnel shaped, of one leaf, having an oblong, cylindrical, angular tube, cut into five segments. The flower has five heart-shaped plain petals, with narrow tails, which are inserted in the tube of the empalement; it has five awl-shaped stamina, which are shorter than the petals, inserted in the empalement, terminated by acute-pointed erect summits, and a conical germen, supporting three slender styles, crowned by hairy many-pointed stigmas. The germen afterward turns to an oval capsule with one cell, which opens at the top with three valves, and contains several oblong obtuse seeds.

The Species are,

1. *TURNERA foliis lineari-lanceolatis hirsutis obtusè serratis, acuminatis.* Turnera with linear, spear-shaped, hairy leaves, which are obtusely indented and acute-pointed.

2. *TURNERA foliis ovato-lanceolatis serratis rugosis.* Turnera with oval spear-shaped leaves, which are sawed and rough.

These plants are both of them natives of the warm parts of *America*. The second species was found by father *Plumier* in *Martinico*, who gave it the name of *Turnera*, from *Dr. Turner*, a famous *English* physician, who lived in queen *Elizabeth's* reign.

The first sort was discovered by *Sir Hans Sloane*, who has figured it in his *Natural History of Jamaica*, under the following title; *Cistus urticæ folio, flore luteo, vasculis trigonis.* Vol. 1. p. 202. but both these sorts were observed by my late friend *Dr. William Houstoun*, in several parts of *America*.

The first sort rises with a shrubby stalk to the height of eight or ten feet, sending out branches on every side the whole length, garnished with narrow, spear-shaped, hairy leaves, terminating in acute points, sawed on their edges; these, when rubbed, emit a disagreeable odour. The flowers grow from the foot-stalks of the leaves, to which they fit very close, having two pretty large leafy appendages to their empalements. The flowers are of a pale yellow colour, composed of five large oval petals, whose tails are twisted and join; these are succeeded by short tubular capsules, having one cell, which opens at the top with three valves, which turn back, and let out the seeds.

The second sort has a shrubby stalk like the first, and rises to near the same height. The branches of this are slender, and stiffer than those of the former. The leaves are oval, spear-shaped, rough on their upper side, and of a lucid green; their under side has many strong veins, and is of a lighter colour; they are sawed on their edges, and have longer foot-stalks than those of the first species. The flowers fit close upon the foot-stalks of the leaves, in like manner as the former, but the flowers are larger, and of a brighter yellow than those. These differences remain constant, and never alter when raised from seeds; so that from near thirty years experience in sowing the seeds, I may pronounce them different species.

The plants are easily propagated by sowing their seeds on a hot-bed early in the spring; and when the plants are come up two inches high, they should be transplanted into small pots, and plunged into a hot-bed of tanners bark, observing to water and shade them until they have taken root; after which they must be treated, as hath been directed for the *Guavas*, and other tender plants from the same countries, to which the reader is desired to turn, to avoid

avoid repetition. The seeds of these plants will often fall into the pots which are placed near them in the stove, which will grow, and soon furnish plants enough, after a person is once possessed of them. As they are too tender to live in the open air in *England*, they must be placed in the bark-bed in the stove, where, during the winter season, they must be kept warm, and frequently watered; but in the summer season they must have a great share of air, otherwise they will draw up tender, and not produce many flowers.

When the plants are grown pretty large, they may be treated more hardily, by placing them in the dry stove, where, if they are kept in a moderate degree of heat, they will thrive and flower very well. Those who would save the seeds of these plants, must watch them carefully, because, when they are ripe, they soon scatter if they are not gathered.

These plants produce their flowers great part of the year, if they are kept in a proper degree of warmth, so that there are some of the flowers in beauty for at least nine or ten months, which renders the plants more valuable.

TURNSOLE See *Heliotropium* and *Croton*.

TURRITIS. *Tourn. Inst. R. H.* 223. Tower Mustard.

The Characters are,

The empalement of the flower is composed of four oblong oval leaves, which close together. The flower has four oblong, oval, entire petals, placed in form of a cross, and six erect awl shaped stamina the length of the tube, two of which are shorter than the other, terminated by single summits, and a taper germen a little compressed, having no style, but is crowned by an obtuse stigma. The germen afterward becomes a long four-cornered pod with two cells, which are divided by an intermediate partition, opening with two valves, and filled with small, roundish, indented seed.

The Species are,

1. TURRITIS *foliis radicalibus dentatis hispida, caulinis integerrimis amplexicaulis glabris. Hort. Cliff.* 339. Tower Mustard with prickly lower leaves, which are indented, and the upper ones smooth, entire, and embracing the stalk.

2. TURRITIS *foliis omnibus hispida, caulinis amplexicaulis. Hort. Cliff.* 339. Tower Mustard with all the leaves prickly, and the upper ones embracing the stalk.

3. TURRITIS *foliis omnibus integerrimis glabris. Tower Mustard*, whose leaves are all entire and smooth.

The first sort grows naturally in several parts of *England*, upon walls and dry banks; this hath its lower leaves much jagged on their edges, and rough. The stalks rise two feet high, garnished with smooth grayish leaves, ending in points, which embrace the stalks with their base. The upper part of the stalk has slender branches, proceeding from the wings of the leaves, which sustain spikes of small white flowers, having four petals, placed in form of a cross: These are succeeded by long, slender, compressed, four-cornered pods, which grow erect close to the stalk, filled with small seeds.

The third sort grows naturally in rough stony ground about *Montpelier*. This is much smaller than either of the former; the leaves are smooth, and all of them entire; the stalks are erect, and seldom branch; the leaves embrace them with their base. The flowers and pods are like the former, but are smaller.

The second sort grows naturally upon old walls and buildings in the northern counties of *England*; the lower leaves are shaped like those of the Daisy, but rough. The stalks rise eight or ten inches high, garnished with oval leaves, whose bases embrace the stalks; they are as rough as the lower leaves. The upper part of the stalks branch into slender stalks, which sustain short spikes of white flowers

like those of the former sort, which are succeeded by slender pods, having four corners shorter than those of the first sort.

These plants are kept in botanick gardens for variety; but if their seeds are scattered upon an old wall or building in autumn, soon after they are ripe, the plants will come up, and thrive without farther care, and their seeds will scatter on the walls and spread, so there will be no danger of the plants maintaining their situation, if they are not purposely destroyed.

The other species inserted in the former editions of this work, are referred to *ARABIS*, *BRASSICA*, and *HESPERIS*, under which articles they will be found.

TUSSILAGO. *Tourn. Inst. R. H.* 487. *tab.* 276. *Lin. Gen. Plant.* 856. Colt's-foot.

The Characters are,

The flower has one common cylindrical empalement, whose scales are linear, spear-shaped, and equal. The flower is made up of hermaphrodite florets which compose the disk, and female half florets which form the rays or border. The hermaphrodite florets are funnel shaped, cut at the brim into five segments; these have five short hair-like stamina, terminated by cylindrical summits, and a short crowned germen, supporting a slender style, crowned by a thick stigma. The germen afterward becomes an oblong compressed seed, crowned with a hairy down. The female half florets are stretched out on one side with a narrow tongue-shaped segment; these have no stamina, but have a short crowned germen, which turns to a seed like those of the hermaphrodite florets, which ripen in the empalement.

The Species are,

1. TUSSILAGO *scapo imbricato uniflora, foliis subcordatis, angulatis denticulatis. Lin. Hort. Cliff.* 411. Colt's-foot with an imbricated stalk bearing one flower, and angular indented leaves, which are nearly heart-shaped; or common Colt's-foot.

2. TUSSILAGO *scapo uniflora, foliis lyrato ovatis. Lin. Sp. Plant.* 865. Colt's-foot with one flower on each stalk, and oval lyre-shaped leaves.

3. TUSSILAGO *scapo subnudo uniflora, foliis cordato-orbiculatis crenatis. Hort. Cliff.* 411. Colt's-foot with an almost naked stalk bearing one flower, and orbicular, heart-shaped, crenated leaves.

The first of these sorts is very common in watery places in almost every part of *England*, and is rarely kept in gardens; for the roots creep under ground, and increase so fast, that in a short time they will spread over a large spot of ground. This plant is so well known, as to need no description.

The second sort grows naturally in *Siberia*; this is a very low plant, whose leaves grow close to the ground, of an oval form, indented on the sides like a lute. The flowers stand upon short foot stalks, which rise between the leaves, each sustaining one flower at the top, of a dirty purplish colour. These are succeeded by downy seeds.

The third sort grows naturally on the *Alps*; this is a low perennial plant, whose leaves are round, indented at the foot-stalk in form of a heart; their edges are crenated; their upper surface is smooth, of a bright green colour; their under sides are a little downy and whitish. The foot-stalks of the flowers, which arise from the root, sustain one purplish flower at the top, which is made up of hermaphrodite and female florets, like those of the other sorts.

The two last are frequently kept in gardens for the sake of variety; they are easily propagated by parting their roots in autumn, and must be planted in a moist shady border, where they will thrive, and require no farther care but to keep them clean from weeds.

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VACCARIA. See Saponaria.

VACCINIUM. *Lin. Gen. Plant.* 434. The Bill-berry, Whortle-berry, or Cran-berry.

The Characters are,

The flower has a small permanent empalement sitting upon the germen; it is bell-shaped, of one petal, slightly cut into four segments at the brim, which turn backward; it has eight stamina, terminated by horned summits, having two awns on their backside which spread asunder. The germen is situated below the flower, supporting a single style longer than the stamina, crowned by an obtuse stigma; it afterwards turns to an umbilicated globular berry with four cells, containing a few small seeds.

The Species are,

1. **V**ACCINIUM *pedunculis unifloris, foliis ovatis serratis deciduis, caule angulato.* *Flor. Lapp.* 143. Whortle-berry with one flower upon each foot-stalk, oval sawed leaves which fall off in winter, and an angular stalk.

2. **V**ACCINIUM *racemis terminalibus nutantibus, foliis ob-ovatis revolutis integerrimis subtus punctatis.* *Lin. Sp. Plant.* 351. Whortle-berry with nodding bunches of flowers terminating the branches, and oval leaves which are entire, turned back, and punctured on their under side; Red-whorts, or Whortle-berries.

3. **V**ACCINIUM *foliis ovatis mucronatis, floribus alaribus nutantibus.* Whortle-berries with oval-pointed leaves, and nodding flowers proceeding from the wings of the stalks.

4. **V**ACCINIUM *foliis integerrimis revolutis ovatis, caulibus repentibus, filiformibus, hispidis.* *Lin. Sp. Plant.* 352. Whortle-berries with oval entire leaves turning back, and a slender, creeping, bristly stalk.

5. **V**ACCINIUM *foliis integerrimis revolutis ovatis, caulibus repentibus filiformibus nudis.* *Lin. Sp. Plant.* 351. Whortle-berries with oval, entire, reflexed leaves, and naked, slender, creeping stalks. Moss-berries, or Moor-berries; by some called Cran-berries.

The first sort grows very common upon large wild heaths, in many parts of *England*, but is never cultivated in gardens, it being with great difficulty transplanted; nor will it thrive long when moved thither; for from many trials which I have made, by taking up the plants at different seasons with balls of earth to their roots, and planting them in gardens, I could never succeed so as to preserve the plants above two years, and those never produced any fruit, so that it is not worth the trouble of cultivating.

The fruit of this sort is gathered by the poor inhabitants of those villages which are situated in the neighbourhood of their growth, and carried to the market towns. These are by some eaten with cream or milk; they are also put into tarts, and much esteemed by the people in the north, but they are seldom brought to *London*. The shrub on which these grow, rises about two feet high, having many stems which are garnished with oblong leaves, shaped like those of the Box-tree, but somewhat longer, and are a little sawed on their edges. The flowers are shaped like those of the Arbutus, or Strawberry-tree, of a greenish white colour, changing to a dark red toward the top. The fruit are about the size of large Juniper-berries, and of a deep purple

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colour, having a sue upon them when they are untouched, like the blue Plumbs, which rub off with handling.

The second sort is of a much humbler growth, seldom rising above six or eight inches high. The leaves of this are so like that of the dwarf Box, as that, at a distance, the plants are often taken for it even by persons of skill. This is an ever-green, which grows upon moory ground in several parts of the north, but it is full as difficult to transplant into gardens, as the other sort, though I have been assured by persons of credit, that they have seen this sort planted to make edgings to the borders of the gardens in *Norway* and *Sweden*, where the plants may grow much better from the cold of those climates, than they will do in *England*, for this is a native of very cold countries. I have several times received plants of this sort from *Greenland*, by the whale-ships. The berries of this sort are red, and have a more agreeable acid flavour than those of the first sort. The fruit is frequently used for tarts in several of the northern counties, where the plants grow wild upon the moors.

The third sort grows naturally in *Virginia* and other parts of *North America*; this has a low shrubby stalk like the second. The leaves are small, oval, pointed, and not unlike some sorts of Myrtle; they continue green all the year. The flowers come out from the wings of the leaves at every joint; their foot-stalks are pretty long, and nod downward; they sustain but one flower; they are small, white, and are succeeded by small red berries which seldom ripen here.

The fourth sort grows naturally in marshy grounds in most parts of *North America*. The stalks of this are slender, imbricated, and trail upon the ground; the scales are bristly; the leaves are oval, entire, and their edges turn backward; the flowers come out from the wings of the stalk, of an herbaceous white colour, and in their native soil are succeeded by large red berries, but in *England* the fruit never comes to perfection.

The plants of this sort are difficult to preserve in *England*, for they require a moorish, boggy soil, which should be covered with moss, and constantly kept wet, otherwise they will not thrive.

The fifth sort produces long slender branches, not bigger than thread, which trail upon the mossy bogs, so are often hid by the moss. These branches are thinly garnished with small leaves, about the size and shape of those of Thyme, having their upper surface of a shining green colour, but are white underneath. The flowers are generally produced toward the extremity of the shoots, which are in shape like those of the former sorts, but are smaller, and of a red colour; these grow upon long slender foot-stalks, and are succeeded by round, red, spotted berries, of a sharp acid flavour, which are much esteemed by the inhabitants of the places near the bogs where they grow. Some use them for tarts, and others eat them with milk or cream.

This sort is a native of bogs, therefore cannot by any art be propagated upon dry land; but where there are natural bogs, the plants may be taken up carefully, preserving some of the soil to their roots, and transplanted into the bogs in the autumn; and if they are once fixed in the place

place, they will spread and propagate themselves in great plenty, and require no farther care.

The two sorts first mentioned also propagate very fast by their creeping roots, so that when they are fixed in a proper soil, they will soon overspread the ground, for the heaths, upon which they naturally grow, are generally covered with the plants. The first sort grows with the heath, their roots intermixing together, and frequently is found upon sandy heaths in divers parts of *England*; but the second sort grows only upon moorish land, where, by its creeping roots, the ground is soon covered with the plants.

There are several other species of this genus, some of which are natives of *Spain* and *Portugal*, others of *Germany* and *Hungary*, and several of the northern parts of *America*, from whence those large fruit are brought to *England*, which are used by the pastrycooks of *London*, during the winter season for tarts; but as all these sorts naturally grow upon swamps and bogs, they are not easy to transplant into gardens in their native country, so as to thrive, or produce fruit, therefore there can be little hopes of cultivating them to advantage in *England*.

VALERIANA. *Tourn. Inst. R. H.* 131. tab. 52. Valerian.

The Characters are,

The flower has a small empalement; it has one tubulous petal cut into five obtuse segments at the brim, with a gibbous honey gland on the inside; it has three small, erect; awl-shaped stamina, the length of the petals, terminated by roundish summits. The germen is situated under the flower, supporting a slender style crowned by a thick stigma; it afterward turns to a crowned capsule which falls off, in which is lodged a single seed.

The Species are,

1. VALERIANA floribus triandris, foliis caulinis pinnatis, radicalibus indivisis. *Hort. Upsal.* 13. Valerian with flowers having three stamina, winged leaves to the stalks, but those at the root undivided; Garden Valerian.

2. VALERIANA floribus triandris, foliis omnibus pinnatis. *Hort. Cliff.* 15. Valerian with three stamina to the flowers, and all the leaves winged; Greater wild Valerian.

3. VALERIANA floribus monandris caudatis, foliis lanceolatis integerrimis. *Hort. Cliff.* 15. Valerian with flowers having tails, but one stamina, and spear-shaped entire leaves; Red Valerian.

4. VALERIANA floribus monandris caudatis, foliis linearibus integerrimis. Valerian with tailed flowers having one stamina, and linear entire leaves; Narrow-leaved red Valerian.

5. VALERIANA floribus monandris, foliis pinnatifidis. *Hort. Upsal.* 14. Valerian with flowers having one stamina, and wing-pointed leaves.

6. VALERIANA floribus triandris, foliis cordatis serratis petiolatis, summis ternatis. *Hort. Cliff.* 15. Valerian with three stamina to the flowers, and heart-shaped sawed leaves growing on foot-stalks, placed by threes at the top.

7. VALERIANA floribus triandris, foliis ovato-oblongis obtusis integerrimis. *Lin. Mat. Med.* 23. Valerian with three stamina to the flowers, and oblong, oval, blunt, entire leaves; Celtick Nard.

8. VALERIANA floribus tetrandis æqualibus, foliis pinnatifidis, seminibus paleâ ovali adnatis. *Hort. Upsal.* 13. Valerian with four equal stamina to the flowers, wing-pointed leaves, and seeds fastened to an oval husk.

9. VALERIANA caule dichotomo, foliis lanceolatis integris. *Vir. Cliff.* 5. Valerian with a stalk branching two ways, and spear-shaped entire leaves; Corn-sallad, or Lambs-lettuce.

10. VALERIANA caule dichotomo, foliis lanceolatis serratis, calycibus inflatis. *Hort. Cliff.* 16. Valerian with a stalk branching two ways, spear-shaped sawed leaves, and swollen empalements.

11. VALERIANA caule dichotomo, foliis lanceolatis dentatis,

fructu sexdentato. *Hort. Cliff.* 16. Valerian with a stalk divided two ways, spear-shaped indented leaves, and a fruit having six indentures.

12. VALERIANA floribus diandris ringentibus, foliis ovatis sessilibus. *Hort. Cliff.* 15. Valerian with a ringent flower having two stamina, and oval leaves set close to the stalk.

There are some other species of this genus which grow naturally in *England*, and others in different parts of *Europe*: but, as they are seldom cultivated in gardens, they are omitted, lest the work should swell beyond its intended bulk.

The first of these sorts is propagated in *England* for medicinal use, and is called in the shops by the name of Phu, to distinguish it from the Mountain Valerian, which is also used in medicine, and is preferred to all the other sorts by the modern physicians, though the roots of the first are still continued in some of the capital medicines, and are by some esteemed equal in virtue, if not superior, to the wild sort.

This hath thick, fleshy, jointed roots, which spread near the surface of the ground in a very irregular manner, crossing each other, and matting together by their small fibres; they have a very strong scent, especially when dry. The lower leaves, which rise immediately from the root, are many of them entire; others are divided into three, five, or seven obtuse smooth lobes, of a pale green colour. The stalks rise three or four feet high; they are hollow, and send out branches from their side by pairs, garnished with winged leaves, placed opposite at each joint, which are composed of four or five pair of long narrow lobes terminated by an odd one. The branches are terminated by flowers disposed in form of an umbel, which are small, tubulous, white, and cut slightly at the brim into five parts; these are succeeded by oblong flat seeds having a downy crown. It grows naturally in *Alsatia*, but has been long cultivated in our gardens.

It is propagated by parting of its roots, either in the spring or autumn, but the latter is much preferable; these should be planted in beds of fresh earth about two feet asunder, for they commonly spread and multiply very fast. If the season is dry, you must water the plants until they have taken root; after which they will require no further care, but to keep them clean from weeds, and in autumn, when their leaves are decayed, the roots should be taken up and dried for use.

The second sort is generally found upon dry chalky soils, in shady places, in divers parts of *England*. The roots of this, which grow wild upon such soils, are much preferable to those of the same kind which are cultivated in gardens, when gathered from their native places of growth, where they are smaller, but have a stronger flavour.

The roots of this plant are composed of long fleshy fibres, which unite in heads. All the leaves of this sort are winged; those at the bottom are composed of broader lobes than those on the stalks, they are notched on their edges and are hairy. The stalks, in their natural situation, seldom grow more than a foot high, but, when the roots are cultivated in a garden, they grow twice that height; these are channelled, hollow, hairy, and garnished at each joint with two winged leaves placed opposite, whose lobes are very narrow and almost entire. At the upper part of the stalk comes out two small side branches opposite; these, and also the principal stalk, are terminated by clusters of flowers, formed into a kind of umbel, which are shaped like those of the first sort, but smaller, and have a tinge of purple on their outside.

This plant may also be propagated by parting the roots either in spring or autumn, as was directed for the first sort, but should always be planted upon a dry, fresh, undunged

foil, in which, though the roots will not make near so great progress as in a rich moist soil, yet they will be much preferable for use. These roots should also be taken up, when the leaves decay in autumn, and preserved dry until used.

The third sort grows naturally in rough stony places in the south of *France*, and in *Italy*, but has been long cultivated in the *English* gardens for ornament.

The roots of this sort are ligneous, and as thick as a man's finger, spreading very wide. The stalks rise three feet high; they are smooth, of a grayish colour, and hollow, garnished at each joint with smooth spear-shaped leaves. The upper part of the stalk sends out branches by pairs, which, with the principal stalk, are terminated with red flowers growing in clusters, which have long tubes, cut into five parts at the top, and from the tube is sent out a spur or heel, like the flowers of Larkspur. It flowers most part of summer, and the seeds ripen accordingly in succession.

There is a variety of this with white flowers, and one with pale flesh-coloured flowers, but they do not differ in any other respect.

It is easily propagated by parting of the roots in autumn, or by sowing of the seeds soon after they are ripe, in a shady border, where the plants will sometimes come up the same autumn, especially if the season proves moist, otherwise they will not appear till the following spring. When these are fit to remove, they should be transplanted into beds at about nine inches or a foot asunder, observing to water them till they have taken new root; after which they will require no farther care, but to keep them clear from weeds, and in autumn they must be transplanted where they are to remain.

These plants grow large, therefore should have room, so are not proper furniture for small gardens. When the seeds of these plants light on joints of old walls or buildings, the plants will come up, and thrive as well as in the ground, and will continue much longer, so the seeds may be scattered between the stones of grottos and such like buildings, where the plants will flower from *May* till the frost stops them, and will make a good appearance.

The fourth sort grows about *Montpelier*, and upon mount *Baldus* in *Italy*. The root of this is ligneous, but not so large as that of the former sort; the stalks rise about two feet high or better, and branch out on each side from the root to within six inches of the top, garnished with leaves which are as narrow as those of Flax. The upper part of the stalk is naked, and terminated by a compact cluster of bright red flowers, shaped like those of the former sort, but smaller.

The fifth sort grows naturally in *Spain* and *Portugal*; it is an annual plant, which perishes soon after the seeds are ripe. The lower leaves, which spread on the ground, are cut into many obtuse segments; the stalks, when the plants are in good ground, will rise near a foot and a half high, but on dry stony soils not half so high, and when they grow out of the joints of old walls, not more than three inches; they are hollow, smooth, and send out branches by pairs from the upper joints, garnished with wing-pointed leaves, whose lobes or segments are very narrow. The stalk and branches are terminated by tufts of flowers shaped like those of the Garden Valerian, but smaller, and have a flesh-coloured tinge at the top. The seeds have a down, which helps to spread them, so it propagates without care.

The sixth sort grows naturally on the *Pyrenean* mountains; this has a fibrous perennial root, from which come out many heart-shaped leaves standing upon foot-stalks more than a foot in length. The leaves are bluntly sawed on their edges, smooth, and of a bright green on their upper side,

but their under side is pale and a little hairy. The stalks rise three feet high; they are hollow, channelled, and send out branches opposite toward the top, garnished with leaves placed opposite, which are shaped like those below, but pointed, and frequently at the top there are three leaves placed round the stalk, standing upon short foot-stalks. The stalk and branches are terminated by pale flesh-coloured flowers, disposed in form of umbels, which have very short spurs or heels. The seeds ripen in *August*, which are crowned with down, whereby they are transported to a distance.

This plant delights in shade and a moist soil; it may be propagated by sowing of the seeds on a shady border soon after they are ripe, and when the plants come up, they should be treated in the same way as is before directed for the third sort.

The seventh sort grows naturally upon the *Alps* and *Styrian* mountains; this was sent me by *Dr. Allione* from *Turin*, who gathered it on the *Alps* near that place; it is a very humble plant. The stalks trail upon the ground among the moss, and put out roots at their joints, which swell into knobs or tubers. The leaves are oblong, oval, and entire; the flower-stalks rise three or four inches high, garnished with two or three pair of small oval leaves; the flowers are small, of a pale incarnate colour, and are formed in a loose spike sitting very close to the stalk.

This plant is difficult to preserve in gardens, for it naturally grows upon rocky mountains which are covered with moss, where the snow continues six or seven months, so it requires a very cold situation and a stony soil.

The eighth sort grows naturally in *Siberia*; this is a biennial plant, which flowers and produces seeds the second year, and then decays. The leaves of this are winged; the lobes of the lower leaves are oblong, oval, ending in roundish points; the stalks rise a foot high, garnished with leaves, composed of four or five pair of lobes, terminated by a broad one which is cut into three or five points. The lobes are acute-pointed; the leaves are smooth, placed by pairs, and sit close to the stalks. The upper part of the stalk has two pair of branches; the lower pair are near three inches long, but the upper are not half that length; these, and also the principal stalk, are terminated by bright yellow flowers, collected in a sort of umbel, shaped like those of the first sort. It is propagated by seeds, which should be sown where the plants are to remain; this may be performed either in autumn, soon after they are ripe, or in the spring; they have succeeded with me equally at both seasons. When the plants come up, they must be thinned where they are too close, and kept clean from weeds, which is all the culture they require.

The ninth sort is the common Corn-sallad which is cultivated in gardens, but is found growing naturally upon arable land amongst the Corn, in many parts of *England*; this is an annual plant, which dies when it has perfected its seeds. The lower leaves of this are oblong, and broad at their points, which are rounded, and narrowed at their base, where they embrace each other. From between the leaves arises an angular stalk, from three to eight or nine inches high, which divides into two branches which spread from each other, and these both divide again into two other in like manner, garnished with leaves shaped like those at the bottom, but smaller, placed by pairs at each joint. The branches are terminated by clusters of white flowers, shaped like those of the other species, which are succeeded by pretty large roundish seeds a little compressed on one side. The seeds are very apt to drop before they have changed colour.

It is cultivated as a sallad-herb for the spring, but, having a strong taste which is not agreeable to many palates, it is not so much in use as it was formerly; it is propagated by

by seeds, which should be sown the latter end of August, then the first rains will bring up the plants, which should be hoed to thin them where they are too close, and to destroy the weeds. Early in the spring the plants will be fit for use. The younger the plants are when used, the less strong will be their taste, so they may supply the table in a scarcity of other herbs. When the seeds of this sort are sown in the spring, if the season proves dry, the plants will not appear till autumn or the spring following; besides, in summer the herb is not so fit for use. I have known the seeds of this plant lie in the ground many years, when they have happened to be buried deep, and upon being turned up to the air, the plants have come up as thick as if the seeds had been newly sown.

There are two other species of this which grow naturally in England, but, as they are seldom admitted into gardens, I have not enumerated them; these are by some supposed to be only accidental varieties, but I have sown them all several years, and have never found either of them alter.

The tenth sort grows naturally in *Candia*; this is an annual plant, whose stalks rise six or eight inches high, and divide by pairs like the former. The leaves are much narrower than those of the former, end in acute points, and are sawed on their edges: the flowers are like those of the former sort, but have a swollen bladder empalement, which incloses the seeds.

The eleventh sort grows naturally in *Italy*. The leaves at bottom are long, round-pointed, and deeply notched on their edges; the stalk rises near a foot high, sending out branches opposite; the upper part divides by pairs in the same manner as the former. The flowers are collected in globular heads, of an herbaceous white colour, and are succeeded by starry fruit having six indentures. This and the former sort are supposed to be only varieties arising from the same seeds, but I have sown them more than thirty years, and have not observed either of them vary.

The twelfth sort grows naturally in the arable fields in *Sicily* and *Spain*; this is an annual plant. The stalks are channelled, of a purplish colour, eight or nine inches high, garnished by oval smooth leaves placed by pairs at each joint, sitting close to the stalks, of a lucid green. From each side of the stalk springs out slender branches, but the upper part divides into two spreading branches like the other sorts. The joints are swelling, and the branches divide again by pairs, which are terminated by clusters of red flowers, shaped like those of the red Valerian, but larger; they have two leaves close under the bunches, embracing the stalks with their base. When the flowers are past, the fruit stretches out in shape of a *Cornucopia*, or horn of plenty.

These three sorts are propagated by seeds, which should be sown in autumn where the plants are to remain. When these come up, they will require no other culture but to thin them where they are too close, and keep them clean from weeds. The plants, which rise in autumn, will live through the winter, and come early to flower the following summer, so will produce good seeds; whereas those which are sown in the spring, do not ripen their seeds unless the season proves warm.

VALERIANA GRÆCA. See Polemonium.

VALERIANELLA. See VALERIANA.

VANILLA. Plum. Gen. Nov. 25. tab. 28.

The Characters are,

It has a single stalk. The flowers are included in sheaths sitting upon the germen, and have no empalement; they have five oblong petals which spread open very wide, with turbinated nectariums, whose base are tubulous, situated on the back side of the petals; their brims are oblique and bifid; the upper lip is short and trifid; the under one runs out in a long point; they have two very short stamina sitting upon the pointal, and the summits are

fastened to the upper lip of the nectarium; they have long, slender, contorted germen, situated under the flower, supporting a short style fastened to the upper lip of the nectarium, crowned by an obsolete stigma. The germen afterward becomes a long, taper, fleshy pod, including many small seeds.

The Species are,

1. VANILLA foliis oblongo-ovatis mucronatis, nervosis, floribus alternis. Vanilla with oblong, oval, acute-pointed, veined leaves, and flowers growing alternately.

2. VANILLA foliis oblongis obtusis, compressis articulatis, floribus alaribus. Vanilla with oblong, blunt, compressed, jointed leaves, and flowers proceeding from the sides of the stalks.

The first sort is that which the Spaniards cultivate in the *West Indies*, which we shall describe hereafter.

The second sort was sent me from *Carthagena* in *New Spain*, where it grows naturally; this has a climbing stalk, sending out roots from the joints, which fasten to the stems of trees or any neighbouring support, and climb to a great height. The leaves, which come out singly at each joint, are oblong, smooth, and jointed. The flowers come out from the side of the branches, shaped like those of the great Bee Orchis, but longer: the galea or helmet of the flower is of a pale Pink colour, and the labia is purple. This plant flowered in the *Chelsea* garden, but wanting its proper support, it lived but one year.

There are two or three varieties of the first sort, which differ in the colour of their flowers and the length of their pods; and there are many other species which grow naturally in both the *Indies*, which have been brought to this genus, but those abovementioned are all I have seen growing.

The plant, which produces the fruit called Vanilla or Bannilla, by the Spaniards, hath a trailing stem, somewhat like common Ivy but not so woody, which fastens itself to whatever tree grows near it, by small fibres or roots produced at every joint, which fasten to the bark of the tree, and by which the plants are often nourished, when they are cut or broken off from the root a considerable height from the ground, in like manner as the Ivy is often seen in *England*. The leaves are as large as those of the Common Laurel, but are not of so thick a substance; they are produced alternately at every joint, of a lively green colour on the upper side, but paler underneath. The stems of these plants shoot into many branches, which fasten themselves also to the branches of the trees, by which means they rise to the height of eighteen or twenty feet, and spread quite over some of the smaller trees, to which they are joined. The flowers are of a greenish yellow colour, mixed with white, which, when fallen, are succeeded by the fruit, which are six or seven inches long.

The sort which is manufactured, grows not only in the *Bay of Campeachy*, but also at *Carthagena*, at the *Caracas*, *Honduras*, *Darien*, and *Cayan*, at all which places the fruit is gathered and preserved, but is rarely found in any of the *English* settlements in *America*, though it might be easily carried thither and propagated; for the shoots of these plants are full of juice, so may be easily transported, because they will continue fresh out of the ground for several months. I had some branches of this plant, which were gathered by Mr. Robert Millar at *Campeachy*, and sent over between papers by way of sample, and had been at least six months gathered when I received them; but upon opening the papers I found the leaves rotten, with the moisture contained in them, and the paper was also perished with it, but the stems appeared fresh; upon which I planted some of them in small pots, and plunged them into a hot-bed of tanners bark, where they soon put out leaves, and sent forth roots from their joints; but, as these plants naturally fasten themselves to the stems of the trees, in the woods where they

grow naturally, so it is with great difficulty that they are kept alive, when they have not the same support; therefore, whoever would preserve any of these plants in *Europe*, should plant them in tubs of earth, near the stem of some vigorous *American* tree, which requires a stove, and can bear a great deal of water, because the *Vanillas* must be plentifully watered in the summer season, otherwise they will not thrive. They require also to be shaded from the sun by trees, so that if these are planted at the foot of the *Hernandia*, or *Jack-in-a-Box*, whose leaves are very large, and afford a good shade, they will succeed better than when they are exposed in single pots alone; and as these plants require the same degree of heat in winter, they will agree well together.

When these plants are designed for propagation in the warm parts of *America*, there is nothing more required than to make cuttings of about three or four joints in length, which should be planted close to the stems of trees, in low marshy places, and to keep down other troublesome plants, which, if permitted to grow about the cuttings before they are well rooted, would overbear and destroy them; but after they are established, and have fastened their shoots to the stems of the trees, they are not in much danger of being injured by neighbouring plants, though, when the ground is kept clear from weeds, the plants will be much better nourished.

These plants do not produce flowers until they are grown strong; so that the inhabitants affirm, that it is six or seven years from the planting to the time of their bearing fruit; but when they begin to flower and fruit, they continue for several years bearing, and this without any culture; and as it is a commodity which bears a good price, it is well worth cultivating in several of the *English* settlements, especially as they will grow on moist woody places, where the land is not cleared from timber.

The method used to preserve the fruit is, when it turns of a yellow colour, and begins to open, to gather it, and lay it in small heaps to ferment two or three days, in the same manner as is practised for the *Cocoa* or *Chocolate* pods; then they spread them in the sun to dry, and when they are about half dried, they flat them with their hands, and afterwards rub them over with the oil of *Palma Christi*, or of the *Cocoa*; then they expose them to the sun again to dry, and afterward they rub them over with oil a second time; then they put them in small bundles, covering them with the leaves of the *Indian Reed* to screen them from air.

These plants produce but one crop of fruit in a year, which is commonly ripe in *May*, fit for gathering, for they do not let them remain on the plants to be perfectly mature, because then they are not fit for use; but when they are about half changed yellow, they esteem them better for keeping than when they are changed to a dark brown colour; at which time the fruit splits, and shews a great quantity of small seeds, which are inclosed within it. While the fruit is green, it affords no remarkable scent, but as it ripens, it emits a most grateful aromack scent. When the fruit begins to open, the birds attack them and devour all the seeds very greedily, but do not eat any other part of the fruit.

The fruit which are brought to *Europe*, are of a dark brown colour, about six inches long, and scarce an inch broad; they are wrinkled on the outside, and full of a vast number of black seeds, like grains of sand, of a pleasant smell, like *Balsam of Peru*.

The fruit is only used in *England*, as an ingredient in *Chocolate*, to which it gives a pleasant flavour to some palates, but to others it is very disagreeable; but the *Spanish* physicians in *America* use it in medicine, and esteem it grateful to the stomach and brain, for expelling of wind, to pro-

voke urine, to resist poison, and cure the bite of venomous animals.

As this plant is so easily propagated by cuttings, it is very strange that the inhabitants of *America* should neglect to cultivate it, especially as it is an ingredient in their *Chocolate*, which is so much drank all over *America*; but, as the *English* have in a manner quite neglected the culture of the *Cocoa*, it is no wonder they should neglect this, since the former was cultivated in great plenty by the *Spaniards* in *Jamaica*, while that island remained in their possession; so that the *English* had an example before them, if they would have followed it, whereas the *Vanilla* was not found growing there; and therefore it is not to be supposed, that the persons, who were so indolent as to quit the culture of many valuable plants then growing on the spot, should be at the trouble of introducing any new ones.

VEGETABLE, a term applied to all plants, considered as capable of growth, *i. e.* to all natural bodies, which have parts organically formed for generation and accretion, but not for sensation.

VEGETATION is the act whereby plants receive nourishment and grow, and signifies the way of growth, or increase of bulk, parts, and dimensions proper to all trees, shrubs, herbs, plants, &c. *a.*

In some trees it is chiefly the roots which vegetate; so that if they are cut into as many pieces as reasonably may be, if these pieces are but planted in the ground, they quickly grow, as is seen in the *Elm*, and many other trees.

In some it is seated both in the roots, and all over the trunk and branches, as in the *Willow* and other kinds, which, if cut into a thousand pieces, it is scarce possible to destroy or kill them, unless they are stripped of both their barks; for if they are in the earth but the length of three or four inches, they will put out roots and branches, so will certainly grow again.

The use of this principle of life is accounted to be for the concoction of the indigested salts, which ascend through the roots, where they are supposed to assimilate the nature of the tree they are helping to form, though perhaps the root may likewise assist in the work.

These things being presupposed in the spring of the year, as soon as the sun begins to warm the earth, and the rains melt the latent salts, the whole work of vegetation is set on foot; then the emulgent fibres seek for food, which has been prepared as aforesaid.

There are some who suppose that subterraneous fires are concerned in the work of vegetation, or the growth of plants; yet as, upon the best observation that can be made, none can pretend to have discovered any heat or fumigation to issue from the bowels of the earth, adequate to the meanest artificial fire, it is plain that the sun is the principle, and so may be called the Father of Vegetation, and the earth the Mother, the rain and air being necessary co-efficients in this surprising work.

The curious *Malpighius* has very accurately delivered the process of nature in the vegetation of plants to the effect following:

The ovum or seed of the plant being excluded out of the ovary (which is called the pod or husk), and requiring farther fostering and brooding, is committed to the earth. The earth, like a kind mother, having received it into her bosom, does not only perform the office of incubation, by her own warm vapours and exhalations, in conjunction with the heat of the sun, but gradually supplies what the seed requires to its farther growth, as abounding every-where with canals and sinuses, in which the dew and rain water, impregnated with fertile salts, glide like the chyle and blood in the arteries, &c. of animals.

This moisture, meeting with the new-deposited feed, is percolated or strained through the pores or pipes of the outer rind or husk, answering to the secundines of fœtuses, on the inside whereof lie one or more, commonly two, thick seminal leaves, corresponding to the placenta in women, and the cotyledons in brutes.

The seed-leaves consist of a great number of little vesiculæ or bladders, with a tube corresponding to the navel-strings in animals.

The moisture of the earth, strained through the rind of the seed, is received into these vesiculæ, which causes a slight fermentation with the proper juice before contained therein.

This fermented liquor is conveyed by the umbilical vessel to the trunk of the little plant, and to the gem or bud which is contiguous to it, upon which a vegetation and increase of the plant succeed.

As to the vegetable matter, or the food where the plants grow, there is some doubt. It hath been a general opinion amongst almost all the modern naturalists, that the vegetation of plants, and even of minerals too, is principally owing to water, which not only serves as a vehicle to convey to them the fine rich earth, &c. proper for their nourishment, but being transmuted into the body of the plant, affords the greatest part, if not all the matter with which they are nourished, and by which they grow and increase in bigness. This opinion is countenanced by very great names, particularly by the ingenious Dr. Woodward, who, in order to ascertain this point, made many curious experiments; an account of which may be seen in the Transactions of the Royal Society.

The vegetable matter being very fine and light, is surprisingly apt and disposed to attend water in all its motions, and follow it into each of its recesses, as appears from many instances, percolate it with all the care imaginable, filter it with ever so many filtrations, yet some terrestrial matter will remain.

Dr. Woodward filtered water through several sheets of thick paper, and after that through very close fine cloth, twelve times double, and this over and over; and yet a considerable quantity of this matter discovered itself in the water after all.

Now if it thus passës interstices that are so very small and fine along with the water, it is less strange it should attend it in its passage through the ducts and passages of plants. It is true, filtering and distilling of water interrupts, and makes it quit some of the earthy matter it was before impregnated withal; but then that which continues with the water after this, is fine and light, and such consequently as is in a peculiar manner fit for the growth and nourishment of vegetables.

And this is the case of rain water. The quantity of terrestrial matter it bears up into the atmosphere is not great; but what it doth bear up is chiefly of that light kind, or vegetable matter, and that too perfectly dissolved, and reduced to single corpuscles, all fit to enter the tubes and vessels of plants; on which account it is that this water is so very fertile and prolifick.

Hence it is, that in agriculture, be the earth never so rich, good, and fit for the production of Corn, or other vegetables, little will come of it, unless the particles be separated and loose; and it is on this account such pains are bestowed in the digging, tilling, ploughing, fallowing, harrowing, and breaking the clodded lumps of earth; and it is the same way that sea salt, nitre, and other salts promote vegetation.

It is evident to observation, how apt all sorts of salts are to be wrought upon by moisture, how easily they run with it; and when these are drawn off, and have deserted the

lumps with which they are incorporated, they must moulder immediately, and fall asunder in course.

Lime likewise is in the same way serviceable in this affair. The husbandmen say, it does not fatten, but only mellows the ground; by which they mean, it doth not contain any thing in itself, that is of the same nature with the vegetable mould, or afford any matter fit for the formation of plants, but merely softens and relaxes the earth; by that means rendering it more capable of entering the seeds and vegetables set in it, in order to their nourishment, than otherwise it would have been.

If therefore the soil, wherein any vegetable or seed is planted, contains all or most of the ingredients, and those in due quantity, it will grow and thrive, otherwise it will not. If there be not as many sorts of corpuscles as are requisite for the constitution of the main and more essential parts of the plant, it will not prosper at all. If there are these, and not in sufficient plenty, it will never arrive to its natural stature; or if any of the less necessary and essential corpuscles are wanting, there will be some failure in the plant. It will be defective in smell, taste, colour, and some other way.

Indeed it is inconceivable, how one uniform homogeneous matter, having its principles, or original parts, of the same substance, constitution, magnitude, figure, and gravity, should constitute bodies so unlike in all those respects, as vegetables of different kinds are, nay even as the different parts of the same vegetable; that one should carry a resinous, another a milky, a third a yellow, and a fourth a red juice in its veins; that one affords a fragrant, another an offensive smell; one sweet to the taste, another acid, bitter, acerb, austere, &c. that one should be nourishing, another poisonous; one purging, another astringent; and these all receive their nourishment from the same soil.

But a proof of this matter is, that the soil once proper for the protection of some sort of vegetables, does not ever continue so, but in tract of time loses its property; sooner in some lands, and later in others.

As for example: If Wheat be sown upon land proper for that grain, the first crop will succeed very well, and perhaps the second and third, as long as the ground is in heart, as the farmers call it; but in a few years it will produce no more, if sowed with that Corn; some other grain it may, as Barley; and after this has been sown so oft, that the land can bring no more of it, it may afterward yield some good Oats, and perhaps Peas after them.

At length it becomes barren; the vegetative matter that at first it abounded with, being reduced by the successive crops, and most of it borne off, each sort of grain takes out that peculiar matter that is proper for its own nourishment.

It may be brought to bear another series of the same vegetables, but not till it is supplied with another fund of matter of the like sort with what it first contained, either by the ground's lying fallow for some time, till the rain hath poured a fresh stock upon it, or by the manuring it.

That this supply is of the like sort, is evident by the several manures found best to promote the vegetation, which are chiefly either of parts of vegetables, or of animals; of animals, which either derive their own nourishment immediately from vegetable bodies, or from other animals that do so; in particular, the blood, excrements, and urine of animals that do so; shaving of horns and hoofs, hair, feathers, calcined shells, lees of wine and beer, ashes of all sorts of vegetable bodies, leaves, straw, roots, and stubble, turned into the earth by ploughing, or otherwise, to rot and dissolve there.

These are our best manures, and, being vegetable substances, when refunded back again into the earth, serve for the formation of other bodies.

But to apply this to gardens, where the trees, shrubs, and herbs, after their having continued in one station till they have derived thence the greatest part of the matter fit for their increase, will decay and degenerate, unless either fresh earth, or some fit manure, be applied to them.

It is true they may maintain themselves there for some time, by sending forth roots farther and farther, to an extent all around, to fetch in more provision; but at last they must have a fresh supply brought to them, or they will decay.

All these instances argue a particular terrestrial matter, and not water, for the subject to which plants owe their increase; were it water only, there would be no need of manures, or changing the species; the rain falls in all places, in this field and in that, indifferently, on one side of an orchard or garden, as well as the other; nor could there be any reason, why a tract of land should yield Wheat one year and not the next, since the rain showers down all alike upon the earth.

That the concurrence of heat is really necessary in vegetation, appears from all the experiments, and also from nature, from the fields and forests, gardens and orchards. We see in autumn, as the sun's power is gradually less and less, so its effect on plants is emitted, and vegetation slackens by little and little

Its failure is first discernible in trees, which, being raised highest above the earth, require a more intense heat to elevate the water charged with nourishment to their tops; so that, for want of fresh support and nutriment, they shed their leaves, unless supported by a very firm and hard constitution, as our Ever-greens are. Next, the shrubs part with theirs; then the herbs and lower tribes, the heat at length not being sufficient to supply even to these, though so near the earth, the fund of their nourishment.

As the heat returns the succeeding spring, they all recruit again, and are furnished with fresh supplies and verdure; but first, those which are lowest and nearest the earth, and that require a less degree of heat to raise the water with its earthy charge into them, then the shrubs and higher vegetables in their turn, and lastly the trees.

As the heat increases, it grows too powerful, and hurries the matter with too great rapidity through the finer and more tender plants; these therefore go off and decay, and others, that are more hardy and vigorous, and require a greater degree of heat, succeed in their order. By which mechanism, provident nature furnishes us with a very various and different entertainment, and what is best suited to each season all the year round.

As the heat of the several seasons affords us a different face of things, the several distant climates shew the different scenes of nature, and productions of the earth.

The hotter countries ordinarily yield the largest and tallest trees, and those too in a much greater variety than the colder; even those plants common to both, attain to a much greater bulk in the southern than in the northern climates.

Nay, there are some regions so cold, that they raise no vegetables at all to a considerable size; this we learn from *Greenland*, *Iceland*, and other parts of like cold situation and condition: in these there are no trees, and the shrubs are poor, little, and low.

Again, in the warmer climates, and such as furnish trees and the large vegetables, if there happen a remission or diminution of the usual heat, their productions are impeded in proportion. Our own summers give us proof enough of this, for though at such times there is heat sufficient to raise the vegetative matter into the lower plants, as Wheat, Barley, Peas, and the like, and we have plenty of Strawberries, Raspberries, Gooseberries, Currants, and the fruits

of such vegetables as are low, and near the earth, and a moderate store of Cherries, Plumbs, &c. and some others, that grow at something of a greater height, yet our Apples, Pears, Peaches, Nectarines, and Grapes, and the production of warmer countries, have been fewer, and those not so thoroughly ripened and brought to perfection, as they are in more benign seasons.

Nor is it that heat only which promotes vegetation, but any other indifferently, according to its power and degree, as we find from our stoves, hot-beds, &c.

And by the rightly adapting of these artificial heats, the *English* gardeners have of late years so much improved their art, as in a great measure to supply the want of natural heat, and to vie with the people who inhabit countries several degrees south of *England*, in the early products of esculent plants, and the accelerating and ripening the fruits of the warmest climates. And as the knowledge of vegetation is improved, and the practitioners of the art are better acquainted with the theory, it may be hoped the art may be farther extended and improved; therefore it is highly necessary, that the theory of vegetation should be studied by every person who proposes to make any proficiency in gardening and agriculture.

VELLA. *Lin. Gen. Plant.* 714. *Spanish* Cresfs.

The Characters are,

The empalement of the flower is cylindrical, and composed of four linear obtuse leaves, which drop off. The flower has four petals, placed in form of a cross, whose tails are the length of the empalement, and six stamina of the same length, two of which are a little shorter, terminated by single summits, and an oval germen, supporting a conical style, crowned by a single stigma. The germen afterward turns to a globular capsule with two cells, divided by an intermediate partition twice as large as the pod, oval, erect, stretching beyond the capsule, each cell containing one seed.

The Species are,

1. VELLA *foliis pinnatifidis, siliculis pendulis.* *Lin. Sp. Plant.* 641. Vella with wing-pointed leaves, and hanging pods.

2. VELLA *foliis integris siliculis erectis.* *Lin. Sp. Plant.* 641. Vella with entire leaves, and erect pods.

The first sort grows naturally in *Valencia*; it is an annual plant, which seldom rises more than one foot high. The stalk divides toward the top into several branches, each ending in a loose spike of flowers, which are followed by round swelling pods, having a leafy border or crest on the top, which is hollowed like a helmet. The pod opens with two valves, and has two cells, which contain roundish seeds like those of Mustard. The leaves are jagged, and end in many points.

This plant is preserved in botanick gardens for variety, but as it is not very beautiful, nor of use, it is seldom cultivated in other gardens. If the seeds are permitted to scatter, the plants will come up and thrive very well; or if they are sown in autumn, they will succeed much better than those which are sown in the spring; for when the season proves dry, those seeds which are sown in the spring frequently lie in the ground till the following autumn, before the plants appear; whereas those which are sown in autumn, always come up soon after, or early in the spring, so will more certainly produce ripe seeds. The seeds should be sown where the plants are to remain, and if they are kept clean from weeds, and thinned where they are too close, they will require no other culture.

The second sort grows naturally in *Spain*. The leaves of this are entire, hairy, and sit close to the stalk; they are of a grayish colour. The stalks become ligneous, and rise about two feet high, terminated by roundish bunches of pale yellow flowers, which stretch out in length; the flowers have four cross-shaped petals, and are succeeded by

pods like the former. This plant will continue two or three years; it is propagated by seeds in the same manner as the former.

VERATRUM. *Tourn. Inst. R. H. 272. tab. 145.* White Hellebore.

The Characters are,

It has hermaphrodite and male flowers intermixed in the same spike. The flowers have no empalement; they have six oblong spear-shaped petals, which are permanent, and six awl-shaped stamina sitting on the point of the germen, spreading asunder, terminated by quadrangular summits; they have three oblong erect germen sitting upon the style, which are scarce visible, crowned by a single spreading stigma. The germen afterward becomes three oblong, erect, compressed capsules with one cell, opening on the inside, including many oblong, compressed, membranaceous seeds. The male flowers have the same characters of the hermaphrodite, but are barren.

The Species are,

1. VERATRUM *racemo supradecomposito, corollis erectis.* *Lin. Sp. Plant. 1044.* White Hellebore with a decomposed spike, and erect petals; or White Hellebore with a greenish flower.

2. VERATRUM *racemo composito, corollis patentissimis.* *Lin. Sp. Plant. 1044.* White Hellebore with a compound spike, and very spreading petals; or White Hellebore with a dark red flower.

3. VERATRUM *racemo simplicissimo, foliis sessilibus.* *Lin. Sp. Plant. 1044.* White Hellebore with a single spike, and leaves fitting close to the stalk.

4. VERATRUM *racemo simplicissimo, corollis patentibus, staminibus longioribus.* White Hellebore with a single spike of flowers, spreading petals, and longer stamina.

The first sort grows naturally on the mountains in *Austria, Helvetia, and Greece.* The root is perennial, composed of many thick fibres gathered into a head; the leaves are ten inches long, and five broad in the middle, rounded at the points, having many longitudinal plaits like those of Gentian; the stalks rise three or four feet high, and branch out on every side almost their whole length; under each of these branches is placed a narrow plaited leaf, which diminishes in its size as it is nearer the top of the stalk. The branches and principal stalk are terminated by spikes of flowers set very close together, which are composed of six green erect petals; in their center is situated three obtuse germen. From the point of these arise six stamina, which spread asunder, terminated by four-cornered summits. These are succeeded by oblong compressed capsules with one cell, filled with membranaceous seeds.

The second sort grows naturally in *Hungary and Siberia;* it has a perennial root like the former. The leaves are longer and thinner than those of the first sort; they are plaited in the like manner, but are of a yellowish green colour, and appear sooner in the spring; the stalks rise higher than those of the former. It has fewer leaves upon it, and does not branch into so many spikes. The flowers of this are of a dark red colour, and the petals spread open flat, in which it differs from the former.

The third sort grows naturally in *Virginia,* and other parts of *North America,* where it is sometimes called Rattle-snake Root. The root of this is tuberous; the leaves are oblong, and shaped like those of Plantain, having several longitudinal furrows or plaits, spreading themselves on the ground. Between these come out a single stalk which rises near a foot high, having a few very small leaves or sheaths, placed alternately; and at the top the flowers are produced in a single, thick, close spike; they are small, and of a yellowish white colour, but are rarely succeeded by seeds here.

The fourth sort was sent me from *Philadelphia* by Mr. *John Bartram,* who found it growing naturally in that coun-

try: The root of this is composed of thick fleshy fibres; the leaves are oblong, oval, of a light green colour, having six longitudinal veins or plaits, spreading on the ground, rounded at their points, and continue all the year. In the center of the leaves springs up a single erect stalk a foot high, having a few vestiges, or small leaves, standing alternately close to the stalk, which end in acute points. The stalk is terminated by a thick obtuse spike of dark red flowers, whose petals spread open flat. In the center of the petals is situated three obtuse germen joined together, from whose point arises six stamina, which spread asunder, and are longer than the petals; these are terminated by four-cornered summits, of a purple colour. This plant flowers the latter end of *June,* and in warm seasons the seeds will ripen here.

The first of these plants is that which is ordered for medicinal use, and is by much the stronger and more acid plant of the two; for when both sorts are placed near each other, the snails will entirely devour the leaves of the second sort, when at the same time they scarcely touch those of the first.

The plants are also very pretty ornaments, when planted in the middle of open borders of the pleasure garden; for if they are placed near hedges or walls, where snails generally harbour, they will greatly deface the leaves, especially of the second sort, by eating them full of holes before they are unfolded; and as a great part of the beauty of these plants is in their broad-folded leaves, so, when they are thus defaced, the plants make but an indifferent appearance.

Both these sorts may be propagated by parting their roots in autumn, when their leaves decay; but they should not be parted too small, for that will prevent their flowering the following summer; these heads should be planted in a light fresh soil, in which they will thrive exceedingly, and produce strong spikes of flowers. The roots should not be removed oftener than once in four or five years, by which time (if they like the soil) they will be very strong, and produce many heads to be taken off; but if they are frequently transplanted, it will prevent their increasing, and cause them to flower very weak.

They may also be propagated by seeds, which should be sown as soon as ripe, either in a bed or box, filled with fresh light earth. In the spring the plants will appear, at which time, if the season proves dry, you should now and then refresh them with water, which will greatly promote their growth; you must carefully clear them from weeds, which, if permitted to grow, will soon overspread and destroy these plants while young. The autumn following, when their leaves decay, you should prepare a bed of fresh light earth; then carefully take up the young plants (observing not to break their roots), and plant them therein about six inches square, where they may remain until they are strong enough to flower, when they should be transplanted into the borders of the pleasure-garden; but, as these plants seldom flower in less than four years from seeds, this method of propagating them is not much practised.

The two *American* sorts are at present scarce in the *English* gardens, but, as they are hardy enough to thrive in the open air, in a few years they may be more plenty; these may be propagated by offsets or seeds, in the same manner as the former.

VERBASCUM. *Tourn. Inst. R. H. 146. tab. 161.* Mullein.

The Characters are,

The flower has a small permanent empalement of one leaf, cut into five parts; it hath one wheel-shaped petal, with a very short cylindrical tube, the brim cut into five oval obtuse segments, and five awl shaped stamina, which are shorter than the petal, terminated by roundish, compressed, erect summits, with a roundish germen, supporting a slender style inclining to the stamina, crowned by

by a thick obtuse stigma. The germen afterward becomes a roundish capsule with two cells, opening at the top, having on half oval receptacle fixed to the partition, filled with angular seeds.

The Species are,

1. *VERBASCUM foliis decurrentibus utrinque tomentosis. Vir. Cliff. 13.* Mullein with running leaves, which are woolly on both sides; or white Mullein, Hig-taper, or Cows-lungwort.

2. *VERBASCUM foliis cuneiformi-oblongis. Hort. Upsal. 45.* Mullein with oblong wedge-shaped leaves.

3. *VERBASCUM foliis cordato-oblongis, subtus incanis, spicis racemosis.* Mullein with oblong heart-shaped leaves which are hoary on their under side, and branching spikes of flowers; or Female Mullein.

4. *VERBASCUM foliis radicalibus ovatis petiolatis, caulinis oblongis sessilibus subtus tomentosis serratis.* Mullein with oval lower leaves growing on foot-stalks, but those on the stalks oblong, sawed, woolly on their under side, and sitting close.

5. *VERBASCUM foliis ovato-acutis utrinque tomentosis, floribus in spicâ densissimâ sessilibus. Haller. Helvet. 507.* Mullein with oval acute-pointed leaves which are woolly on both sides, and flowers disposed in thick spikes sitting close to the stalk; or Female Mullein with a large yellow flower.

6. *VERBASCUM foliis serratis supernè rugosis, infernè subhirsutis, petiolis ramosis, staminum barbâ purpurascente. Haller. Helvet. 511.* Mullein with sawed leaves whose upper sides are rough, those on the under side hairy, branching foot-stalks, and purplish beards to the stamina; commonly called Sage-leaved black Mullein.

7. *VERBASCUM foliis radicalibus oblongis sinuatis undatis tomentosis, caulinis cordatis amplexicaulibus nudiusculis. Lin. Sp. Plant. 178.* Mullein with the lower leaves oblong, sinuated, woolly, waved, and those on the stalks heart-shaped, embracing the stalks with their base, and almost naked; or black Mullein with a horned Poppy leaf.

8. *VERBASCUM foliis amplexicaulibus oblongis glabris, pedunculis solitariis. Hort. Upsal. 46.* Mullein with oblong smooth leaves embracing the stalks, and single foot-stalks to the flowers; or white Moth Mullein.

9. *VERBASCUM foliis radicalibus pinnato-sinuatis, caulinis dentatis acuminatis semi-amplexicaulibus, pedunculis solitariis.* Mullein with the lower leaves jagged like wings, those on the stalks acute-pointed, indented, and half embracing the stalks, and single foot-stalks to the flowers; yellow Moth Mullein.

10. *VERBASCUM foliis ovato-oblongis obsolete crenatis, utrinque virentibus petiolatis, caule ramoso.* Mullein with oblong oval leaves having obsolete crenatures, and both sides green, with a branching stalk; or Moth Mullein with an iron-coloured flower.

11. *VERBASCUM foliis radicalibus oblongis integerrimis, utrinque viridibus, caulinis acutis sessilibus, pedunculis aggregatis.* Mullein with oblong, entire, lower leaves which are green on both sides, those on the stalks acute-pointed, sitting close, and clustered foot-stalks.

12. *VERBASCUM foliis ovatis nudis crenatis radicalibus, caule subnudo racemoso. Lin. Sp. Plant. 178.* Mullein with naked, oval, crenated, lower leaves, and an almost naked branching stalk; or purple Moth Mullein.

13. *VERBASCUM foliis lanatis radicalibus, scapo undo. Lin. Sp. Plant. 179.* Mullein with woolly lower leaves, and a naked stalk; commonly called Borage-leaved Auricula.

The first is the common Mullein or Hig-taper which is used in medicine, which grows naturally by the side of highways and on banks in many parts of England; it is a biennial plant, which perishes soon after it has perfected seeds. The lower leaves, which spread on the ground, are long and broad, very woolly, and of a yellowish white co-

lour, having scarce any foot-stalks. The stalk rises four or five feet high, the lower part is garnished with leaves, shaped like those below but smaller, whose base half embraces the stalk, and have wings running along the stalk. The upper part is closely garnished with yellow flowers, sitting very close, formed into a long thick spike, composed of five obtuse roundish petals, having five stamina in the center, of an agreeable odour.

The second sort grows naturally in some parts of England; I have observed it in plenty in some parts of Nottinghamshire: this is also a biennial plant. The lower leaves are oblong, indented on their edges, ending in acute points. The stalk rises three or four feet high, sending out from every joint short spikes of small yellow flowers, which are paler than those of the first, and have a pleasanter odour. At the base of each spike is situated a small, oblong, acute-pointed leaf, covered with a white powder which washes off. When the flowers decay, they are succeeded by oval capsules, filled with small seeds, which ripen in autumn.

The third sort grows naturally in Italy and Spain. The lower leaves of this are broad, rough on their upper side, and a little hoary; their under side is pale and woolly. The stalk rises six or seven feet high, sending out some erect side branches; the flowers are disposed in long branching spikes; they are white, having the most agreeable scent of all the species.

The fourth sort has oval leaves, standing upon thick foot-stalks; they are of a soft texture, of a pale green on their upper side, but hoary on their under. The stalk rises three or four feet high; the upper part is garnished with smaller leaves of the same shape with those below; the upper part of the stalk is garnished with pale yellow flowers, disposed in a loose spike, having small leaves intermixed with the flowers.

The fifth sort has oval leaves which terminate in a point; they are of a yellowish green colour, and woolly on both sides. The stalks rise about four feet high; they are of a purplish colour, covered with a hoary down. The flowers sit very close to the stalk, forming a very thick spike, having no leaves between them; they are much larger than those of the first sort, and are of a deeper yellow colour.

The sixth sort grows naturally in several parts of England. The lower leaves of this are spear-shaped, and rounded at the foot-stalk, where they are indented like a heart; they are of a pale green on their upper side, and hoary on their under, indented on their edges; those upon the stalk are oblong, acute-pointed, and sawed. The stalks rise three or four feet high, the upper part ending in a long spike of yellow flowers, which stand in short spikes or clusters; these have purplish stamina which are bearded; they have an agreeable odour at a small distance, but, when smelt too near, become less agreeable.

The seventh sort grows naturally in Italy, Greece, and also upon the rocks at Gibraltar. The lower leaves are oblong, sinuated on their borders, waved and hoary. The stalk rises four or five feet high, sending out many slender branches, garnished with heart-shaped leaves whose base embrace the stalk; the upper part of the stalk and branches have no leaves, but the flowers are disposed in small clusters at distances; they are small, yellow, and have little odour.

The eighth sort grows naturally in the south of France and Italy. The leaves of this are oblong, smooth, and of a dark green colour; the stalk rises three or four feet high, sending out two or three side branches, garnished with oblong, smooth, green leaves, whose base embrace the stalk. The flowers come out singly from the side of the stalk, upon foot-stalks an inch long; they have one petal cut into five obtuse segments almost to the bottom; they are white within, and have a little blush of red on the outside: the seed-

seed-vessels of this sort are round, and filled with small seeds.

The ninth sort grows naturally in some parts of *England*; this differs from the former, in the lower leaves being much longer, and deeply sinuated on their edges in a regular manner, in imitation of the rangement of the lobes of winged leaves; they are of a brighter green colour than those of the former. The stalks rise much taller; the flowers are of a bright yellow colour, and the stamina, which are hairy, are of a purple colour.

The tenth sort is commonly cultivated in gardens, and is known by the title of iron-coloured Moth-Mullein; this has a perennial root, in which it differs from all the former sorts, though there are some who suppose it to be only a variety of the last mentioned, but it differs greatly from that in other respects. The bottom leaves are oblong, oval, crenated on their edges, but entire; they are of a dark green on their upper side, of a pale green on their under, standing upon pretty long foot-stalks. The stalk rises three or four feet high, branching out on each side, and has a few sharp-pointed small leaves on the lower part sitting close to the stalk. The flowers are disposed in a long loose spike on the upper part of the stalk, having short slender foot-stalks; they are of one petal, cut almost to the bottom into five obtuse segments, of a rusty iron colour, and are larger than those of the common sort. This plant does not produce seeds here.

The eleventh sort grows naturally in *Sicily*; this is a biennial plant, which perishes soon after the seeds are ripe. The lower leaves are long, rounded at their points, are entire, and of a deep green on both sides. The stalk is strong, and rises five or six feet high, garnished with small acute-pointed green leaves, whose base fits close to it. The flowers form a very long loose spike at the top, coming out in clusters from the side of the stalk; they are large, of a deep yellow colour, and are succeeded by large round capsules which are brown, opening in two parts, filled with small dark-coloured seeds.

The twelfth sort grows naturally in *Spain* and *Portugal*. The root of this is perennial; the leaves are oval, entire, of a light green colour, and a little hairy; the stalk rises three feet high, and is almost naked of leaves, but the flowers, which come out singly, are ranged along it almost the whole length, standing upon short foot-stalks. They are of a dark blue inclining to purple; these appear in *June* and *July*, but are not succeeded by seeds here.

The thirteenth sort grows naturally upon the *Alps* and *Pyrenean* mountains; it is a very humble plant, whose leaves spread on the ground. The roots are composed of slender fibres; the leaves are oval, thick, fleshy, and hairy, crenated on their edges, and have compressed hairy foot-stalks. Between them arise slender naked foot-stalks about four inches long, which divide into three or four small ones at the top, each sustaining one large blue flower, composed of five oval petals which spread open flat, and five thick erect stamina which stand erect. After the flowers are past, the germen turns to an oblong-pointed capsule which opens in two parts, and is filled with small seeds.

The root of this is perennial, and the plant is usually propagated by off-sets which come out from the side of the old plant; these should be taken off in autumn, and planted in small pots filled with light sandy earth; they must always have a shady situation, for they will not thrive when they are exposed to the sun.

The first nine and the eleventh sorts are biennial plants; these may be all cultivated by sowing their seeds in *August*, on a bed of light earth, in an open situation, where the plants will come up the succeeding spring. In spring the plants should be transplanted where they are to remain, al-

lowing them a great distance, for as they grow large, they must not be planted nearer than two feet from other plants. The following year they will flower, and their seeds will be ripe in *August* or *September*. Notwithstanding some of these plants grow wild in *England*, yet two or three of each kind may be admitted into large gardens, for the variety of their hoary leaves, together with the extreme sweetness of their flowers, which have a scent something like *Violets*; and, as they require little care, they may be allowed a place in the borders of large gardens, where, during their continuance in flower, they will add to the variety; and, if their seeds are permitted to scatter, will come up without care, but the seventh sort seldom produces good seeds in *England*.

The tenth and twelfth sorts have perennial roots, and as they do not produce good seeds here, they are propagated by off-sets, which should be taken off in autumn, time enough to get good root before winter, otherwise they will not flower the following summer. These plants thrive best in a sandy loam, and should be planted on an east border, where they may have only the morning sun, for they do not thrive well when they are too much exposed to the sun.

VERBENA. *Tourn. Inst. R. H.* 200. tab. 94. Vervain.

The Characters are,

The flower has an angular, permanent empalement, indented in five parts at the brim; it has one petal, with a cylindrical tube the length of the empalement, cut into five points at the brim, which spread open, and are nearly equal; it has sometimes two, at others four very short bristly stamina within the tube, two of which are shorter than the other, with as many incurved summits as stamina, with a four-cornered germen, supporting a slender style the length of the tube, crowned with an obtuse stigma. The germen afterward become two or four oblong seeds, closely shut up in the empalement.

The Species are,

1. VERBENA *tetrandra*, spicis filiformibus paniculatis foliis multifido-laciniatis, caule solitario. *Lin. Sp. Plant.* 20. Vervain with four stamina, slender spikes disposed in panicles, leaves having many-pointed jags, and a single stalk. This is the common Vervain.

2. VERBENA *tetrandra*, spicis longis acuminatis, foliis hastatis. *Hort. Upsal.* 8. Vervain with four stamina to the flowers, long acute pointed spikes, and halbert shaped leaves.

3. VERBENA *tetrandra*, spicis filiformibus solitariis, foliis bipinnatifidis. *Lin. Sp. Plant.* 21. Vervain with four stamina to the flowers, single slender spikes, and double wing-pointed leaves; or narrow-leaved Vervain.

4. VERBENA *tetrandra*, spicis filiformibus paniculatis, foliis indivisis serratis petiolatis. *Hort. Upsal.* 9. Vervain with four stamina to the flowers, slender spikes growing in panicles, and undivided sawed leaves having foot-stalks; *Canada* Vervain.

5. VERBENA *tetrandra*, spicis filiformibus, foliis multifido laciniatis, caulibus numerosis. *Hort. Upsal.* 8. Vervain with four stamina to the flowers, slender spikes, leaves with many jagged points, and numerous stalks; *Nettle* leaved Vervain of *Canada*.

6. VERBENA *tetrandra*, spicis fasciculatis, foliis lanceolatis amplexicaulibus. *Hort. Upsal.* 8. Vervain with four stamina to the flower, spikes disposed in bunches, and spear-shaped leaves embracing the stalks; tallest Vervain of *Buenos Ayres*.

7. VERBENA *tetrandra*, spicis filiformibus paniculatis, foliis inferne cordato oblongis caulibus lanceolatis serratis petiolatis. Vervain with four stamina to the flowers, slender spikes growing in panicles, the under leaves oblong and heart-shaped, and those on the stalks spear-shaped, sawed, having foot-stalks.

8. VERBENA *tetrandra*, spicis capitato-conicis, foliis serratis, caule repente. *Flor. Zeyl.* 399. Vervain with four stamina to

the flowers, spikes growing in conical heads, sawed leaves, and a creeping stalk.

9. *VERBENA diandra, spicis longissimis carnosis subnudis.* *Lin. Sp. Plant.* 19. Vervain with two stamina to the flowers, and very long fleshy spikes which are almost naked.

10. *VERBENA diandra, spicis carnosis subnudis, foliis ovatis obtusis, obsolete crenatis petiolatis.* Vervain with two stamina to the flowers, fleshy spikes which are almost naked, and oval obtuse leaves growing upon foot-stalks, having slight indentures.

11. *VERBENA diandra, spicis longissimis foliolis.* *Lin. Sp. Plant.* 18. Vervain with two stamina to the flowers, and the longest leafy spikes.

12. *VERBENA diandra, spicis brevioribus, foliis ovatis serratis, subtus incanis.* Vervain with two stamina to the flowers, shorter spikes, and oval sawed leaves, which are hoary on their under side.

13. *VERBENA diandra spicis ovatis, foliis lanceolatis serratoplicatis, caule fruticoso.* *Prod. Leyd.* 327. Vervain with two stamina to the flowers, oval spikes and spear-shaped leaves, which are plaited, and a shrubby stalk.

14. *VERBENA diandra, spicis rotundis, foliis ovatis serratis, caule fruticoso ramoso.* Vervain with two stamina to the flowers, round spikes, oval sawed leaves, and a shrubby branching stalk.

15. *VERBENA diandra, spicis carnosis subnudis, foliis lineari-lanceolatis obsolete serratis.* Vervain with two stamina to the flowers, naked fleshy spikes, and narrow spear-shaped leaves, slightly sawed on their edges.

16. *VERBENA diandra, spicis laxis, calycibus fructibus reflexo-pendulis subglobosis hispidis.* *Lin. Sp. Plant.* 19. Vervain with two stamina to the flowers, loose spikes, the empalement of the fruit almost globular, prickly, and reflexed downward.

17. *VERBENA diandra, spicis laxis, calycibus aristatis, foliis ovatis argute serratis.* *Lin. Sp. Plant.* 19. Vervain with two stamina to the flowers, loose spikes, bearded empalements, and oval leaves which are sharply sawed.

18. *VERBENA diandra, spicis ovatis, foliis subrotundis serratis & rugosis, caule fruticoso ramoso.* Vervain with two stamina to the flowers, oval spikes, roundish, sawed, rough leaves, and a shrubby branching stalk.

The first is very common on the side of roads, foot-paths, and farm-yards near habitations; for although there is scarce any part of *England*, in which this is not found in plenty, yet it is never found above a quarter of a mile from a house; which occasioned its being called *Simpler's Joy*, because wherever this plant is found growing, it is a sure token of a house being near; this is a certain fact, but not easy to be accounted for. It is rarely cultivated in gardens, but is the sort directed by the College of Physicians for medicinal use; and is brought to the markets by those who gather it in the fields.

There is another species which approaches near to this, but is taller, the leaves are broader, and the flowers larger. It came from *Portugal*, and is by *Tournefort* titled *Verbena Lusitanica, latifolia procerior.* *Inst. R. H.* 200. Taller, broad-leaved *Portugal* Vervain. But I am in some doubt of its being specifically different from the common sort, though the plants in the garden grow much taller, branch more, and the flowers are larger than the first, yet as there is so near an affinity, I cannot be sure it is a different species.

The second sort grows naturally in most parts of *North America*; this sends up many four-cornered furrowed stalks from the root, which rise five or six feet high, garnished with oblong leaves, ending in acute points, deeply sawed on their edges, and stand upon slender foot-stalks; from the joints come out short branches, set with smaller leaves of the same form. The stalks are terminated by spikes of blue flowers in clusters, which appear in *August*, and if the autumn proves favourable, the seeds will ripen the middle of *October*.

The third sort grows naturally in *Spain* and *Portugal*; this is a biennial plant, which perishes soon after the seeds are ripe. The stalks branch much, rise near two feet high. The leaves are double wing-pointed, and sit close to the stalks. The flowers are disposed in loose spikes, of a light blue colour, and larger than those of the common sort.

The fourth sort grows naturally in most parts of *North America*; this is a biennial plant. The stalks are four-cornered, about three feet high. The leaves are long, ending in acute points, and sawed on their edges. The stalks are terminated by panicles of spikes, which are long, slender, and sustain small white flowers, which are ranged loosely, and are succeeded by seeds which ripen in autumn.

The fifth sort also grows naturally in *North America*; this is a biennial plant, whose lower leaves are long, deeply jagged, and sawed on their edges, of a deep green colour.

The stalks rise two feet high, garnished with small leaves of the same shape. The upper part of the stalk branches out into numerous foot-stalks, which sustain panicles of spiked blue flowers, and if the season proves favourable, the seeds will ripen in autumn.

The sixth sort grows naturally at *Buenos Ayres*; this has four-cornered stalks, which rise six or seven feet high, branching from the side, garnished with long spear-shaped leaves, whose base embrace the stalks, of a pale green colour. The stalks are terminated by spikes of blue flowers, which are clustered together. These appear late in summer, so do not always produce good seeds in *England* in the open air.

The seventh sort grows naturally at *Philadelphia*. The seeds were sent me by *Dr. Bensef*; this is a perennial plant. The lower leaves are heart-shaped, rough, of a dark green colour, are sawed on their edges, ending in acute points. The stalks rise six feet high, branch toward the top, and are terminated by slender spikes of white flowers, formed into panicles; these appear late in autumn, so that unless the season proves favourable, the seeds do not ripen here.

The eighth sort grows naturally in *Virginia*, and also in *Jamaica*. The stalks of this trail upon the ground, and emit roots from their joints, whereby they spread, and propagate greatly, and from these arise other branches about eight or nine inches high, garnished with oval spear-shaped leaves, sawed on their edges, and sit close to the stalks. The flowers are collected in conical heads, standing upon naked foot-stalks, which spring from the wings of the branches; they are of a yellowish white colour, and come late in autumn, so are rarely succeeded by good seeds here.

The ninth sort grows naturally in most of the islands in the *West-Indies*; it is an annual plant. The stalk rises a foot and a half high, garnished with oblong oval leaves placed opposite, of a light green, and sawed on their edges. The stalk is terminated by a long fleshy spike of blue flowers, which are succeeded by two oblong seeds ripening late in autumn. The spikes of flowers are from a foot to a foot and a half in length.

The seeds of the tenth sort were sent me from *Panama*, where it grows naturally in moist places; this is an annual plant, whose stalks rise a foot high, garnished with oval, blunt-pointed, fleshy leaves, standing upon long foot-stalks; they are notched slightly on their edges, and are of a light green. The stalks are terminated by thick spikes of blue flowers, which appear late in autumn, so that unless the season proves warm, the seeds do not ripen in *England*.

The seeds of the eleventh sort were also sent me from *Panama*; this rises with a shrubby stalk three feet high, which divides into three or four branches, garnished with oblong oval leaves placed opposite, of a deep green on their upper side, but hoary on their under, and are deeply sawed; their foot-stalks are short, and have leafy borders running from

from the base of the leaves. The flowers grow on thick spikes a foot long, which terminate the branches. They are large, and of a fine blue colour, so make a good appearance, and have small acute-pointed leaves intermixed with them on the spikes. This plant, when the season is warm, will perfect seeds in autumn.

The seeds of the twelfth sort were sent me from *Paris*, and were said to come from *Senegal* in *Africa*; this is a perennial plant with a branching stalk, two feet high, garnished with oval sawed leaves placed opposite; of a deep green on their upper side, but hoary on their under. The flowers are disposed in fleshy spikes at the end of the branches, which are shorter, and not so thick as those of the former sorts. The flowers are small, white, so make but little appearance; the seeds ripen in autumn, but the plants may be preserved two years in a warm stove.

The thirteenth sort grows naturally in *Jamaica*, and in several other places in the *West Indies*. This rises with a shrubby branching stalk five or six feet high, adorned with spear-shaped leaves, sawed on their edges, standing upon short foot-stalks. The flowers have long naked foot-stalks, which arise from the wings of the stalk; they are blue, and collected in oval heads; these appear late in autumn, so unless the season proves warm, the seeds do rarely ripen in *England*, but the plants may be kept two or three years in a warm stove.

The fourteenth sort grows naturally at *Campeachy*; this has a shrubby branching stalk four feet high, garnished with oval sawed leaves, of a light green colour. The flowers are of a pale blue, collected into oval heads, which stand upon long naked foot-stalks, springing from the wings of the branches; this flowers late in autumn, so is not succeeded by seeds in *England*.

The fifteenth sort grows naturally at *La Vera Cruz*; this is an annual plant with a branching stalk a foot and a half high, garnished with pale green leaves, ending in acute points, slightly sawed on their edges. The branches are terminated by fleshy spikes of blue flowers which are naked, and in warm seasons are succeeded by seeds which ripen in autumn.

The sixteenth sort grows naturally in *Mexico*; this has a shrubby stalk which rises five or six feet high, dividing into several branches, garnished with oblong sawed leaves which end in acute points, sitting close to the branches, of a light green on both sides. The branches are terminated by slender loose spikes of pale flowers which are very small, whose empalements afterward become swelled, and almost globular; they are reflexed downward, and set with stinging hairs. It flowers late in the summer, and in good years the seeds ripen in *England*.

The seventeenth sort grows naturally at *La Vera Cruz*; this has a slender ligneous stalk, which branches and rises near three feet high, adorned with small oval leaves of a light green, which are sharply indented on their edges. The flowers stand sparsely upon slender foot-stalks, arising from the wings of the branches; toward the top, the flowers are ranged at a distance from each other in a loose spike; they are small, and of a bright blue colour, sitting very close; these are succeeded by two seeds inclosed in the empalement, which is terminated by short awns or beards.

The eighteenth sort grows naturally at *Campeachy*; this has a strong woody stalk ten or twelve feet high, covered with a light brown bark, sending out many ligneous branches, garnished with roundish, sawed, rough leaves, of a light green, standing upon short foot-stalks. The flowers are small, of a pale blue colour, collected into oval heads, standing upon naked foot-stalks; these seldom appear in this country, and are not succeeded by seeds here; but the plants are easily propagated by cuttings during the summer months, so may be preserved many years in a moderate stove.

The first sort, as was before observed, being a common weed in *England*, is not kept in gardens.

The third sort may be easily propagated by seeds which should be sown in autumn, and requires no other culture than to keep it clean from weeds, and thin the plants where they are too close.

The fourth and fifth sorts may also be propagated in the same manner, and are equally hardy. If the seeds are permitted to scatter, the plants will come up the following spring.

The second and seventh sorts have perennial roots, and are hardy enough to thrive in the open air; these may be propagated by seeds, which should be sown in autumn, for when they are sown in the spring, they rarely grow the same year; the plants require no other culture but to keep them clean from weeds, and allow them proper room to spread; they may also be propagated by parting their roots in autumn. They love a soft loamy soil not too dry.

The other sorts being natives of warmer climates require more care. The seeds of these should be sown upon a hot-bed early in the spring, and when the plants are fit to remove, they should be each transplanted into a separate small pot, and plunged into a fresh hot-bed to bring them forward; they must be shaded in the day time with mats until they have taken new root, then they must be treated in the same way as other tender plants from the same countries.

Those sorts which are annual must be removed into the stove, or a good glass-case, when they are become too tall to remain longer under the frames; for if they are placed abroad in the open air, they will not ripen their seeds here unless the summer is very warm; therefore where there is a conveniency of having a bark-bed in a glass-case, for plunging some of these tender annual plants, they will thrive much better, and come to greater perfection, than those which are placed on shelves.

The seventeenth sort is by much the tenderest plant of all the species, and is very difficult to preserve when young. The seeds of this should be sown in a small pot, and plunged into a good hot-bed of tanners bark. When the plants appear, they should be shaded from the sun in the heat of the day. They must also be frequently refreshed with water, but it must be given to them sparingly, for much wet will kill them. When they are transplanted into small pots they must be carefully shaded till they have taken new root, and they must be constantly kept in the bark-bed.

VERBESINA. *Lin. Gen. Plant.* 873. Indian Hemp Agrimony.

The Characters are,

The common empalement of the flower is composed of a double order of leaves which are channelled. The flower is made up of hermaphrodite florets in the disk, and female half florets in the border. The hermaphrodite florets are funnel-shaped; they have five very short hair-like stamina, terminated by cylindrical summits, and a germen the same figure as the seed, supporting a slender style, crowned by two reflexed stigmas. The germen afterward becomes a thick angular seed crowned by a few three-pointed chaff.

The Species are,

1. VERBESINA *foliis alternis decurrentibus undulatis obtusis. Hort. Cliff.* 411. Verbessina with alternate running leaves, which are obtuse and waved.

2. VERBESINA *foliis oppositis lanceolatis serratis. Hort. Cliff.* 500. Verbessina with spear-shaped sawed leaves which are placed opposite.

3. VERBESINA *foliis oppositis ovatis trinerviis glabris petiolatis, seminibus tricornuis. Flor. Zeyl.* 310. Verbessina with oval leaves having three veins, placed opposite on foot-stalks, and seeds with three horns.

4. VERBESINA *foliis oppositis lanceolatis integerrimis, caulibus procumbentibus, floribus sessilibus.* Verbessina with spear-shaped

shaped entire leaves, which are placed opposite, trailing stalks, and flowers fitting close to the branches.

5. *VERBESINA foliis oppositis lanceolatis argutè dentatis, caule ramoso piloso.* Verbesina with spear-shaped, acutely indented leaves placed opposite, and an erect, branching, hairy stalk.

6. *VERBESINA foliis oppositis lanceolato-ovatis petiolatis serratis, pedunculis unifloris dichotomice caulis.* Flor. Zeyl. Verbesina with oval, spear-shaped, sawed leaves, placed opposite, and single flowers upon each foot stalk, produced from the divisions of the stalk.

The first sort grows naturally in most of the islands of the *West Indies*; it is an annual plant, with an upright winged stalk about two feet high, from the sides of which spring out toward the top a few short branches. The leaves are oval, blunt, and waved on their edges; they are placed alternate, and from the base of each leaf is extended a leafy border, running along two sides of the stalk. The flowers stand upon long naked foot-stalks, arising from the top and the wings of the stalk; they are of a deep Orange colour, and are composed of hermaphrodite and female florets, included in one common spherical empalement, which are both fruitful; these are succeeded by broad, compressed, bordered seeds, with two teeth, which ripen in the empalement.

The second sort grows naturally in the *West-Indies*; this has an upright branching stalk a foot and a half high. The leaves are spear-shaped, a little sawed on their edges, fitting close to the stalk opposite. The flowers arise from the wings of the stalk upon slender foot-stalks, three, four, or more springing from the same joint; each of these sustain one white radiated flower, composed of many florets, which are succeeded by oblong black seeds.

The third sort grows naturally in both *Indies*; this rises with an upright branching stalk two or three feet high. The leaves are oval, acute-pointed, and smooth, having three longitudinal veins; they stand opposite upon pretty long foot-stalks. The flowers spring from the wings and ends of the branches; they are yellow, and stand upon short foot-stalks.

The fourth sort grows naturally in *India*; this has trailing stalks, which spread on the ground; they extend two feet or more in length, and put out roots from their joints, sending out many side branches. The leaves are long, broad, smooth, and entire. The flowers are very small and white; these fit close to the stalks at the base of the leaves.

The fifth sort grows naturally in the *West-Indies*; this has a purplish, hairy, branching stalk, which rises a foot and a half high. The leaves are long and broad, ending in acute points; they have a few sharp indentures on their edges, and stand opposite. The flowers are white, standing upon slender foot-stalks, which spring from the wings of the stalk, sometimes single, and at others two or three at the same joint.

The sixth sort grows naturally in both *Indies*; the stalks of this branch out their whole length, and decline downward. The leaves are smooth, heart shaped, and have three veins, indented on their edges, and stand opposite. The flowers stand upon long naked foot-stalks, which spring from the wings of the branches; they are of a yellow colour, and have oblong prominent disks, with a few very small rays.

These plants are propagated by seeds, which should be sown upon a moderate hot-bed in the spring; and when the plants are fit to remove, they should be transplanted on a fresh hot-bed to bring them forward, and must be afterward treated in the same way as other tender annual plants, being careful not to draw them up too weak. In *June* they

may be taken up with balls of earth, and planted in a warm border, where they must be shaded and watered till they have taken new root; after which they will require but little care, and will produce good seeds in autumn.

VERONICA. Tourn. Inst. R. H. 143. tab. 60. Male Speedwell, or Fluellin.

The Characters are,

The flower has a permanent empalement, cut into five acute segments; it has one tubulous petal the length of the empalement; the brim is cut into four oval plain segments, which spread open, and two stamina, which are terminated by oblong summits, with a compressed germen, supporting a slender declining style, crowned by a single stigma. The germen afterward becomes a compressed heart-shaped capsule with two cells, filled with roundish seeds.

The Species are,

1. *VERONICA spicis lateralibus pedunculatis, foliis oppositis, caule procumbente.* Lin. Mat. Med. 11. Speedwell with spikes of flowers growing upon foot-stalks, springing from the sides of the stalks, leaves placed opposite, and a trailing stalk; or common Male Speedwell, or Fluellin.

2. *VERONICA spicis terminalibus, foliis oppositis lineari lanceolatis subserratis.* Speedwell with spikes of flowers terminating the stalks, and narrow, spear-shaped, sawed leaves, placed opposite; or narrow-leaved spiked Speedwell.

3. *VERONICA spicis terminalibus, foliis oppositis lanceolatis serratis acuminatis.* Hort. Upsal. 7. Speedwell with spikes of flowers terminating the stalks, and acute-pointed sawed leaves, which are lance-shaped, placed opposite; or greater broad-leaved upright Speedwell.

4. *VERONICA spicâ terminali, foliis oppositis crenatis obtusis, caule ascendente simplicissimo.* Lin. Sp. Plant. 10. Speedwell with a spike of flowers terminating the stalk, obtuse crenated leaves placed opposite, and a single ascending stalk; or smaller spiked Speedwell.

5. *VERONICA spicis lateralibus paniculatis, foliis ovatis inæqualiter crenatis sessilibus.* Speedwell with spikes of flowers in panicles from the wings of the stalk, and oval leaves, which are unequally notched, and fit close; or *Hungarian* Speedwell.

6. *VERONICA spicis terminalibus, foliis oppositis obtusè serratis scabris, caule erecto.* Lin. Sp. Plant. 11. Speedwell with spikes of flowers terminating the stalk, rough, obtuse, sawed leaves, which are placed opposite, and an erect stalk; or *Welsh* spiked Speedwell.

7. *VERONICA spicis terminalibus, foliis quaternis quinifve.* Lin. Sp. Plant. 9. Speedwell with spikes of flowers terminating the stalks, and four or five leaves at each joint; or tall *Virginian* Speedwell with many spikes of white flowers.

8. *VERONICA spicis terminalibus, foliis ternis æqualiter serratis.* Hort. Upsal. 7. Speedwell with spikes of flowers terminating the stalks, and leaves growing by threes, which are equally sawed; or long-leaved spiked Speedwell.

9. *VERONICA spicis terminalibus, foliis ternis inæqualiter serratis.* Lin. Sp. Plant. 10. Speedwell with spikes of flowers terminating the stalks, and leaves growing by threes, which are unequally sawed.

10. *VERONICA spicis terminalibus, foliis oppositis crenatis, caule erecto.* Speedwell with spikes of flowers terminating the stalks, crenated leaves growing opposite, and an erect stalk.

11. *VERONICA spicis lateralibus pedunculatis laxis, foliis oppositis linearibus argutè dentatis.* Speedwell with loose spikes of flowers growing upon foot-stalks, springing from the wings of the stalk, and very narrow sharply-sawed leaves placed opposite; or *Austrian* Speedwell.

12. *VERONICA spicis terminalibus, foliis pinnato-incisis acuminatis.* Speedwell with spikes of flowers terminating the stalks, and acute-pointed leaves cut in the form of wings; or eastern Speedwell.

13. *VERONICA racemis lateralibus, foliis cordatis rugosis dentatis, caule striato. Lin. Sp. Plant. 13.* Speedwell with spikes of flowers proceeding from the wings of the stalk, rough, heart-shaped, indented leaves, and a strait stalk; or greatest Speedwell.

14. *VERONICA spicis terminalibus, foliis oppositis crenatis obtusis, caule erecto tomentoso. Hort. Upsal. 7.* Speedwell with spikes of flowers terminating the stalks, crenated obtuse leaves placed opposite, and an erect woolly stalk; or hoary, woolly, spiked Speedwell.

15. *VERONICA spicis longissimis lateralibus pedunculatis, foliis oppositis inaequaliter serratis.* Speedwell with the longest spikes of flowers springing from the wings of the stalk upon foot-stalks, and leaves placed opposite, which are unequally sawed.

16. *VERONICA racemis lateralibus, foliis ovatis planis, caule repente. Flor. Succ. 11.* Speedwell with lateral spikes of flowers, oval plain leaves, and a creeping stalk; or greater Water Speedwell, commonly called Brooklime.

There are several other species of this genus, some of which grow naturally in *England*; but, as they are rarely admitted into gardens, it is beside the intention of this work to mention them.

The first sort grows wild in woods, and other shady places, in divers parts of *England*, and is a plant of little beauty; but, as it is the sort which is used in medicine, under the title of *Paul's-Betony*, I thought it necessary to insert it here. This is a low plant, whose stalks trail upon the ground, and put out roots from their joints, whereby it spreads and propagates. The leaves are oval, about an inch long, sawed on their edges, and placed opposite. The flowers are disposed in spikes, which arise from the wings of the stalk; they are small, of a pale blue colour, and have one petal, which is cut at the brim into four segments; when they decay, the germen turns to a capsule, not unlike that of *Shepherd's Pouch* in shape, filled with small seeds.

This is generally brought to market by such persons as make it their business to gather herbs in the fields, so that it is not often cultivated in gardens; but those who have a mind to propagate it, may do it with much ease, for as the branches trail upon the ground, they push out roots from their joints, which branches being cut off and planted, will take root, and grow in almost any soil or situation. The whole herb is used in medicine, and is one of the *Wound-herbs* which are brought from *Switzerland*. A tea of this herb is much recommended for the gout and rheumatism.

The second sort grows naturally in *Italy* and *Spain*; this has a perennial root, which sends out many offsets, by which it is easily propagated. The lower leaves are long and hairy; the stalks rise a foot high, and are garnished with very narrow spear-shaped leaves, placed opposite, which have a few slight serratures on their edges. The stalks are terminated by long spikes of blue flowers, which are succeeded by seeds in capsules like the former. It has been doubted if this was specifically different from the common upright Speedwell; but I have many times propagated this by seeds, and have always found the plants so raised, maintain their difference. There is a variety of this with a flesh-coloured flower.

The third sort grows naturally in *Austria* and *Hungary*. The lower leaves of this are long, broad in the middle, drawing to a point at each end; they are sawed on their edges, and are of a lucid green colour. The stalks rise a foot and a half high, and are garnished with leaves of the same shape with the lower, but smaller, placed opposite; they are terminated by long spikes of blue flowers, which appear in *June*, and are succeeded by flat seed-vessels, filled with compressed seeds, which ripen in autumn.

The fourth sort grows naturally in the northern parts of *Europe*, and also in several closes near *Newmarket-Heath*. The lower leaves of this are about an inch and a half long, and three quarters of an inch broad, of a pale green colour, and notched on their edges. The stalks rise a foot and a half high; they do not branch; the leaves on the lower part stand opposite, but on the upper they are alternate; the stalks are terminated by short spikes of blue flowers, which appear about the same time as the former.

The fifth sort grows naturally in *Hungary*. The lower leaves of this are unequally notched; the stalks rise a foot high, garnished with leaves, placed opposite, of a lucid green, which sit close to the stalks. The flowers are disposed in panicked spikes, which stand upon long naked foot-stalks that spring from the upper wings of the stalk; they are larger than those of the other species, and are of a beautiful blue colour, so make a fine appearance, but are of short duration.

The sixth sort grows naturally on the *Alps* and *Pyrenean* mountains, and also upon the mountains in *Wales*. The lower leaves of this are rough and hairy, blunt-pointed, and obtusely sawed on their edges, standing upon pretty long foot-stalks; the stalks grow erect about six or eight inches high, garnished with oval notched leaves, placed opposite. From the side of the stalk spring out two or three branches, which toward the bottom are garnished with small leaves, placed opposite, but terminate in long spikes of pale blue flowers. The spikes on the side branches are four or five inches long, but those of the principal stalk are eight or nine.

The seventh sort grows naturally in *Virginia*. The stalks of this are erect, and rise four or five feet high, garnished at each joint by four or five spear-shaped sawed leaves, which stand round the stalk in whorls, ending in acute points. The stalks are terminated by long slender spikes of white flowers, which appear late in *July*; these are succeeded by compressed capsules, filled with seeds, which ripen in autumn.

The eighth sort grows naturally in *Italy* and the south of *France*. The stalks of this rise three feet high, garnished with leaves, placed by fours toward the bottom, but at the top by threes at each joint; they are deeply sawed on their edges, ending in acute points, of a bright green colour; the stalks are terminated by spikes of blue flowers.

The ninth sort grows near the sea in several parts of *Europe*. The stalks of this do not rise so high as those of the former; the leaves are placed by fours and threes round the stalk, and have longer foot-stalks; they are broader at the base, and run out into long acute points; they are unequally sawed on their edges, and are of a bright green colour. The flowers are disposed in spikes, which terminate the stalks, of a bright blue colour.

The tenth sort grows naturally in many parts of *France* and *Germany*. The stalks of this are single, and do not branch; they are round, hairy, and rise a foot and a half high, garnished with spear-shaped hairy leaves. The stalk is terminated by a long spike of blue flowers.

The eleventh sort grows naturally in *Austria*. The lower leaves of this are narrow, and cut into fine segments; the stalks are slender, and incline downward, garnished with linear leaves, which are acutely notched on their edges; the flowers are disposed in long loose spikes, which spring from the wings of the stalk, of a bright blue colour, and stand upon foot-stalks.

The twelfth sort grows naturally in the *Levant*; this has slender branching stalks which decline, and are garnished with narrow leaves, which are acutely cut on their edges, of a pale green colour, and smooth. The flowers are disposed in loose spikes on the top and from the side of the stalks, of a pale blue colour.

The thirteenth sort grows naturally upon *Mount Baldus* in *Italy*. The stalks of this are slender, stiff, and upright, garnished by rough heart-shaped leaves, which are indented, and placed opposite; those on the lower part of the stalk are small; in the middle they are much larger, and diminish again in their size toward the top. The flowers come out in spikes from the wings of the stalk toward the top, of a bright blue colour.

The fourteenth sort grows naturally in the *Ukrain Tartary*. The stalks of this are very white and woolly; they rise about a foot and a half high, garnished with oblong hoary leaves, placed opposite, notched on their edges, and sit close to the stalks, which are terminated by spikes of deep blue flowers, which stand erect.

The fifteenth sort grows naturally in *Austria* and *Bohemia*. The stalks are slender, about a foot and a half long, inclining downward; the leaves are nearly oval, but are acute-pointed, unequally sawed, and sit close to the stalks. The flowers are disposed in long loose spikes upon foot-stalks, arising from the wings of the stalk; those on the lower part of the stalk are eight or nine inches long. The flowers are of a bright blue colour: the leaves of this sort are frequently variegated with yellow.

The sixteenth sort is the common Brooklime, which grows naturally in brooks and streams of water in most parts of *England*, so is not cultivated in gardens, but as it is much used in medicine, I have given it a place here. The stalks of this are thick, succulent, and smooth, emitting roots from their joints, whereby they spread and propagate. The leaves are oval, flat, succulent, and smooth; they stand opposite; the flowers come out in long bunches from the wings of the stalk; they are of a fine blue colour, and stand upon short foot-stalks; these appear great part of summer, and are succeeded by heart-shaped seed-vessels, filled with roundish seeds. The whole herb is used, and is esteemed an excellent antiscorbutick.

These plants may all be propagated by parting their roots, which may be done every other year, for if they are not often parted or divided, they will many of them grow too large for the borders of small gardens; but yet they should not be parted into very small heads, because when they have not a number of stems, so as to form a good bunch, they are soon past their beauty, and have but a mean appearance. The best time to part these roots is at *Michaelmas*, that they may be well rooted again before winter; for when they are removed in the spring, they seldom flower strong the same year, especially if the season should prove dry. Those sorts which grow pretty tall, are very proper to plant on the sides of open wilderness quarters, but those with trailing branches are fit for the sides of banks or irregular shady slopes, where they will make an agreeable variety; they are all of them very hardy, so are in no danger of suffering by cold, and require no other care but to keep them clean from weeds, and to be transplanted every second or third year.

They may also be propagated by seeds, which should be sown in autumn, for when they are sown in the spring, the plants rarely come up the same year; but, as most of the sorts propagate very fast by their offsets, their seeds are seldom sown.

If these plants are placed in a shady border, they will thrive much better than when they are more exposed to the sun, and their flowers will continue much longer in beauty.

VIBURNUM. *Lin. Gen. Plant.* 332. The Wayfaring, or pliant Meally-tree.

The Characters are,

The flower has a small permanent empalement, which is cut into seven parts; it has one bell-shaped petal, cut at the brim into five obtuse segments, which are reflexed; it has five awl-shaped sta-

mina the length of the petal, terminated by roundish summits, and a roundish germen, situated under the flower, having no style, but the place is occupied by a roundish gland, and crowned by three obtuse stigmas. The germen afterward turns to a compressed fruit with one cell, inclosing one hard seed.

The Species are,

1. VIBURNUM foliis cordatis serratis venosis subtus tomentosis. *Vir. Cliff.* 25. Wayfaring-tree with heart-shaped, sawed, veined leaves, which are woolly on their under side.

2. VIBURNUM foliis subrotundis crenato-serratis glabris. *Flor. Virg.* 33. Wayfaring-tree with roundish, crenated, sawed leaves, which are smooth; commonly called Black Haw.

3. VIBURNUM foliis ovato-orbiculatis profundè serratis venosis. Way-faring-tree with oval round leaves, which are deeply sawed and veined.

4. VIBURNUM foliis ovatis integerrimis, ramificationibus subtus villoso-glandulosis. *Lin. Sp. Plant.* 267. Wayfaring-tree with oval entire leaves, whose branches are hairy, and glandulous on the under side; or hairy-leaved Laurustinus.

5. VIBURNUM foliis ovato-lanceolatis integerrimis, utrinque virentibus lucidis. The shining-leaved Laurustinus.

6. VIBURNUM foliis ovato-lanceolatis integerrimis, subtus venosis. *American* Tinus with oval leaves, which are entire.

7. VIBURNUM foliis lobatis petiolis glandulosis. *Lin. Sp. Plant.* 261. Common Guelder Rose.

8. VIBURNUM foliis cordato-ovatis acuminatis serratis, petiolis longissimis lævibus. *American* Guelder Rose with acute-pointed sawed leaves, and white flowers.

The first sort grows naturally in many parts of *Europe*, and is the common Viburnum or Lantana of the old botanists. The leaves are heart-shaped, much veined, irregularly sawed on their edges, and are very woolly on their under side. The stalks are woody, and rise twelve or fourteen feet high, sending out strong ligneous branches, which are covered with a light coloured bark; these are terminated by umbels of white flowers, whose summits are red, and are succeeded by roundish compressed berries, which turn first to a bright red colour, and are black when ripe, inclosing one seed of the same shape.

There is a variety of this with variegated leaves, which is preserved in some of the gardens near *London*; but when the plants are removed into good ground, and are vigorous, their leaves become plain.

The second sort grows naturally in most parts of *North America*, where it is commonly called Black Haw. This rises with a woody stalk ten or twelve feet high, covered with a brown bark, and sends out branches from the side; these, when young, are covered with a purple smooth bark, and are garnished with oval smooth leaves, which are slightly sawed on their edges, and stand upon short slender foot-stalks, sometimes opposite, and at others without order. The flowers are disposed in small umbels, which come out from the side and at the end of the branches; they are white, and smaller than those of the common Viburnum; these are succeeded by berries, which ripen in autumn.

The third sort grows naturally in *North America*. The stalks of this are soft and pithy, and branch out greatly from the bottom upward. The bark is of a gray colour; the leaves are roundish, oval, strongly veined, and sawed on their edges, of a light green colour, and placed opposite upon pretty long foot-stalks. The flowers are disposed in a corymbus at the end of the branches, which are white, and almost as large as those of the common sort; these appear the latter end of *June*, but are seldom succeeded by seeds in *England*.

The fourth sort is the Laurustinus with small leaves, which are hairy on their under side; this plant is so well known as to need no description, but as it is frequently confounded with

with the next, it may be necessary to point out its difference. The leaves of this are seldom more than two inches and a half long, and one and a quarter broad; they are rounded at their base, but end in acute points; they are veined and hairy on their under side, and are not of so lucid a green colour on their upper side. The umbels of flowers are smaller, and appear in autumn, continuing all the winter, and the plants are much hardier.

The fifth sort is commonly known in the nursery-gardens by the title of shining leaved Laurustinus. The stalks of this rise higher, the branches are much stronger than those of the former sort. The bark is smoother, and turns of a purplish colour; the leaves are larger, of a thicker consistence, and of a lucid green colour; the umbels are much larger, and so are the flowers; these seldom appear till the spring, and when the winters are sharp, the flowers are killed, so never open unless they are sheltered. The plants of this sort were formerly kept in tubs, and housed in winter, and, when they were so treated, made a fine appearance early in the spring, and in very mild seasons the plants in the open air do the same.

There is a variety of this with variegated leaves, which makes as good a figure as any of the striped plants which are preserved in gardens.

The sixth sort is a native of *North America*, where it rises to the height of ten or twelve feet, sending out branches on every side their whole length; these have a smooth purplish bark, garnished with oval entire leaves, of a thick consistence, and of a lucid green; they stand opposite. The flowers are produced in umbels at the end of the branches; they are white, and not unlike the flowers of Laurustinus; these appear in *July*, and are succeeded by berries, which seldom ripen in *England*.

There seems to be two sorts of this in the gardens, one of which comes from the more northern parts of *America*, and sheds its leaves in winter; the other, which grows in *Carolina* and *Virginia*, is an ever-green, but both are so much alike in summer, as scarce to be distinguished.

The seventh sort is the common Marsh Elder, which grows naturally in marshy grounds, and on the sides of rivers in many parts of *England*, so is not often kept in gardens; it is called by some of the nursery-gardeners Guelder Rose with flat flowers, to distinguish it from the other, whose flowers are globular. The Marsh Elder is the original species, and the Guelder Rose is a variety which accidentally arose from it. The former has a border of male flowers, which are large, and the middle of the umbel is composed of hermaphrodite flowers, which are succeeded by oval red berries; the latter has all male flowers, of the same size and shape with those of the border of the first, so that they swell out into a round figure, which has occasioned some country people giving it the title of Snowball-tree. This sort is cultivated in gardens for the beauty of its flowers, which make a fine appearance during their continuance.

It will rise to the height of eighteen or twenty feet, if it is permitted to stand. The stem becomes large, woody, and hard; the branches come out opposite, and are apt to grow irregular; they have a gray bark. The leaves are placed opposite; they are divided into three or four lobes, somewhat like those of the Maple, jagged on their edges, and of a light green colour. The flowers come out at the end of the branches; those of the first in large umbels, and those of the second in a corymbus; they are very white, and appear the beginning of *June*; those of the first have oval berries succeeding the hermaphrodite flowers, which turn of a scarlet colour when ripe, but the other, having only male flowers, are barren.

The eighth sort grows naturally in *Carolina* and some other parts of *North America*; this rises with a shrubby stalk eight

or ten feet high, sending out many branches, which are covered with a smooth purple bark, garnished with heart-shaped oval leaves, ending in acute points; they are deeply sawed on their edges, have many strong veins, and stand upon very long slender foot-stalks opposite. The flowers are collected into large umbels at the end of the branches; those ranged on the border are male and barren, but the middle is composed of hermaphrodite flowers, which are succeeded by oval berries. The flowers are white, and the berries are red when ripe.

The first sort may be propagated either from seeds, or by laying down the tender branches; but the former method being tedious, is seldom practised, because the seeds seldom grow the first year, unless they are sown in autumn, and as the branches easily put out roots, that is the more expeditious method.

The best time for laying these branches is in autumn, just as the leaves begin to fall (the manner of laying them being the same as for other hardy trees, need not be here repeated). By the succeeding autumn the layers will be rooted, when you may take them off from the old plants, and transplant them into a nursery for two or three years, in which they may be trained up to regular stems and heads, and may afterward be planted where they are to remain.

The second sort is generally propagated by layers here, because the seeds do not often ripen in *England*. The young shoots of this take root very freely; the cuttings will also take root, if they are planted in autumn; the seeds, when they are brought to *England*, always remain in the ground a year like those of the other sorts, so that the propagating the plants by seeds is a tedious method.

The Laurustinuses are propagated by laying down their young branches, which put out roots very freely; so that when they are layed in autumn, they will be well rooted by that time twelve months, when they should be taken off from the old plants, and may either be planted where they are to remain, or into a nursery to grow two years to get strength. The best season to transplant these is at *Michaelmas*, that they may get new root before winter; for as these plants begin to flower early in winter, it is a plain indication of their growing at that season, so they will more surely succeed than at any other time of the year, though they may be removed in the spring with balls of earth to their roots, provided it is done before they begin to shoot; they may also be removed the latter end of *July* or the beginning of *August*, if rain happens at that time, for after they have done shooting, which is soon after *Midsummer*, they will be in no danger, provided they are not kept out of the ground any time.

These plants may also be propagated by seeds, which should be mixed with earth in autumn, soon after they are ripe; these should be exposed to the open air, and receive the rain in winter, and in the spring they may be sown upon a gentle hot-bed, which will bring up the plants; these should remain in the bed till autumn, and then may be transplanted and treated in the same way as the layers. I have raised many of these plants from seeds, which I find hardier than those raised by layers.

Some people train up the Laurustinus with naked stems to have round heads, but if these are planted in the open air, they will be in more danger of suffering by severe frost, than those whose branches grow rude from the bottom; for if the frost kills the outer part of the shoots, the stems will be protected, so will soon put out new branches; but where the stems are naked, the frost frequently kills them to the root.

The sixth sort may be propagated in the same way as the Laurustinus, and requires the same treatment; it loves a soft loamy soil, and should have a sheltered situation.

The seventh and eighth sorts are easily propagated by layers or cuttings. The common Guelder Rose sends out plenty of suckers from the roots, by which it is frequently propagated; but as the plants so raised are very subject to put out suckers, they are not so good as those which come from layers or cuttings. Both these sorts love a moist soil, in which they will make much greater progress, and produce their flowers in greater plenty than on a dry soil.

They are both very hardy, so will thrive in the coldest situations, but not within the spray of the sea. The common Guelder Rose is seldom suffered to stand very long in gardens, but I have seen one in an old garden, whose stem was more than two feet and a half round.

VICIA. *Tourn. Inst. R. H.* 396. *tab.* 221. Vetch, or Tare.

The Characters are,

The flower is of the butterfly kind; the standard is oval, broad at the tail, indented at the point, and the borders are reflexed; the two wings are shorter than the standard; the keel is shorter than the wings; the tail is oblong. It has ten stamina, nine joined and one separated, terminated by erect summits, and a linear compressed germen, supporting a slender style, crowned by an obtuse stigma, which is bearded on the under side. The germen afterward turns to a long pod with one cell opening with two valves, ending with an acute point, containing several roundish seeds.

The Species are,

1. VICIA *pedunculis multifloris, floribus imbricatis, foliolis lanceolatis pubescentibus, stipulis integris.* *Lin. Sp. Plant.* 735. Vetch with many imbricated flowers on a foot-stalk, spear-shaped hairy lobes to the leaves, and entire stipula; or many-flowered Vetch.

2. VICIA *pedunculis multifloris, foliolis ovalibus, stipulis denticulatis.* *Lin. Sp. Plant.* 734. Vetch with foot-stalks supporting many flowers, oval lobes to the leaves, and indented stipula; or the largest many-flowered Wood Vetch.

3. VICIA *pedunculis subsexfloris, foliolis denis ovatis acutis, stipulis integris.* *Lin. Sp. Plant.* 735. Vetch with foot-stalks, having about six flowers, leaves with ten oval acute lobes, and entire stipula.

4. VICIA *pedunculis multifloris, petiolis sulcatis, subdodecaphyllis, foliolis lanceolatis glabris.* *Lin. Sp. Plant.* 736. Many-flowered Vetch with furrowed foot-stalks, and for the most part twelve spear-shaped smooth lobes to each leaf.

5. VICIA *leguminibus sessilibus subbinatis erectis, foliis retusis, stipulis notatis.* *Lin. Sp. Plant.* 736. Vetch with erect pods growing by pairs, and sitting close to the stalks, blunt lobes to the leaves, and spotted stipula; or common cultivated Vetch, with a black seed, frequently called Tares.

There are many more species of this genus, some of which grow naturally in England; but as they are rarely cultivated, except in botanick gardens for the sake of variety, they are omitted, as they are plants of little use or beauty.

The first sort here mentioned grows naturally among bushes, and by the sides of woods in most parts of England. The root is perennial, but the stalks are annual; these are weak, requiring support; they rise five or six feet high, fastening their tendrils, which grow at the end of their leaves, to the bushes or hedges, whereby they climb; they are hairy, as are also the leaves, which are composed of about ten pair of spear-shaped lobes, terminated by a tendril. The flowers stand upon long foot-stalks, which spring from the wings of the stalk; the spikes are long; the flowers lie one over the other; they are of a fine blue colour, so make a pretty appearance, when they come out from between the bushes or shrubs which support them; they appear in July, and are succeeded by compressed pods, filled with round seeds, which ripen in autumn.

The second sort grows naturally in the woods near Bath and Bristol; this has a perennial root. The stalks are weak,

and climb by the help of their tendrils over the neighbouring bushes and hedges, rising to the height of seven or eight feet. The leaves are composed of seven or eight pair of oval smooth lobes, terminated by tendrils. The flowers are produced in long spikes from the wings of the stalks; they are of a pale blue colour, and are larger than those of the former sort; they appear in July, and are succeeded by short smooth pods, filled with round seeds, which ripen in autumn.

The third sort grows naturally in *Cassubia*; this has a ligneous creeping root; the stalks trail upon the ground; they grow three feet long, and their lower part become ligneous toward autumn, but they die to the root in winter. The leaves are composed of ten pair of oval acute-pointed lobes. The flowers come out from the wings of the stalk; they are disposed in short spikes, each containing, for the most part, six pale blue flowers, which appear in July, and are succeeded by short smooth pods like those of Lentils, including three or four round seeds, which ripen in autumn.

These sorts have been recommended to be sown in the fields for fodder for cattle; but as their stalks are slender and less succulent than those of the common Vetch, so it is doubtful, if these will answer the purpose of farmers to cultivate them; for as their stalks trail to a great length, so if they have not support, they will be subject to rot by lying upon the ground; and although their roots are perennial, yet as it is late in the spring before they shoot to a height sufficient to cut for use, so there is little want of green feed for cattle at that time.

However, a few of these plants may be allowed a place in large gardens for the sake of variety, where, if they are properly placed, they may be ornamental, particularly on the borders of wood-walks, or in thickets of shrubs. If some of the first sort are allowed to climb up upon their branches, they will have a good effect during their continuance in flower.

These sorts are propagated by seeds, which should be sown in autumn soon after they are ripe, for if they are kept out of the ground till spring, the seeds often fail, or at least remain in the ground a year before they vegetate; they should be sown in the places where the plants are designed to remain, for they do not bear transplanting well. These plants grow naturally in woods and thickets of bushes, where their roots are screened from the sun, and their stalks furnished with supports by the bushes, point out the places where the seeds should be sown, which should be where they are sheltered by shrubs. If three or four seeds are sown in each patch, it will be sufficient, for if one or two plants come up in each place, it will be enough. When the plants come up, they will require no other culture but to keep them clean from weeds, and their stalks must be permitted to climb upon the neighbouring shrubs; for if they trail upon the ground, they will produce few flowers, and in wet seasons the stalks will rot, so the plants will be rather unsightly.

The fourth sort grows naturally in *Siberia*; this is a biennial plant, which promises fairly to become a useful one for fodder; for the stalks of this grow to a great length, and are well furnished with leaves: these do not decay in autumn, but continue green through the winter in defiance of the most severe frost; so that in *February* and *March*, when there is often a scarcity of green feed for ewes and lambs, this may be of great service.

The stalks of this rise five or six feet high. The leaves are composed of five or six pair of smooth spear-shaped lobes, terminated by tendrils. The foot-stalks are deeply furrowed. The flowers are produced in spikes upon long foot-stalks, which spring from the wings of the stalks; they are of a light blue colour, and appear in July; these are succeeded

by short compressed pods, containing three or four round seeds, which ripen in autumn.

This sort is propagated by seeds, which may be sown in the spring or autumn; and when the plants come up, they will require no other culture but to keep them clean from weeds; and if they are supported from trailing upon the ground, they will continue in verdure all the winter, and the following summer they will flower and produce ripe seeds.

If this plant is designed for feed, the seeds should be sown in rows at four feet distance, and should be dropped thin in the rows, for as the stalks send out many branches, and extend to a great length, so when the plants are too close, the branches will intermix, and mat so closely together, as to rot each other by excluding the air. When the plants come up, they must be kept clean from weeds, which, while they are young, should be performed with *Dutch hoes*, but afterward it may be done by the hoeing-plough, which will save expence; and with this instrument the plants may be earthed up in the same manner as Peas and Beans, which will greatly strengthen their stalks, and make them and the leaves larger and more succulent, so increase the quantity of feed. If this is practised as often as may be found necessary to destroy the weeds in summer, it will prepare the ground for any crop which may afterward be put upon the land; and as this will be in no danger of suffering from frost, so it should be preserved till the spring, when there is a want of green feed for ewes; at which time it may be cut as it is wanted, but a part of the plants should be permitted to stand for seeds, for those which are cut, if they do shoot again, will flower so late in summer, that unless the autumn proves very warm, the seeds will not ripen; therefore it will be a better way to sow a sufficient quantity of seeds for this purpose, in a separate spot of ground, because, when the other is cut, the ground may be ploughed for other crops; and if in mild seasons there may be so great plenty of other green feed as not to want this, if the plants are ploughed into the ground, it will be a good dressing for other crops.

This is what I am now beginning to try in the field, where I have not as yet had experience of its culture; but what I have here advised, is founded upon experiments which I have for several years made, on small patches sown in gardens in different situations. In all these patches I have found the plants continue in great verdure, when most of the perennial plants in the same situation have suffered greatly by the frost; and from eight of these plants I could have cut as much seed as would have been equivalent to half a truss of green Clover.

The fifth sort is the common Vetch or Tare, which is much cultivated in the fields for fodder; of this there are two varieties, if not distinct species. The first, which is the most common, has a black seed; the other has seeds as white, if not whiter than the whitest Peas; and this difference is permanent, for I have sown both sorts many years, and have never found either of them vary. These plants are annual, and perish soon after they have perfected their seeds. The stalks are angular, streaked, and hairy; they are weak and want support, so generally decline where they have nothing near to fasten themselves to. The leaves are composed of several pair of blunt lobes, and are terminated by tendrils. The flowers come out from the wings of the stalk, sitting very close to the base of the foot-stalks of the leaves; two of these generally spring from the same joint; they are pretty large, and of the butterfly shape; they are purple, and appear in *June* and *July*, which are succeeded by erect pods, containing three or four round seeds in each.

There is another kind of Vetch which is cultivated in the fields, with a smaller black seed; this is called in some

counties Rath ripe Vetch, and in others Pebble, or Summer Vetch; but this being much tenderer than the common Vetch, is not much cultivated, as it must always be sown in the spring, and will ripen its seeds the same summer; but it will not afford near so much fodder as the other.

Vetches are generally sown at two seasons, one is in autumn, and the other early in the spring; but the best time is in *August*, for the seeds which are sown then will come up soon, and the plants will have time to get strength before winter, so will be in less danger of suffering by frost than those which are sown later, and will be fit to cut for feed much earlier in the spring, for that is the time when green feed is most wanted; and if they are designed for seed, and not to be cut for fodder, those early-sown Vetches will come soon into flower, and the seeds will be ripe early, so they may be cut and stacked in good weather, which is a great advantage, for those which ripen late are often stacked or housed wet, and then the seeds frequently sprout in the mow and are spoiled.

The usual method of sowing Vetches is in broad-cast, ploughing them lightly in; in this way the common allowance of seeds for one acre of land, is two bushels; but there are some who sow two bushels and a half; this practice may do well enough for those Vetches which are designed to be cut for fodder in the spring, but those which are sown with an intent to stand for seeds, will do much better if they are sown in drills, in the same way as is practised for Peas, and then less than half the quantity of seeds will be sufficient, for the drills should not be nearer to each other than three feet, that the hoe-plough may have room to go between them, to destroy the weeds, and earth up the plants, for by this management they will produce a much greater crop, and ripen earlier in the season. These drills should be about the same depth as those usually made for Peas, and the seeds should be scattered about the same distance in the drills. These seeds should be carefully covered as soon as they are sown; for if they are left open, the rooks will discover them, and when they once find the rows, if they are not carefully watched, they will entirely devour them. Indeed these being sown early in autumn, will be in less danger than those which are sown late, or in the spring, because there is more food for rooks and pigeons in the open fields at this season, and the plants will appear much sooner above ground. The best time to sow them is about the beginning of *August*, for the rains which usually fall about that season, will bring them up in a short time. Toward the latter end of *October* the plants will have obtained considerable strength, therefore they should be earthed up with the hoeing-plough. This work should be performed in dry weather, and in doing it care must be had to lay the earth up as high to the stems of the plants as possible, so as not to cover their stalks, because this will secure them against frost. The whole space of ground between the rows should also be stirred, in order to destroy the weeds, which, if carefully performed in dry weather, will lay the land clean till *March*; at which time the crop should be earthed a second time, and the ground cleaned again between the rows, which will cause the plants to grow vigorous, and in a little time they will spread so as to meet, and cover the spaces; whereas those sown in the spring, will not grow to half this size, and will be much later in flowering.

Some people sow these Vetches, and when they are fully grown, plough them into the ground to manure it. Where this is designed, there will be no occasion to sow them in drills at this distance, nor to husband them in the manner before directed; but in this case it will be the best method to sow them in autumn, because they will be fit to plough in much sooner the following year, so that the land may be better prepared to receive the crops for which it is intended.

tended. In some parts of *France*, and in *Italy*, these Vetches are sown for feeding of cattle while green, and are accounted very profitable, and in many parts of *England* they are cultivated to feed cart-horses, &c. though upon such land where Lucern will thrive, it will be much better husbandry to cultivate that for this purpose.

Where these plants are cultivated for their seeds, they should be cut soon after the pods change brown; and when they are dry, they must be immediately stacked, for if they are suffered to lie out in the field to receive wet, and there come one hot day after it, the pods will most of them burst, and cast out the seeds. When the seeds are threshed out, the haulm is esteemed very good for cattle; and some have recommended the seeds for horses, and affirm they are as proper for those animals as Beans, which, if true, will render them more valuable, because these will grow on the lightest sandy land, where Beans will not thrive, so may be a good improvement to some counties in *England*, where they do not attempt to cultivate Beans.

VINCA. *Lin. Gen. Plant.* 261. Periwinkle.

The Characters are,

The empalment of the flower is permanent. The flower has one salver-shaped petal, whose tube is longer than the empalment. The brim is broad, spreading open, and slightly cut into five obtuse segments; it has five very short inflexed stamina, terminated by erect obtuse summits, and two roundish germen, which have two roundish corpuscles on their side, supporting one common style the length of the stamina, crowned by two stigmas. The germen afterward turns to a fruit, composed of two taper acute-pointed husks, opening lengthways with one valve, and filled with oblong cylindrical seeds.

The Species are,

1. VINCA *caulibus procumbentibus, foliis lanceolato-ovatis.* *Lin. Sp. Plant.* 209. Periwinkle with trailing stalks, and oval spear-shaped leaves; or common narrow-leaved Periwinkle.

2. VINCA *caulibus erectis, foliis ovatis.* *Lin. Sp. Plant.* 209. Periwinkle with erect stalks, and oval leaves; or broad-leaved Periwinkle.

3. VINCA *foliis oblongo ovatis integerrimis, tubo floris longissimo, caule ramofo fruticoso.* *Tab.* 86. Periwinkle with oblong, oval, entire leaves, a very long tube to the flower, and a shrubby branching stalk.

The first sort grows naturally under hedges and bushes in many parts of *England*. The stalks are slender, and trail upon the ground, emitting fibres from their joints, which take root, whereby the plant multiplies and spreads greatly. The leaves are placed opposite on their stalks; they are oval, spear-shaped, of a thick consistence, very smooth, and entire; their upper side is of a lucid green, and their under of a paler colour. The flowers stand singly upon foot-stalks, which spring from the wings of the stalks; they are nearly of a funnel-shape, but spread more at their brim, which is almost flat like a salver; their brim is divided into five broad obtuse segments. The most common colour of the flower is blue; but it is often found with a white flower, and sometimes the flowers are variegated with both colours. These flowers begin to appear in *April*, and there is often a succession of them continued great part of summer. The flowers are very rarely succeeded by seeds. *Tournefort* says, he was at a loss for the fruit of this plant, to engrave the figure of it in his *Elements of Botany*, which he obtained by planting some plants in small pots to confine their roots and prevent their stalks from trailing upon the ground. This experiment I tried several years without success; but I afterward planted three or four plants in the full ground, and constantly cut off their lateral shoots, leaving only the upper stalks; and these plants the second year produced plenty of the pods.

There are two varieties of this plant with variegated leaves; one has white, and the other yellow stripes; these are by some preserved in their gardens for the sake of variety. There is also one with double purple flowers, which I believe to be only an accidental variation, therefore have not enumerated it here.

The second sort is also found growing naturally in several parts of *England*. The stalks of this are larger than those of the former, and do not trail so close to the ground; they rise two feet high, but their tops decline again to the ground, and often put out roots when they are suffered to lie on the ground. The leaves of this sort are oval, heart-shaped, and stand opposite upon thick foot-stalks; their upper surface is of a lucid green, their under is of a lighter green colour; they are of a thick consistence, and entire. The flowers come out from the wings of the stalk in like manner as the former, and are of the same shape, but much larger. The usual colour is blue, but they are sometimes seen with white flowers. This sort flowers earlier in the spring than the former, and there is a succession of them great part of summer.

As these plants delight to grow under the cover of trees and bushes, so they may be made ornamental in large gardens, if they are planted on the verges of wildernesses, where they will spread and cover the ground; and as their leaves continue green all the year, they will have a good effect in winter, and their flowers appearing great part of summer, will add to the variety.

They are easily propagated by their trailing stalks, which put out roots very freely, especially those of the first sort; and if the stalks of the large sort are laid in the ground, they will root very soon, and may be cut off and transplanted where they are to remain; when they are once rooted, they will spread and multiply very fast without farther care. The first sort is used in medicine, and is esteemed a good vulnerary plant.

The third sort grows naturally in the island of *Madagascar*, from whence the seeds were brought to the Royal Garden at *Paris*, where the plants were first raised, and produced their flowers the following summer; from these plants good seeds were obtained, which were sent me by Mr. *Richard*, gardener to the king at *Versailles* and *Trianon*. It rises with an upright branching stalk to the height of three or four feet, which when young are succulent, jointed, and of a purple colour; but as the plants advance, their lower parts become ligneous. The branches which come out from the side, have their joints very close; they have a smooth purple bark, and are garnished with oblong, oval, entire leaves, which are smooth and succulent, sitting pretty close to the branches. The flowers come out from the wings of the branches singly, standing upon very short foot-stalks; their tube is long and slender; their brim spreads open flat, which is divided into five broad obtuse segments, which are reflexed at their points. The upper surface of the petal is of a bright crimson or Peach colour, and their under side is of a pale flesh colour. There is a succession of these flowers upon the same plant, from *February* to the end of *October*. Those flowers which appear early in the summer, are succeeded by taper seed-vessels, filled with roundish black seeds, which ripen in autumn.

This sort is propagated by seeds or cuttings; those plants which arise from seeds grow more upright, and do not branch so much as the plants which are propagated by cuttings. The seeds of this should be sown upon a moderate hot-bed in the spring; and when the plants come up, and are fit to remove, they should be transplanted on a fresh hot-bed at about four inches distance, shading them from the sun till they have taken new root; then they must be treated in the same way as other tender plants which are natives of warm countries;

countries; but there must be great care had to prevent their drawing up weak, nor should they have water in too great plenty. When the plants have obtained strength, they should be carefully taken up with balls of earth to their roots, and planted in pots filled with good earth, and plunged into a moderate hot-bed to facilitate their taking new root, observing to screen them from the sun; and when they are well rooted in the pots, they must be gradually hardened to bear the open air; but unless the summer proves warm, these plants should not be placed abroad, for they will not thrive if they are exposed to cold or wet; therefore during the summer they should be placed in an airy glass-case, and in winter they must be removed into the stove, where the air is kept to a temperate heat, without which they will not live through the winter in *England*.

If these plants are propagated by cuttings, they should be planted in pots during any of the summer months. The pots should be plunged into a moderate hot-bed, and if they are closely covered with bell or hand glasses, it will cause them to put out roots sooner than they otherwise would do; when these have put out roots, they must be gradually hardened, and afterward planted in pots, and treated in the same way as the seedling plants.

This plant deserves a place in the stove, as much as any of the exotic plants we have in *England*, because the flowers are very beautiful, and there is a constant succession of them all the summer.

VINCITOXICUM. See *Asclepias*.

VINE. See *Vitis*.

VIOLA. *Tourn. Inst. R. H. 419. tab. 236.* Violet.

The Characters are,

The flower has a short permanent empalement of five leaves, which are differently ranged in the different species. The flower is of the ringent kind, and is composed of five unequal petals; the upper is broad, obtuse, and indented at the point, having a horned nectarium at the base; two side petals are opposite; the two lower are larger, and reflexed; it has five small stamina, which are annexed as appendages to the entrance of the nectarium, terminated by obtuse summits, which are sometimes connected, and a roundish germen, supporting a slender style, which stands out beyond the summits, and is crowned by an oblique stigma. The germen afterward turns to an oval three-cornered capsule with one cell, opening with three valves, including many oval seeds.

The Species are,

1. *VIOLA acaulis, foliis cordatis, stolonibus reptantibus.* *Lin. Sp. Plant. 934.* Violet having stalks, heart-shaped leaves, and creeping shoots; or Purple March Violet.

2. *VIOLA acaulis, foliis cordatis piloso-hispidis.* *Flor. Succ. 718.* Violet without stalk, having heart-shaped leaves with stinging hairs; or hairy, scentless, March Violet.

3. *VIOLA acaulis, foliis reniformibus.* *Haller. Helvet. 501.* Violet without stalk, and kidney-shaped leaves; or Violet with round smooth leaves.

4. *VIOLA acaulis, foliis lanceolatis crenatis.* *Lin. Sp. Plant. 934.* Violet without stalks, and spear-shaped notched leaves; or *Acadian Violet*.

5. *VIOLA acaulis, foliis pedatis septempartitis.* *Lin. Sp. Plant. 933.* Violet without stalks, and leaves growing like feet, divided into seven parts; or three-coloured *Virginia Violet*.

6. *VIOLA acaulis, foliis palmatis quinque lobis dentatis indivisissimisque.* *Lin. Sp. Plant. 933.* Violet without stalks, and hand-shaped leaves, with five indented undivided lobes; or *Virginia Violet*, with leaves like those of the Plane-tree.

7. *VIOLA acaulis, foliis pinnatifidis.* *Lin. Sp. Plant. 734.* Violet without stalks, and leaves having many points; or *Alpine Violet*.

8. *VIOLA acaulis, grandiflora, foliis ovalibus uniformibus integerrimis.* *Allion.* Violet without a stalk, having a large flower, and oval entire leaves, which are uniform.

9. *VIOLA caulibus erectis, foliis cordatis oblongis.* *Lin. Sp. Plant. 935.* Violet with erect stalks, and oblong heart-shaped leaves; or tree-like purple Violet.

10. *VIOLA caule triquetro diffuso, foliis oblongis dentatis, stipulis multifidis.* Violet with a four-cornered diffused stalk, oblong indented leaves, and many-pointed stipulae; commonly called Hearts-ease or Pansies.

11. *VIOLA caule diffuso decumbente, foliis oblongis incisissimis, stolonibus reptatricibus.* Violet with a diffused trailing stalk, oblong cut leaves, and creeping shoots; or yellow Mountain Violet with a large flower.

The first sort, which is the common sweet Violet, grows naturally under hedges in the neighbourhood of *London*; but in several of the distant counties, the Violet without scent is the sort most frequent. Of the common Violet there are the following varieties. The single blue and white; the double blue and white; and the pale purple. These are all of them commonly preserved in gardens for the odour of their flowers, and are so well known as to need no description.

The second sort is found growing naturally in many parts of *England*. The leaves of this are larger, and are covered with rough stinging hairs. The flowers are larger, and have no scent, which are the only differences.

The third sort grows naturally in marshes and on bogs in several parts of *England*. The leaves of this are small, kidney-shaped, and smooth. The flowers are small, and of a pale blue colour; they appear in *June*, and are succeeded by small oblong capsules, filled with roundish seed.

The fourth sort grows naturally in *North America*. The leaves of this are spear-shaped, and deeply notched on their edges, standing upon short foot-stalks. The flowers are larger than those of the common sort, but have no scent.

The fifth sort is also a native of *North America*. The leaves of this are divided into seven parts or lobes, which are united at the foot-stalk. The flowers stand upon naked foot-stalks; they are of the Pansy kind, and have no scent; they appear in *June*, but are not succeeded by seeds here.

The sixth sort grows naturally in *Virginia*. The leaves of this are most of them divided into five lobes like the fingers of a hand, but some of the lower leaves are entire. The flowers are small, white, and have no scent.

The seventh sort grows naturally on the *Alps*; this was sent me by Dr. *Allione* from *Turin*; it is a very low plant, seldom rising two inches high. The leaves are small, and cut into winged points. The flowers are of a pale blue colour, and appear in *June*.

The eighth sort was sent me by the same gentleman, who found it growing on the *Alps*; this is also an humble plant, with oval, entire, uniform leaves, not more than half an inch long, and a quarter broad, standing upon short foot-stalks. The flowers are large, of a light blue colour, and appear in *June*. These have no scent.

The ninth sort grows naturally on the *Alps*, and the mountains in *Austria*. The root of this is perennial, but the stalks and leaves decay in autumn; it has erect stalks, which rise more than a foot high, garnished with oblong heart-shaped leaves. The flowers stand upon long foot-stalks, which spring from the wings of the stalks; they are shaped like those of the Dog Violet, and are of a pale blue colour; these appear the end of *May*, and are succeeded by roundish capsules, filled with small seeds, which ripen in *August*.

The tenth sort is the Hearts-ease or Pansies, which grows naturally in some of the northern counties of *England*, but is generally cultivated in gardens near *London*. Of this there are many varieties, which differ greatly in the size and colour of their flowers. Some of these varieties have very

large beautiful flowers, which have an agreeable odour; others have small flowers without scent; whether these are distinct species or accidental varieties, I have not been able to determine; for I have sowed the seeds of most of the varieties as carefully as possible, and have sown them separate, but have always had a mixture arise, which may have come from seeds lying in the ground; for in gardens, where these plants have been permitted to scatter their seeds, it is impossible to know how long the seeds may lie in the ground, and when they are turned up to the surface, they will grow, which renders it difficult to determine the specific differences of these plants in such places.

This is an annual plant, whose roots decay after they have flowered and perfected their seeds. The lower leaves are roundish or oblong, and are indented on their edges; the stalks rise seven or eight inches high, sending out many diffused branches, garnished with leaves, which are longer and narrower than those below, notched on their edges, and sit close to the branches. The flowers stand upon long naked foot stalks, which spring from the wings of the stalk, shaped like those of the common Violet. Some of the varieties have flowers much larger, and others are of the size of *March* Violets; some of them have the two upper petals of a deep yellow colour, with a purple spot in each, the two middle of a paler yellow with a deep yellow spot, and the lower petal of a velvet colour; in others the petals are white with yellow and purple spots; in some the yellow is the most prevailing colour, and in others the purple.

The eleventh sort grows naturally upon mountains in the north of *England* and in *Wales*; this has a perennial root, sending out shoots from the side, which spread and propagate, in which it differs from all the Pansies. The lower leaves are oblong and jagged; the stalks seldom rise more than four or five inches high; they decline, and are garnished with narrower leaves than those below, which are deeper cut on their sides. The flowers stand upon naked foot stalks two inches long; they are much larger than those of the common sort, and are of a deep yellow colour, with a few purple streaks in the center. This plant continues flowering great part of summer, but the flowers have no scent.

The common Violets are easily propagated by parting of their roots; this may be done at two seasons. The first or most common season for removing and parting of these roots is at *Michaelmas*, that the young plants may be well rooted before winter; this is generally practised where the plants are put on the borders of wood-walks in large plantations; but in the gardens where they are cultivated for their flowers, the gardeners transplant and part their plants, soon after their flowering season is over. These will have all the remaining summer to grow and get strength, so will produce a greater quantity of flowers the following spring than those which are removed in autumn; but this is not to be practised where they cannot be supplied with water till they have taken new root, unless in moist seasons.

Violets may also be propagated by seeds, which should be sown soon after they are ripe, which is about the end of *August*. The plants will come up the following spring, and when they are fit to remove, they should be transplanted in shady borders to grow till autumn, and then they may be planted where they are to remain; but the double-flowering Violets do not produce seeds. Although the white, blue, and purple Violets are generally supposed to be varieties which have accidentally sprung from seeds, yet I have several years sowed the seeds of all the three sorts, and have not found either of them vary.

The other sorts of Spring Violets are sometimes preserved in botanick gardens for the sake of variety; these may be propagated in the same way as the common sort, but require a moist soil and a shady situation.

The upright sort does not send out shoots like the common Violet, so increases but slowly by offsets; this may be propagated by seeds in plenty, and is as hardy as the common sort.

The several varieties of Pansies will scatter their seeds in a short time after the flowers are past; and from these self-sown seeds the plants, which come up in autumn, will flower very early in the spring, and these will be succeeded by the spring plants; so that where they are indulged in a garden, and their seeds are permitted to scatter, there will be a constant succession of their flowers the greatest part of the year, for they will flower all the winter in mild seasons, and most part of the summer in shady situations, which renders them worthy of a place in every good garden; but then they must not be allowed to spread too far, lest they become troublesome weeds, for their seeds, when ripe, are cast out of their covers with great elasticity to a considerable distance, and the plants will soon spread over a large space of ground, if they are permitted to stand.

The common Pansy stands in the *College Dispensatory* as a medicinal plant, but is rarely used in *England*.

The great yellow Violet propagates by offsets in pretty great plenty, if it has a moist soil and a shady situation; this may be transplanted in autumn, and the offsets may then be taken off; but the roots should not be divided into small heads, nor should they be too often transplanted, because they will not produce many flowers unless the plants are strong, and have good root in the ground. This sort will not live in a dry soil, nor in a situation much exposed to the sun.

VIORNA. See Clematis.

VIRGA AUREA. See Solidago.

VISCUM. *Tourn. Inst. R. H. 609. tab. 380.* Mistleto.

The Characters are,

It has male and female flowers upon separate plants. The male flowers have no petals, but have four summits, which are oblong and acute pointed, fastened to the leaves of the empalement. The female flowers have an empalement of four small oval leaves sitting upon the germen, but have no petals or stamina, with an oblong three-cornered germen, situated under the flower, having no style, but is crowned by an obtuse stigma. The germen afterward turns to a globular smooth berry with one cell, including a fleshy heart shaped seed.

We have but one Species of this genus in *Europe*, viz.

VISCUM foliis lanceolatis obtusis, caule dichotomo, spicis axillaribus. *Lin. Sp. Plant. 1033.* Mistleto with blunt spear-shaped leaves, stalks dividing by pairs, and spikes of flowers rising from the wings of the stalk.

This plant, instead of rooting and growing in the earth like other plants, fixes itself, and takes root on the branches of trees; it spreads out with many branches, and forms a large bush. The branches are ligneous; they have a yellow green bark; the largest is about the thickness of a man's finger; the other are gradually smaller, full of joints, which easily part asunder, at each of which grow two thick fleshy leaves, which are broad and rounded at their points, and narrow at their base. The flowers come out from the wings of the stalk in short spikes; they have four yellow leaves, which are by some called petals, and by others the empalement. The female flowers are succeeded by round white berries, which are almost pellucid, about the size of large white Currants, full of a rough viscid juice, in the middle of which lies one heart shaped flat seed.

It grows upon the white Thorn, the Apple, the Crab, the Hazel, the Ash, and Maple, but is rarely found upon the Oak, though the Mistleto of the last has been always accounted the best of all; which opinion, as Mr *Ray* well observe, may be owing to the superstitious honour the ancient *Druids* of this island gave to this Mistleto, to whom nothing was more sacred.

This plant is always produced from seed, and is not to be cultivated in the earth as most other plants, but will always grow upon trees, from whence the ancients accounted it a super-plant, most of whom thought it was an excrescence on the tree, without the seed being previously lodged there; which opinion is now generally confuted from a repeated number of experiments.

The manner of its being propagated is this, *viz.* the Mistle thrush, which feeds upon the berries in winter, when they are ripe, often carry the seeds from tree to tree; for the viscous part of the berry, which immediately surrounds the seed, doth sometimes fasten it to the outward part of the bird's beak, which, to get disengaged of, he strikes his beak against the branches of a neighbouring tree, and thereby leaves the seed sticking by this viscous matter to the bark, which, if it lights upon a smooth part of the tree, will fasten itself thereto, and the following winter will put out and grow; and in the same manner it may be propagated by art, for if the berries, when full ripe, are rubbed upon the smooth part of the bark of a tree, they will adhere closely thereto, and, if not destroyed, will produce plants the following winter.

The trees which this plant doth most readily take upon, are the Apple, the Ash, and other smooth-rinded trees before-mentioned; but I have several times tried it upon the Oak without success, for the bark of that tree is of too close a texture to admit the seeds sticking therein, which is also the reason it is so rarely found upon that tree; and notwithstanding the great encomiums which have been given to the Mistle of the Oak for its medicinal virtues, yet I cannot help thinking that it is equally good from whatever tree it be taken; nor is it possible to find this plant growing in any quantity upon the Oak; so that those persons, who pretend to furnish the town with it for physical use, do but impose upon the world, for it is so rarely met with, that whenever a branch of an Oak-tree hath any of these plants growing upon it, it is cut off, and preserved by the curious in their collections of natural curiosities, and of these there are but few to be seen in *England*.

As to what some persons have asserted of the manner how it is propagated from tree to tree, by the Mistle thrushes, which eat the berries and void the seed in their dung upon the branches of trees, whereby the seeds are stuck thereon, and take root into the bark and produce fresh plants, I can by no means agree to, since, if it were only this way propagated, it would always be found on the upper part or the sides of such branches, upon which the dung can only be supposed to lodge, whereas it is generally found upon the under side of branches, where it is almost impossible for these birds to cast their dung; besides, I believe the stomachs of these birds are too powerful digesters, to suffer any seeds to pass so entire through the intestines as to afterwards grow, but I shall leave this to such as have leisure to make observations in those places where this plant abounds.

Of the berries of this plant birdlime was formerly made in *England*. This was done by boiling the berries in water till they burst, when they were well beaten in a mortar, and afterward washed till all the branny husks were cleared away.

VISNAGA. See Daucus.

VITEX *Tourn. Inst. R. H.* 603. *tab.* 373. Agnus Castus, or the Chaste-tree.

The Characters are,

The empalement of the flower is cylindrical, and indented in *five* parts. The flower has one ringent petal; the brim is plain, and divided into two lips, which are trifid; the middle segment is the broadest in both. It has four hair-like stamina, two being shorter than the other, terminated by moveable summits, and a roundish germen, supporting a slender style, crowned by two awl-

shaped spreading stigmas. The germen afterward turns to a globular berry with four cells, each containing one oval seed.

The Species are,

1. VITEX *foliis digitatis, spicis verticillatis.* *Lin. Sp. Plant.* 938. Chaste-tree with fingered leaves, and whorled spikes of flowers; or common Chaste-tree.

2. VITEX *foliis digitatis serratis, spicis paniculatis.* Chaste-tree with fingered sawed leaves, and spikes in panicles; Chaste-tree with a broader sawed leaf.

3. VITEX *foliis ternatis quinatisque, paniculis dichotomis.* *Lin. Sp. Plant.* 938. Chaste-tree with trifoliate and quinate leaves, and panicles of flowers rising from the division of the branches; smaller *Indian* Chaste-tree.

4. VITEX *foliis ternatis quinatisque pinnato-incisis, spicis verticillatis terminalibus.* Chaste tree with ternate and quinate leaves which are cut like wings, and whorled spikes of flowers terminating the branches.

The first sort grows naturally in *Sicily*, near *Naples*, by the sides of rivers, and in the *Archipelago* in moist places; it has a shrubby stalk ten or twelve feet high, sending out branches opposite the whole length, which are angular, pliable, and have a grayish bark, garnished with leaves for the most part placed opposite, composed of five, six, or seven lobes which unite at the foot-stalk, and spread out like the fingers of a hand, ending in blunt points, of a dark green on their upper side, but hoary on their under. The flowers are produced in spikes at the extremity of the branches, from seven to fifteen inches long, disposed in whorls round the stalks, with intervals between each whorl; they are of the lip kind; the two lips are each cut into three segments, the middle being larger than the two sides; in some plants white, and in others blue; these are generally late before they appear, so that in bad seasons they do not open fair. The flowers have an agreeable odour, and make a good appearance in autumn, when the flowers of most other shrubs are gone, for in warm mild seasons I have seen these shrubs in full flower the middle of *October*.

The second sort grows naturally in the south of *France*, and in *Italy*; this is a lower shrub than the first; it seldom rises more than four or five feet high, coming up with several stalks from the root, which do not branch so much as the former; their bark is also whiter. The leaves are fingered, and composed of five or seven lobes which unite at the foot-stalk; these are not so disproportionate in their length, are sawed on their edges, and are not so stiff as those of the former. The flowers come out in paniced spikes toward the end of the branches; the spikes are shorter, and the flowers smaller than those of the first sort, and appear sooner; they are all of them blue which I have seen.

The third sort grows naturally in both *Indies*; this has a shrubby stalk, which rises nine or ten feet high, sending out many side branches which have a brown bark, garnished with leaves which have sometimes three, and at others five, oval acute-pointed lobes which are entire, and a little downy on their under side. The flowers are disposed in panicles which arise at the division of the branches; these are small and white, but are not succeeded by any seeds in *England*.

The fourth sort grows naturally in the northern parts of *China*, where it rises with woody stalks eight or ten feet high, having a gray bark. The branches come out opposite, garnished with leaves placed opposite upon long foot-stalks; these are composed of three or five spear-shaped lobes, which are deeply sawed on their edges, and end in very acute points, of a dark green on their upper side, but grey on their under. The flowers are disposed in whorled spikes, which come out opposite from the wings of the stalk; these are blue, and about the size of those of the first.

The first sort is pretty common in many *English* gardens, where it has been long an inhabitant, but was not much propagated till of late years. The second sort is less common, and only in some curious gardens at present. These plants are very hardy, and may be propagated by planting their cuttings early in the spring before they shoot; they require a fresh light soil, and must be frequently refreshed with water until they have taken root; after which they must be carefully cleared from weeds during the summer season, and if the following winter prove severe, you must lay a little mulch upon the surface of the ground between the plants, to prevent the frost from penetrating to their roots, which would injure them while they are young; and as these cuttings are apt to shoot late in the year, their tops will be very tender, and the early frosts in autumn often kill them down a considerable length, if they are not protected, therefore they should then be covered with mats, which will be of great service to them. Toward the middle of *March*, if the season is favourable, you should transplant them either into the places where they are designed to remain, or into a nursery to grow two or three years to get strength, where they must be pruned up, in order to form them into regular stalks, otherwise they are very subject to shoot out their branches in a straggling manner.

They may also be propagated by laying down their branches in the spring of the year, in doing of which you must be very careful not to break them, for their shoots are very apt to split if they are much forced; these will take root in one year, provided they are watered in very dry weather, and may then be transplanted out, and managed, as was directed for those plants raised from cuttings.

The third sort is too tender to live in the open air in *England*, so must be planted in pots, and constantly kept in the stove; it is propagated both by cuttings and layers, but the cuttings of this must be planted in pots, and plunged into a moderate hot-bed, covering them close with a bell or hand-glass, to exclude the air; they should be refreshed with water now and then, but it must not be given them too freely. The best time to plant the cuttings is about the middle or latter end of *April*, for if they succeed they will put out roots in six or seven weeks, and will then begin to shoot, so they should have the free air gradually admitted to them, to prevent their shooting weak; then they may be carefully taken up, and each planted in a separate small pot filled with light earth, and plunged into the hot-bed again, shading them from the sun till they have taken new root, after which they should have plenty of free air at all times when the weather is good, treating them in the same manner as other tender plants. In winter they must be kept in a moderate temperature of heat, but in the summer they should have the free air in mild weather, but not removed into the open air.

The fourth sort has been lately introduced into the *English* gardens from *Paris*, where the plants were raised from seeds, which were sent from *China* by the missionaries. I was favoured with some young plants by Monsieur *Richard*, gardener to the king at *Versailles*. The two sorts with white and blue flowers have succeeded in the *Chelsea* garden, but that with red flowers was injured in the way and miscarried.

This is propagated by cuttings, which must be planted in the spring in pots, plunging them into a moderate hot-bed, and, when the cuttings are well rooted, they should be carefully taken up, and each planted in a separate small pot filled with light earth, and placed in the shade until they have taken new root; then they may be removed to a sheltered situation, placing them with other green-house plants, where they may remain all the summer; but in autumn they must be put into shelter, for they will not live in

the open air in this country; but as they cast their leaves early in autumn, so they must not have much wet in winter. The plants are late in putting out new leaves in the spring, and, before these appear, they have so much the appearance of dead plants, that they have been turned out of the pots by some, supposing they were so.

VITIS. *Tourn. Inst. R. H.* 613. tab. 384. The Vine.

The Characters are,

The flower has a small empalement indented in five parts; it has five small petals which drop off, and five awl-shaped stamina, which spread and fall away, terminated by single summits, with an oval germen having no style, crowned by a headed obtuse stigma. The germen afterward turns to an oval or roundish berry with one cell, including five hard seeds or stones.

I shall not trouble the reader with an enumeration of all the sorts of Grapes which are at present known in *England*, which would swell this work much beyond its intended bulk, and be of little use, since many of them are not worth the trouble of cultivating; so I shall only select those which ripen well in this country, or that merit a little assistance to bring them to perfection by artificial heat.

The *July Grape*; this is called by the *French*, *Morillon noir batif*, is a small, round, black berry, growing loose on the bunches. The juice is sugary, but has little flavour, and has no merit but that of ripening early. It ripens the beginning of *August*.

The black Sweet Water is a small roundish berry, growing close in the bunches, which are short. The skin is thin, the juice very sweet, and the birds and flies are very apt to devour them if they are not guarded. It ripens soon after the other.

The white Sweet Water is a large round berry when in perfection, but these are very different in size on the same bunch; some of them will be of a large size, and others extremely small, for which reason it is not much esteemed. The juice is sugary, but not vinous. This ripens about the same time with the former.

The *Chasselas Blanc*, or Royal Muscadine, as it is called by some, is an excellent Grape, the bunches are generally large, and at the upper part divide with two smaller side bunches or shoulders. The berries are round, and, when perfectly ripe, turn of an amber colour. The juice is rich and vinous; it ripens in *September*, but, if carefully preserved, they will hang very late and become excellent.

The *Chasselas Musque*, or *Le Cour Grape*, as it is here called, by some called the *Frankindal*, is an excellent Grape, and generally ripens well in *England*, if it has a good aspect wall. The berries are very like those of the former in shape, size, and colour, but are fleshy and have a little musky flavour. It ripens at the same time with the former.

The black Cluster, or *Munier Grape*, as it is called by the *French*, from the hoary down of the leaves in summer, is a good fruit, and ripens well here. The bunches are short, the berries are oval, and are very close to each other, so that many of those which grow on the inside continue green when the outer are perfectly ripe. It ripens in *September*, and is by some called the *Burgundy Grape*.

The *Auverna*, or true *Burgundy Grape*, sometimes called black *Morillon*, is an indifferent fruit for the table, but is esteemed one of the best sorts for making wine. The berries of this are oval, and hang looser on the bunches than those of the Cluster Grape, so ripen equally, which gives it the preference.

The *Corinth*, or as it is vulgarly called the *Currant Grape*, is a small roundish berry, generally without stone, of a deep black colour, and much clustered on the bunches, which are short; it has a sugary juice, and ripens in *September*, but will not last long.

The red *Chaffelas* is very like the white in size and shape, but is of a dark red colour; it is a very good grape, but ripens later than the white, and is pretty rare in *England*.

The white Muscadine is somewhat like the *Chaffelas*, but the berries are smaller, and hang looser on the bunches, which are longer, but not so thick as those of the *Chaffelas*. The juice is sweet, but not so rich as the *Chaffelas*.

The black *Frontinac*, or *Muscat noir*, is a round berry of good size; they grow loose on the bunches, yet do not ripen equally. The bunches are short, the berries when fully ripe are very black, and are covered with a meal or flue, like the black plumbs. The juice of this is very rich and vinous. It ripens the end of *September*, or the beginning of *October*.

The red *Frontinac*, or *Muscat rouge*, is an excellent Grape when fully ripe, but unless the season proves very warm, they rarely ripen without artificial heat in *England*. The bunches of this sort are longer than those of the former; the berries are large and round; when they are fully ripe they are of a brick colour, but before they are grey with a few dark stripes, and this is frequently taken for a different kind, and is commonly called grisley *Frontinac*; but I am convinced it is the same Grape. The juice of this has the most vinous flavour of all the sorts, and is greatly esteemed in *France*.

The white *Frontinac* has larger bunches than either of the former; the berries are round, and are so closely clustered on the bunches, as that unless they are carefully thinned early in the season, when the berries are very small, the sun and air will be excluded from many of them, so that they will not ripen, and the moisture will be detained in the autumn, which will cause them to rot. The juice of this is excellent, and if the fruit is perfectly ripe is inferior to none. This the *French* call *Muscat blanc*.

The *Alexandrian Frontinac*, or *Muscat d'Alexandrie*, is by some called *Muscat* of *Jerusalem*. The berries of this are oval, and hang loose on the bunches; these are long and are not shouldered. There are two sorts, one with white and the other has red berries; their juice is very rich and vinous, but they seldom ripen in *England* without artificial heat.

The red and black *Hamburgh*, by some called the *Warner* Grape, from the person who brought it to *England*. These have middle-sized berries inclining to an oval shape. The bunches are large, and their juice when ripe is sugary, with a vinous flavour. This ripens in *October*.

The *St. Peter's* Grape has a large oval berry of a deep black colour when ripe. The bunches are very large, and make a fine appearance at the table, but the juice is not rich, and it ripens late in the year. The leaves of this sort are much more divided than those of the other sorts, approaching to those of the Parsley-leaved Grape, so it may be distinguished before the fruit is ripe.

The *Claret* Grape, *Bourdelais*, or *Verjuice* Grape, the *Raisin* Grape, the striped Grape, and many other sorts which never come to perfection here, are not worthy of a place in gardens, unless for the sake of variety; for when they have the assistance of heat to bring them to maturity, their juice is harsh, and without flavour, so they should not occupy the room of better fruit.

All the sorts of Grapes are propagated either from layers or cuttings, the former of which is greatly practised in *England*, but the latter is what I would recommend, as being much preferable to the other; for the roots of Vines do not grow strong and woody, as in most sorts of trees, but are long, slender, and pliable; therefore when they are taken out of the ground they seldom strike out any fibres from the weak roots, which generally shrivel and dry; so that they rather retard than help the plants in their

growth, by preventing the new fibres from pushing out; for which reason I had rather plant a good cutting than a rooted plant, provided it be well chosen, for there is little danger of its growing.

But as there are few persons who make choice of proper cuttings, or at least that form their cuttings rightly in *England*, so it will be proper to give directions for this in the first place, before I proceed. You should always make choice of such shoots as are strong and well ripened of the last year's growth; these should be cut from the old Vine, just below the place where they were produced, taking a knot, or piece of the two-years wood to each, which should be pruned smooth; then you should cut off the upper part of the shoots, so as to leave the cutting about sixteen inches long. When the piece or knot of old wood is cut at both ends, near the young shoot, the cuttings will resemble a little mallet; from whence *Columella* gives the title of *Malleolus* to the Vine-cuttings. In making the cuttings after this manner, there can be but one taken from each shoot; whereas most persons cut them into lengths of about a foot, and plant them all, which is very wrong, for the upper part of the shoots are never so well ripened as the lower, which was produced early in the spring, and has had the whole summer to harden; so that if they take root, they never make so good plants; for the wood of those cuttings being spongy and soft, admits the moisture too freely, whereby the plants will be luxuriant in growth, but never so fruitful as such whose wood is closer and more compact.

When the cuttings are thus prepared, if they are not then planted, they should be placed with their lower part in the ground in a dry soil, laying some litter upon their upper parts to prevent them from drying: in this situation they may remain till the beginning of *April*, (which is the best time for planting them) when you should take them out, and wash them from the filth they have contracted; and if you find them very dry, you should let them stand with their lower parts in water six or eight hours, which will distend their vessels, and dispose them for taking root. Then the ground being before prepared where the plants are designed to remain (whether against walls or for standards, for they should not be removed again) the cuttings should be planted; but in preparing the ground you should consider the nature of the soil, which, if strong, and inclinable to wet, is by no means proper for Grapes; therefore where it so happens, you should open a trench where the cuttings are to be planted, which should be filled with lime-rubbish, the better to drain off the moisture; then raise the border with fresh light earth about two feet thick, so that it may be at least a foot above the level of the ground; then you should open the holes at about six feet distance from each other, putting one good strong cutting into each hole, which should be laid a little sloping, that their tops may incline to the wall; but it must be put in so deep, as that the uppermost eye may be level with the surface of the ground; for when any part of the cutting is left above ground, as is the common method used by the *English* gardeners, most of the buds attempt to shoot, so that the strength of the cuttings is divided to nourish so many shoots, which must consequently be weaker than if only one of them grew; whereas, on the contrary, by burying the whole cutting in the ground, the sap is all employed on one single shoot, which consequently will be much stronger; besides, the sun and air are apt to dry that part of the cutting which remains above ground, and so often prevents their buds from shooting.

Then having placed the cutting into the ground, you should fill up the hole gently, pressing down the earth with your foot close about it, and raise a little hill just upon the top

top of the cutting, to cover the upper eye quite over, which will prevent it from drying; this being done, there is nothing more necessary but to keep the ground clear from weeds until the cuttings begin to shoot; at which time you should look over them carefully, to rub off any small shoots, if such are produced, fastening the first main shoot to the wall, which should be constantly trained up, as it is extended in length, to prevent its breaking or hanging down; you must continue to look over these once in about three weeks during the summer season, constantly rubbing off all lateral shoots which are produced; and be sure to keep the ground constantly clear from weeds, which, if suffered to grow, will exhaust the goodness of the soil and starve the cuttings.

The *Michaelmas* following, if your cuttings have produced strong shoots, you should prune them down to two eyes, which, though by some people may be thought too short, yet I am satisfied, from several experiments, to be the best method. The reason for advising the pruning vines at this season, rather than deferring it till spring, is, because the tender parts of those young shoots, if left on, are subject to decay in winter, for they are apt to grow late in the year, so the tops of their shoots are tender, and the early frosts will pinch them, and then they are frequently killed down a considerable length, which weakens their roots; but if they are cut off early in autumn, the wounds will heal over before the bad weather, and thereby the roots will be greatly strengthened.

In the spring, after the cold weather is past, you must gently dig up the borders to loosen the earth; but you must be very careful in doing this, not to injure the roots of your Vines; you should also raise the earth up to the stems of the plants, so as to cover the old wood, but not so deep as to cover either of the eyes of the last year's wood. After this they will require no farther care until they begin to shoot, when you should look over them carefully, to rub off all weak dangling shoots, leaving no more than the two shoots, which are produced from the two eyes of the last year's wood, which should be fastened to the wall; and so from this, until the Vines have done shooting, you should look them over once in three weeks or a month, to rub off all lateral shoots as they are produced, and to fasten the main shoots to the wall as they are extended in length, which must not be shortened before the middle or latter end of *July*, when it will be proper to nip off their tops, which will strengthen the lower eyes, and during the summer season you must constantly keep the ground clear from weeds; nor should you permit any sort of plants to grow near the Vines, which would not only rob them of nourishment, but shade the lower parts of the shoots, and thereby prevent their ripening; which will not only cause their wood to be spongy and luxuriant, but render it less fruitful.

As soon as the leaves begin to drop in autumn, you should prune these young Vines again, leaving three buds to each of the shoots, provided they are strong; otherwise it is better to shorten them down to two eyes if they are good, for it is a very wrong practice to leave much wood upon young Vines, or to leave their shoots too long, which greatly weakens the roots; then you should fasten them to the wall, spreading them out horizontally each way, that there may be room to train the new shoots the following summer, and in the spring the borders as before.

The third season you must go over the Vines again, as soon as they begin to shoot, to rub off all danglers as before, and train the strong shoots in their proper places, which this year may be supposed to be two from each shoot of last year's wood; but if they attempt to produce two shoots from one eye, the weakest of them must be rubbed off, for there should never be more than one al-

lowed to come out of each eye. If any of them produce fruit, as many times they will the third year, you should not stop them so soon as is generally practised upon the bearing shoots of old Vines, but permit them to shoot forward till a month after *Midsummer*, at which time you may pinch off the tops of the shoots; for if this were done too soon, it would spoil the buds for the next year's wood, which in young Vines must be more carefully preserved than on older plants, because there are no other to be laid in for a supply of wood, as is commonly practised on old Vines.

During the summer you must constantly go over your Vines, and displace all weak lateral shoots as they are produced, and carefully keep the ground clear from weeds, as was before directed, that the shoots may ripen well, which is a material thing to be observed in most sorts of fruit-trees, but especially in Vines, which seldom produce any fruit from immature branches. These things being duly observed, are all that is necessary in the management of young Vines; I shall therefore proceed to lay down rules for the government of grown Vines, which I shall do as briefly as possible. And,

First, Vines rarely produce any bearing shoots from wood that is more than one year old, therefore great care should be taken to have such wood in every part of the trees; for the fruit are always produced upon the shoots of the same year, which come out from buds of the last year's wood. The method commonly practised by the gardeners in *England* is, to shorten the branches of the former year's growth down to three or four eyes, at the time of pruning; though there are some persons who leave these shoots much longer, and affirm, that by this practice they obtain a greater quantity of fruit; but however this may be, it is a very wrong practice, since it is impossible that one shoot can nourish forty or fifty bunches of Grapes, so well as it can ten or twelve, so that what is gotten in number is lost in their magnitude; besides, the greater quantity of fruit there is left on Vines, the later they are ripened, and their juice is not so rich; and this is well known in the wine countries, where there are laws enacted to direct the number and length of shoots that are to be left upon each Vine, lest by over-bearing them, they not only exhaust and weaken the roots, but thereby render the juice weak, and so destroy the reputation of their wine.

Wherefore the best method is to shorten the bearing shoots to about four eyes in length, because the lowermost seldom is good, and three buds are sufficient, for each of these will produce a shoot, which generally has two or three bunches of Grapes; so that from each of those shoots there may be expected six or eight bunches, which is a sufficient quantity. These shoots must be laid about eighteen inches asunder; for if they are closer, when the side shoots are produced, there will not be room enough to train them against the wall, which should always be provided for; and as their leaves are very large, the branches should be left at a proportionable distance from each other, that they may not crowd or shade the fruit.

At the winter-pruning of your Vines you should always observe to make the cut just above the eye, sloping it backward from it, that if it should bleed the sap might not flow upon the bud; and where there is an opportunity of cutting down some young shoots to two eyes, in order to produce vigorous shoots for the next year's bearing, it should always be done; because in stopping those shoots which have fruit upon them as soon as the Grapes are formed, which is frequently practised, it often spoils the eyes for producing bearing branches the following year, and this reserving of new wood is what the *Vignerons* abroad always practise in their vineyards. The best season for pruning of Vines is

about the middle or end of *October*, for the reasons before laid down.

The latter end of *April*, or the beginning of *May*, when the Vines begin to shoot, you must carefully look them over, rubbing off all small buds which may come from the old wood, which only produce weak dangling branches; as also when two shoots are produced from the same bud, the weakest of them should be displaced, which will cause the others to be stronger; and the sooner this is done, the better it is for the Vines.

In the middle of *May* you must go over them again, rubbing off all the dangling shoots as before; and at the same time you must fasten up all the strong branches, so that they may not hang from the wall; for if their shoots hang down, their leaves will be turned with their upper surfaces the wrong way, and when the shoots are afterwards trained upright, they will have their under surface upward, and until the leaves are turned again, and have taken their right position, the fruit will not thrive, so that the not observing this management, will cause the Grapes to be a fortnight or three weeks later before they ripen; besides, by suffering the fruit to hang from the wall, and be shaded with the closeness of the branches, it is greatly retarded in its growth; therefore, during the growing season, you should constantly look over the Vines, displacing all dangling branches and wild wood which come from the side of the buds, and fasten up the other shoots regularly to the wall, as they are extended in length, and towards the middle of *June* you should stop the bearing branches, which will strengthen the fruit, provided you always leave three eyes above the bunches; for if you stop them too soon it will injure the fruit, by taking away that part of the branch which is necessary to attract the nourishment to the fruit, as also to perspire off the crudities of the sap, which is not proper for the fruit to receive.

But although I recommend the stopping those shoots which have fruit at this season, yet this is not to be practised upon those shoots which are intended for bearing the next year, for these must not be stoppt before the middle of *July*, lest, by stopping them too soon, you cause the eyes to shoot out strong lateral branches, whereby they will be greatly injured.

During the summer season you should be very careful to rub off all dangling branches, and train up the shoots regularly to the wall as before, which will greatly accelerate the growth of the fruit, and also admit the sun and air to them, which is absolutely necessary to ripen, and give the fruit a rich flavour; but you must never divest the branches of their leaves, as is the practice of some persons, for although the admitting of the sun is necessary to ripen them, yet if they are too much exposed thereto, their skins will be tough, and they will rarely ripen; besides, the leaves being absolutely necessary to nourish the fruit, by taking them off the fruit is starved, and seldom comes to any size, as I have several times observed; therefore a great regard should be had to the summer management of the Vines, where persons are desirous to have their fruit excellent, and duly ripened.

When the fruit are all gathered you should prune the Vines, whereby the litter of their leaves will be entirely removed at once, and their fruit will be the forwarder the succeeding year, as has been before observed.

As many of the richest and best sorts of Grapes will not ripen in *England*, unless the season proves very warm, or the soil and situation are very favourable, there have been many hot-walls built to accelerate the ripening of this fruit, and bring it to full perfection by artificial heat, and as these succeed very well, when they are properly contrived, and the Vines rightly managed, I shall here give proper directions, which, if duly attended to, will be sufficient to instruct persons in both.

The method of building hot-walls will be treated under the article WALL, so I shall pass it over in this place, and proceed to the preparing of the ground for planting. The borders against these hot-walls should have the earth taken out two feet deep (provided the ground is dry), otherwise one foot will be sufficient, because in wet land the borders should be raised at least two feet above the level of the ground, that the roots of the Vines may not be injured by the wet. When the earth is taken out, the bottom of the trench should be filled with stones, lime-rubbish, &c. a foot and a half or two feet thick, which should be levelled and beaten down pretty hard, to prevent the roots of the Vines from running downward. The trenches should be made five feet wide at least, otherwise the roots of the Vines will in a few years extend themselves beyond the rubbish, and, finding an easy passage downwards, will run into the moist ground, and thereby imbibe so much wet, as to lessen the vinous flavour of the Grapes; but before the rubbish is filled into the trench, it is a better method to raise a nine inch wall, at five feet distance from the back wall, which will keep the rubbish from intermixing with the neighbouring earth, and also confine the roots of the Vines to the border in which they are planted, so that they cannot reach to the moist ground. This nine inch wall should be raised to the height of this intended border, so will be of great use to lay the plate of timber of the frames upon, which will be necessary to cover the Vines when they are forced, whereby the timbers will be better preserved from rotting; and where the borders are raised to any considerable height above the level of the ground, they should be a brick and a half thick; these walls will preserve the borders from falling down into the walks, but in carrying up these walls it will be proper to leave little openings, about eight or ten feet distance, to let the water pass off, because when the rubbish at the bottom of the trench unites and binds very hard, the water cannot easily find a passage through it; therefore it will be the better method to leave these small passages in the wall, lest the moisture being confined at the bottom, should be pent up as in a ditch, which will be of ill consequence to the Vines.

When the walls are finished and thoroughly dry, the rubbish should be filled in, as before directed; then there should be fresh earth laid upon it two feet thick, which will be a sufficient depth of soil for the Vines to root in. These borders should be thus prepared at least a month or six weeks before the Vines are planted, that they may have time to settle. The best time to plant them is about the end of *September*, or the beginning of *October*, if planted with rooted plants, for when these are removed in the spring, their roots are very subject to bleed, which will greatly weaken them. The distance these Vines should be allowed to remain is the same as for common walls, *i. e.* about six feet; afterward lay a little mulch on the surface of the ground about their roots, to prevent the sun and air from drying the earth, and if the following spring should prove very dry, they should have some water once a week, which will be as often as they require it, for nothing will destroy them sooner than too much water.

The management of these Vines, for the three first years after planting, being the same as is practised for those against common walls, I shall not repeat it in this place, having fully treated of that already, only will observe that, during these three years, the Vines should be encouraged as much as possible, and the shoots not left too long, nor too many in number on each root, that they may be duly ripened and prepared for bearing the fourth year, which is the soonest they should be forced; for when any sort of fruit-trees are forced by fire too young, they seldom continue long in health, so that what fruit they produce is small,

and not well-flavoured; therefore, in being over hasty to save a year or two, very often the whole design miscarries; for unless the trees are in a proper condition to bear much fruit, it is not worth while to make fires for a small quantity of starved ill-tasted fruit, the expence and trouble being the same for ten or twelve bunches of Grapes, as it will be for a hundred or more.

These Vines should not be forced every year, but with good management they may be forced every other year, though it would be better, if it were done only every third year; therefore, in order to have a supply of fruit annually, there should be a sufficient quantity of walling built, to contain as many Vines as will be necessary for two or three years, and by making the frames in front moveable, they may be shifted from one part of the wall to another, as the Vines are alternately forced; therefore I would advise about forty feet length of walling to be each year forced, which is as much as one fire will heat, and when the Vines are in full bearing, will supply a reasonable quantity of Grapes for a middling family, but for great families twice this length will not be too much.

In most places where these hot-walls have been built, they are commonly planted with early kinds of Grapes, in order to have them early in the season; but this, I think, is hardly worth the trouble, for it is but of little consequence to have a few Grapes earlier by a month or six weeks than those against common walls; therefore I should advise, whenever a person is willing to be at the expence of these walls, that they may be planted with some of the best kinds of Grapes, which rarely come to any perfection in this country without the assistance of some artificial heat, of which the following sorts are the most valuable.

The red Muscat of *Alexandria*.

The white Muscat of *Alexandria*.

The red *Frontinac*.

The white *Frontinac*.

The black *Frontinac*.

When the Vines which are planted against the hot-walls are grown to full bearing, they must be pruned and managed after the same manner as hath been directed for those against common walls, with this difference only, *viz.* that those seasons when they are not forced, the Vines should be carefully managed in the summer, for a supply of good wood against the time of their being forced; so that it will be the better method to divest the Vines of their fruit, in order to encourage the wood, for as these sorts will not ripen without heat, it is not worth while to leave them on the Vines during the season of resting, except it be the common *Frontinac*, which in a good season will ripen without artificial heat; but, even these, I would not advise many Grapes to be left on them during the years of their resting, because as the design of this is to encourage and strengthen them, therefore all possible care should be had, that the young wood is not robbed by overbearing; for those years when the Vines are forced, the joints of the young wood are generally drawn farther asunder than they ordinarily grow in the open air, so that when they are forced two or three years successively, the Vines are so much exhausted, as not to be recovered into a good bearing state for some years, especially if they are forced early in the season, or where great care is not taken in the summer to let them have a proper share of free air, to prevent their being drawn too much, and also to ripen their shoots. Those years when the Vines are forced, the only care should be to encourage the fruit, without having much regard to the wood, so that every shoot should be pruned for fruit, and none of them shortened for a supply of young wood, because they may be so managed by pruning in the years of their resting, as to replenish the Vines with new wood. Those Vines which

are designed for forcing in the spring, should be pruned early the autumn before, that the buds which are left on the shoots, may receive all possible nourishment from the root, and at the same time the shoots should be fastened to the trellis in the order they are to lie, but the glasses should not be placed before the Vines till about the middle or end of *January*, at which time also the fires must be lighted; for if they are forced too early in the year, they will begin to shoot before the weather will be warm enough to admit air to the Vines, which will cause the young shoots to draw out weak, and thereby their joints will be too far asunder, so consequently there will be fewer Grapes on them, and those bunches which are produced will be smaller, than when they have a sufficient quantity of air admitted to them every day.

If the fires are made at the time before directed, the Vines will begin to shoot the latter end of *February*, which will be six weeks earlier than they usually come out against the common walls, so that by the time that other Vines are shooting these will be in flower, which will be early enough to ripen any of these sorts of Grapes perfectly well. The fires should not be made very strong in these walls, for if the air is heated to about ten degrees above the temperate point, on the botanical thermometers, it will be sufficiently warm to force out the shoots leisurely, which is much better than to force them violently. These fires should not be continued all the day time, unless the weather should prove very cold, and the sun does not shine to warm the air, at which times it will be proper to have small fires continued all the day, for where the walls are rightly contrived, a moderate fire made every evening, and continued till ten or eleven of the clock at night, will heat the wall, and warm the inclosed air to a proper temperature; and as these fires need not be continued longer than about the end of *April* (unless the spring should prove very cold), so the expence of fuel will not be very great, because they may be contrived to burn either coal, wood, turf, or almost any other sort of fuel, though where coal is to be had reasonable, it makes the event and best fires, and will not require much attendance.

When the Vines begin to shoot they must be frequently looked over to fasten the new shoots to the trellis, and to rub off all dangling shoots; in doing of which great care must be taken, for the shoots of these forced Vines are very tender, and very subject to break when any violence is offered. They should also be trained very regular, so as to lie as near as possible at equal distances, that they may equally enjoy the benefit of the air and sun, which is absolutely necessary for the improvement of the fruit. When the Grapes are formed, the shoots should be stopped at the second joint beyond the fruit, that the nourishment may not be drawn away from the fruit, which must be avoided as much as possible in these forced Vines, upon which no useless wood should be left, which will shade the fruit, and exclude the air from it by their leaves.

As the season advances and the weather becomes warm, there should be a proportionable share of free air admitted to the Vines every day, which is absolutely necessary to promote the growth of the fruit, but the glasses should be shut close every night, unless in very hot weather, otherwise the cold dews in the night will retard the growth of the fruit. The bunches of the white *Frontinac* should also be carefully looked over, and the small Grapes cut out with very narrow-pointed scissars, in order to thin them, for these berries grow so close together on the bunches, that the moisture is detained between them, which often occasions their rotting, and the air being excluded from the middle of the bunches the Grapes never ripen equally, which by this method may be remedied, if done in time; and as these

Grapes are protected by the glasses from the blights which frequently take those which are exposed, there will be no hazard in thinning these Grapes soon after they are set; at which time it will be much easier performed than when the Grapes are grown larger, and consequently will be closer together; but in doing of this the bunches must not be roughly handled, for if the Grapes are the least bruised, or the farina, which there naturally is upon them, be rubbed off, their skins will harden and turn of a brown colour, so the fruit will never thrive after; therefore the scissars which are used for this purpose, should have very narrow points, that they may be more easily put between the Grapes, without injuring the remaining ones. The other sorts of Grapes, which I have recommended for these hot-walls, do not produce their fruit so close together on the bunches, so they will not require this operation, unless by any accident they should receive a blight, which often occasions a great inequality in the size of the Grapes, which, whenever it thus happens, will require to be remedied by cutting off the small Grapes, that the bunches may ripen equally, and appear more sightly.

By the middle of *June* these Grapes will be almost full-grown, therefore the glasses may be kept off continually in the day time, unless the season should prove very cold and wet; in which case they must be kept on, and only opened when the weather is favourable; for as the racy vinous flavour of these fruits is increased by a free air, so, during the time of their ripening, they should have as large a share as the season will admit to be given them.

Before the Grapes begin to ripen, they must be carefully guarded against birds, wasps, and other insects, otherwise they will be destroyed in a short time; to prevent which, the Vines should be carefully covered with nets, so as to exclude the birds, who make great havock with the Grapes, by breaking their skins; and if there are a few twigs covered with birdlime, placed here and there on the outside of the nets, it will be of service, because the birds are often so bold as to attempt to break the nets to get to the Grapes, which, if they attempt, they may be so entangled on these twigs as not to get loose; and whenever that happens, they should not be disengaged, but suffered to remain to keep off their companions; and if they get off themselves, it will have the desired effect, for there will few other birds come to the same place that season, as I have more than once experienced.

As to the wasps, the best method is to hang up some phials about half filled with sugared water, and rub the necks of the phials with a little honey, which will draw all the wasps and flies to them, which, by attempting to get at the liquor, will fall into the phials and be drowned; these phials should be carefully looked over once in three or four days to take out the wasps, and destroy them, and to replenish the phials with liquor. If this be duly observed, and the phials placed in time, before the Grapes are attacked, it will effectually prevent their being injured; but where these precautions are not taken, the Grapes will be in danger of being absolutely destroyed, for as the early Grapes will ripen long before any others against common walls, they will be in much more danger, there being no other fruit for them at that season in the neighbourhood; whereas, when Grapes in general begin to ripen, there is a quantity in almost every garden; so that if they destroy a part in each garden, yet there will be a greater chance to have some escape, than where there is only one wall for them to attack.

These sorts of Grapes, being forced in the manner before directed, will begin to ripen early in *August*, especially the Black and Red *Frontinacs*, which will be fit for the table a fortnight earlier than the other sorts; but, as the design of

forcing them is to have them in as great perfection as possible in this climate, they should not be gathered until they are thorough ripe, for which reason some of the later sorts should be left on the Vines till *September*; but then the glasses should be kept over them in wet and cold weather, to protect the fruit from it; but whenever the weather is fair, the glasses must be opened to let in the free air, otherwise the damps arising from the earth at that season, will cause a mouldiness upon the Grapes, which will rot them; so that if the season should prove very cold and wet, while the fruit are upon the Vines, it will be proper to make a small fire every night to dry off the damps, and prevent this injury. Most people in *England* gather their Grapes too soon, never suffering them to remain on the Vines to ripen perfectly, even in the warmest seasons, when, if they are left on till after *Michaelmas*, they will be good.

Of late years many persons have planted Grapes against espaliers, which in some places have succeeded very well in good seasons; but if they are not planted in a good soil and to a proper aspect, and the sorts rightly chosen, they seldom produce any fruit which are fit to be eaten. The soil proper to plant Vines in espaliers, should be the same as is hereafter directed for vineyards, *viz.* either a chalky, or gravelly bottom, with about a foot and a half, or two feet of light hazel earth on the top, a little sloping to the south, or south-east, that the wet may easily find a passage, so as not to remain on the ground. In such a soil situated to the sun, and screened from cold winds, there are several sorts of Grapes, which in warm seasons will ripen very well in *England*.

But there are some curious persons who line the back-side of their espaliers with low Reed-hedges, and others who do it with thin slit deals; both of which are a good defence to the Vines against blights in the spring, and accelerate the ripening of the Grapes; so that in tolerable seasons they will come to good maturity. Neither of these methods are very expensive, for these close fences need not be more than four feet high; because the Vines being to be managed after the same manner as those in vineyards, the branches which carry the fruit will never rise above that height; for the bearing shoots must always be trained about two feet above the surface of the ground, so that the fruit will be always below the top of the close fences; and as for the upright shoots which are designed for the next year's bearing, it matters not how much they rise above the fence; so these may have a loose trellis to which they may be fastened, to prevent their overhanging the fruit.

In the making of these kinds of close espaliers for Grapes, it will be proper to lay one strong oaken plank, (such as are procured in breaking up old ships or barges) next the surface of the ground, which will last many years sound, and be very useful in supporting the fences. If these planks are fifteen inches broad, as they may always be readily procured, and the upper part of the fence be Reeds, there may be two lengths cut out of them (provided the Reeds are of a due length), without including their tops. In the front of these hedges should be a slight trellis to fasten the Vines to, which may be made of Ash-poles. The upright poles of these trellisses need not be nearer together than eighteen inches; and if there are three cross poles, at about a foot asunder, they will be sufficient to fasten the bearing shoots of the Vines at proper distances, in the manner they are designed to be trained, which should be in such positions, that the fruit may not be overshadowed by the branches; and if the upright poles are cut so long, as to be a foot and a half above the Reeds, they will be tall enough to support the upright shoots for the next year's bearing, which, being trained singly at proper distances, will have the advantage of the sun and air to ripen the wood much better than

than where four or five shoots are fastened to the same pole.

To this trellis the Reeds may be fastened with hoops on the back-side, after the manner usually practised in making common Reed-fences; and if on the top of the Reeds there is fastened a thin slip of deal, to secure their tops from being broken, it will preserve them a long time. In making of these fences, the Reeds should not be laid too thick, for that will not only be more expence, but will be troublesome to fasten, and not last so long as when they are made of a moderate thickness: therefore as the Reeds will be cut into two lengths, each bundle will spread about six feet in length, observing first to spread the bottom parts of the bundles, which contain the largest ends of the Reeds the whole length; and then the upper parts of the other Reeds should be reversed, and spread in front of them, which will make the upper part of the fence almost as thick as the bottom. But neither these, nor the boarded fences, need be made till the Vines are in full bearing, which will be the fourth or fifth year after planting, according to the progress they make; during which time the shoots may be supported by any common stakes, for if the fences are made before the Vines are planted, as is frequently practised, they will be half decayed by the time the Vines are fit to bear, and before this time the fences are of no use to them.

The sorts of Grapes which are proper to plant against these fences are,

The Miller Grape.

The Chasselas White.

The White Muscadine.

The Sweet Water, and

Le Cour Grape.

These, if well managed, will ripen very well, provided the season is tolerably good, and will come soon after those of the walls; so that if they are taken care of, by hanging of mats before them, when the nights prove cold in autumn, and are permitted to hang till *October*, the fruit will prove very good. But where the Sweet Water Grape is planted against these fences, they will require to be covered in the spring, at the time when they are in flower, if there should be cold nights, otherwise the bunches will receive a blast, which will destroy the greatest part of the Grapes; so that many times there will not be more than six or eight good Grapes on each bunch, and the others will be small starved fruit, hardly so large as the smallest Peas.

In planting of these Vines, either for open espaliers or the close fences, it should be performed in the same manner as for walls; the cuttings should be planted six feet asunder; and as these are only designed for the table, a single row of Vines of a moderate length will be sufficient to supply a family, where there are others against walls to come before them. But where a person is inclinable to have more rows than one, they should be placed at least twelve feet asunder, that they may equally enjoy the sun and air.

As to the pruning and other management of these Vines, that being the same as for those against walls, I shall not repeat it in this place, it being fully treated of before; and to which I have nothing here to add.

In the folio edition of the *Gardeners Dictionary*, we inserted the several methods of planting and managing vineyards in the principal parts of *Europe*, where the best wines are produced; but as this volume is an abridgment of that work, we have omitted such articles as we supposed might be of least utility to the public; and have frequently shortened others, so as not to render this imperfect: therefore as there may be some purchasers who may be inclined to make trials of vineyards in *England*, so we have here given the best directions we can, for planting and managing them

in this country to the best advantage; which we have extracted from the practice of those persons who reside in countries where there is good wine made, and where the climate approaches nearest to that of *England*; and also from many repeated trials which have been made with success in different parts of this country, from which any diligent person may readily engage in the practice.

The first and great thing to be considered in planting vineyards is the choice of soils and situations, without which there will be little hopes of success, for upon this the whole affair greatly depends. The best soil for a vineyard in *England* is such, whose surface is a light sandy loam, and not above a foot and a half, or two feet, with a gravelly or chalky bottom, either of which are equally good for Vines; but if the soil is deep, upon either clay or a strong loam, it is by no means proper for this purpose; for although the Vines may shoot vigorously, and produce a great quantity of Grapes, yet these will be later ripe, fuller of moisture, and so consequently their juice not mature, nor well digested, but will abound with crudity, which in fermenting will render the wine sour and ill-tasted, which is the common complaint of those who have made wine in *England*.

Nor is a very rich, light, deep soil, such as is commonly found near *London*, proper for this purpose, because the roots of these Vines will be enticed down too deep to receive the influences of sun and air, and hereby will take in much crude nourishment, whereby the fruit will be later ripe, and replete with moisture, which must necessarily contribute greatly to render the juices less perfect, therefore great attention should be had to the nature of the soil upon which they are planted.

The next thing necessary to be considered is the situation of the place, which, if possible, should be on the north-side of a river, upon an elevation inclining to the south, with a small gradual descent, that the moisture may the better drain off; but if the ground slopes too much, it is by no means proper for this purpose; but if at a distance from this place, there are larger hills which defend it from the north and north-west wind, it will be of great service, because hereby the sun's rays will be reflected with a greater force, and the cold winds being kept off, will render the situation very warm. Add to this a chalky surface, which, if those hills do abound with (as there are many such situations in *England*), it will still add to the heat of the place, by reflecting a greater quantity of the sun's rays.

The country about this should be open and hilly, for if it be much planted, or low and boggy, the air will constantly be filled with moist particles, occasioned by the plentiful perspiration of the trees, or the exhalations from the adjoining marshes, whereby the fruit will be greatly prejudiced (as was before observed). These vineyards should always be open to the east, that the morning sun may come on them to dry off the moisture of the night early, which, by lying too long upon the Vines, greatly retards the ripening of their fruit, and renders it crude and ill-tasted. And since the fruit of Vines are rarely injured by easterly winds, there will be no reason to apprehend any danger from such a situation, the south-west, north-west, and north winds being the most injurious to vineyards in *England* (as indeed they are to most other fruit) so that, if possible, they should be sheltered therefrom.

Having made choice of a soil and situation proper for this purpose, the next thing to be done is to prepare it for planting. In doing of which the following method should be observed: In the spring, if the ground is green sward, it should be ploughed as deep as the surface will admit, turning the sward into the bottom of each furrow; then it should be well harrowed to break the clods, and cleanse it from the roots of noxious weeds; and after this, it must be kept

kept constantly ploughed and harrowed for at least one year, to render the surface light; and hereby it will be rendered fertile, by imbibing the nitrous particles of the air (especially if it be long exposed thereto before it is planted); in the next *March* the ground should be well ploughed again, and after having made the surface pretty even, the rows should be marked out from south-east to north-west, at the distance of ten feet from each other; and these rows should be crossed again at five or six feet distance, which will mark out the exact places where each plant should be placed; so that the Vines will be ten feet row from row, and five or six feet asunder in the rows, nearer than which they ought never to be planted. For herein most people, who have planted vineyards, have greatly erred, some having allowed no more than five feet row from row, and the plants but three feet asunder in the rows, and others, who think they have been full liberal in this article, have only planted their Vines at six feet distance every way; but neither of these have allowed a proper distance to them, as I shall shew; for, in the first place, where the rows are placed too close, there will not be room for the sun and air to pass in between them, when the Vines are fully grown, to dry up the moisture, which, being detained amongst the Vines, must produce very ill effects: and, secondly, where the Vines are placed in exact squares so near together as six feet, the effect will be much the same; for the autumns in *England* are often attended with rains, cold dews, or fogs, so proper care should be taken to remove every thing which may obstruct the drying up the damps which arise from the ground.

The skilful *Vignerons* abroad are also sensible how much it contributes to the goodness of their Vines, to allow a large space between the rows; and therefore where the quality of the wine is more regarded than the quantity, they never plant their Vines at less than ten feet row from row, and some allow twelve. It was an observation of *Bellonius*, almost two hundred years since, that in those islands of the *Archipelago*, where the rows of Vines were placed at a great distance, the wine was much preferable to those which were close planted; and this he positively affirms to be the case in most countries where he had travelled. Indeed we need not have recourse to antiquity for the certainty of such facts, when we are daily convinced of this truth in all close plantations of any kind of fruit, where it is constantly observed, that the fruits in such places are never so well coloured, so early ripe, nor near so well flavoured, as those produced on trees, where the air can freely circulate about them, and the rays of the sun have free access to the branches, whereby the juices are better prepared before they enter the fruit.

Having thus considered the distance which is necessary to be allowed to these plants, we come next to the planting; but in order to this, the proper sorts of Grapes should be judiciously chosen, and in this particular we have egregiously erred in *England*. Most of the vineyards at present planted here, are of the sweetest and best sort of Grapes for eating, which is contrary to the general practice of the *Vignerons* abroad, who always observe, that such Grapes never make good wine; and therefore from experience, make choice of those sorts of Grapes, whose juice, after fermenting, affords a noble rich liquor; these Grapes are always austere, and not so palatable. This is also agreeable to the constant practice of our cyder-makers in *England*, who observe, that the best eating Apples seldom make good cyder; whereas the more rough and austere sorts, after being pressed and fermented, afford a strong vinous liquor. And I believe it will be found true in all fruits, that where the natural heat of the sun ripens and prepares their juices, so as to render them palatable, whatever degree of heat these juices have more, either by fermentation, or from any other cause, will ren-

der them weaker and less spirituous. Of this we have many instances in fruits; for if we transplant any of our summer or autumn fruits, which ripen perfectly in *England* without the assistance of art, into a climate a few degrees warmer, these fruits will be mealy and insipid; so likewise if we bake or stew any of these fruits, they will be good for little, losing all their spirit and flavour by the additional heat of the fire; and such fruits as are by no means eatable raw, are hereby rendered exquisite, which, if transplanted into a warmer climate, have, by the additional heat of the sun, been also altered so as to exceed the most delicious of our fruits in this country.

From whence it is plain, that those Grapes which are agreeable to the palate for eating, are not proper for wine; in making of which, their juices must undergo a strong fermentation; therefore since we have in *England* been only propagating the most palatable Grapes for eating, and neglected the other sorts, before we plant vineyards, we should take care to be provided with the proper sorts from abroad, which should be chosen according to the sort of wines intended to be imitated; though I believe the most probable sort to succeed in *England* is the *Auvernat*, or true *Burgundy* Grape, (which is rarely found in the *English* vineyards, though it is a common Grape in the gardens against walls). This sort of Grape is most preferred in *Burgundy*, *Champaign*, *Orleans*, and most of the other wine countries in *France*; and I am informed, that it succeeds very well in several places to the north of *Paris*, where proper care is taken of their management; so that I should advise such persons as would try the success of vineyards in *England*, to procure cuttings of this Grape; but herein some person of integrity and judgment should be employed to get them from such vineyards where no other sorts of Grapes are cultivated, which is very rare to find, unless in some particular vineyards of those persons who are very exact to keep up the reputation of their wines, nothing being more common than for the *Vignerons* to plant three or four sorts of Grapes in the same vineyard, and at the time of vintage to mix them all together; which renders their wines less delicate, than in such places where they have only this one true sort of Grape. And here I would caution every one against mixing the juice of several Grapes together, which will cause the wine to ferment at different times, and in different manners.

The cuttings being thus provided (for I would always prefer these to layers, or rooted plants, for the reasons given at the beginning of this article) about the beginning of *April* is the best season for planting, when it will be proper to put the lower ends of the cuttings in water about three inches, setting them upright for six or eight hours before they are used; then at the center of every cross mark already made by a line, to the distance the Vines are designed, should be a hole made with a spade, or other instrument, about a foot deep; into each of which should be put one strong cutting, placing it a little sloping; then the hole should be filled up with earth, pressing it gently with the feet to the cutting, and raising a little hill to each about three inches, so as just to cover the uppermost eye or bud, which will prevent the wind and sun from drying any part of the cuttings, and this upper eye only will shoot; the under ones, most of them, will push out roots, so that this shoot will generally be very strong and vigorous.

After they are thus planted, they will require no other care until they shoot, except to keep the ground clear from weeds, which should be constantly observed; but as the distance between the rows of Vines is very great, so the ground between them may be sown or planted with any kind of esculent plants, which do not grow tall, provided there is proper distance left from the Vines, and care taken that

the Vines are not injured by the crops, or in the gathering, and carrying them off the ground; and this husbandry may be continued two or three years, till the Vines come to bearing; after which time there should be no sort of crop put between them in summer, because the cleaner the ground is kept between the Vines from weeds or other plants, the more heat will be reflected to the Grapes; but after the Grapes are gathered, there may be a crop of Coleworts for spring use planted between the rows of Vines, and the cultivating of these will be of use to the Vines, by stirring of the ground; but as to watering, or any other trouble, there will be no occasion for it, notwithstanding what some people have directed, for in *England* there is no danger of their miscarrying by drought. When the cuttings begin to shoot, there should be a stick of about three or four feet long stuck down by each, to which the shoot should be fastened, to prevent their breaking or lying on the ground; so that as the shoots advance, the fastening should be renewed, and all small lateral shoots (if there are any such produced) should be constantly displaced, and the ground between the Vines always kept clean. This is the whole management which is required the first summer.

But at *Michaelmas*, when the Vines have done shooting, they should be pruned; for if they are left unpruned till spring, their shoots being tender (especially toward their upper parts) will be in danger of suffering if the winter should prove severe.

This pruning is only to cut down the shoots to two or three eyes; and if, after this is done, the earth be drawn up in a hill about each plant, it will still be a greater defence against frost.

At the beginning of *March* the ground between the Vines should be well dug to loosen it, and render it clean; but you should be careful not to dig deep close to the Vines, lest thereby their roots should be cut or bruised; and at the same time the earth should be again laid up in a hill about each plant; but there must be care taken not to bury the young eyes of the former year's shoot, which were left to produce new wood.

At the beginning of *May*, when the Vines are shooting, there should be two stakes fixed down to the side of each plant, which must be somewhat taller and stronger than those of the former year; to these the two shoots (if so many are produced) should be fastened, and all the small trailing or lateral shoots should be constantly displaced, to strengthen the shoots; the ground should also be kept very clear from weeds as before.

The autumn following these Vines should be pruned again in the following manner; those of them which have produced two strong shoots of equal vigour, must be cut down to three eyes each; but in such as have one strong shoot and a weak one, the strong one must be shortened to three eyes, and the weak one to two; and such Vines as have produced but one strong shoot, should be shortened down to two eyes also, in order to obtain more wood against the succeeding year.

In the spring, about the middle of *March*, the ground between the Vines should be again dug, as before, and two stakes should be placed down by the side of all such Vines as have two shoots, at such distance on each side of the plant as the shoots will admit to be fastened thereto, and the shoots should be drawn out on each side to the stakes, so as to make an angle of about forty-five degrees with the stem; but by no means should they be bent down horizontally, as is by some practised, for the branches lying too near the earth, are generally injured by the damps which arise from thence, but especially when they have fruit, which is never so well tasted, nor so early ripe upon those branches, as when they are a little more elevated.

In *May*, when the Vines begin to shoot, they must be carefully looked over, and all the weak dangling shoots should be rubbed off as they are produced; and those shoots which are produced from strong eyes, should be fastened to the stakes to prevent their being broken off by the wind.

This management should be repeated at least every three weeks, from the beginning of *May* to the end of *July*; by which means the shoots which are trained up for the succeeding year, will not only be stronger, but also better ripened and prepared for bearing, because they will have the advantage of sun and air, which is absolutely necessary to prepare their juices; whereas, if they are crowded by a number of small dangling weak branches, they will shade and exclude the rays of the sun from the other shoots, and so by detaining the moisture a longer time amongst the branches, occasion the vessels of the young wood to be of a larger dimension; and hereby the crude juice finds an easy passage through them, so that the shoots in autumn seem to be mostly pith, and are of a greenish immature nature; and wherever this is observed, it is a sure sign of a bad quality in the Vines.

The soil also should be constantly kept clean, because, if there are any vegetables (either weeds or plants of other kinds) growing between the Vines, it will detain the dews longer, and by their perspiration occasion a greater moisture than would be, if the ground were entirely clear; so that those who plant other things between their rows of Vines, are guilty of a great error.

In autumn the Vines should be pruned, which season I approve of rather than the spring (for reasons before given) and this being the third year from planting, the Vines will now be strong enough to produce fruit, therefore they must be pruned accordingly. Now suppose the two shoots of the former year, which were shortened to three eyes, have each of them produced two strong branches the summer past, then the uppermost of these shoots upon each branch should be shortened down to three good eyes (never including the lower eye, which is situate just above the former year's wood, which seldom produces any thing, except a weak dangling shoot); and the lower shoots should be shortened down to two good eyes each; these being designed to produce vigorous shoots for the succeeding year, and the former are designed to bear fruit; but where the Vines are weak, and have not produced more than two or three shoots the last season, there should be but one of them left with three eyes for bearing; the other must be shortened down to two, or if weak to one good eye, in order to obtain strong shoots the following summer; for there is nothing more injurious to Vines than the leaving too much wood upon them, especially while they are young; or the overbearing them, which will weaken them so much, as not to be recovered again to a good state in several years, though they should be managed with all possible skill.

In *March* the ground between the Vines should be well dug as before, observing not to injure their roots by digging too deep near them; but where there are small horizontal roots produced on or near the surface of the ground, they should be pruned off close to the places where they were produced; these being what the *Vignerons* call day-roots, and are by no means necessary to be left on: after having dug the ground, the stakes should be placed down in the following manner: On each side of the Vine should be a stake put in at about sixteen inches from the root, to which the two branches, which were pruned to three eyes, each for bearing, should be fastened, (observing, as was before directed, not to draw them down too horizontally); then another taller stake should be placed down near the foot of the Vine, to which the two shoots which were pruned down to two eyes, should be fastened, provided they are long enough

enough for that purpose; but if not, when their eyes begin to shoot, these must be trained upright to the stakes, to prevent their trailing on the ground, hanging over the fruit-branches, or being broke by the wind.

In *May* the Vines should be carefully looked over again, at which time all weak lateral branches should be rubbed off as they are produced; and those shoots which show fruit must be fastened with bafs to the stakes, to prevent their being broken, until they are extended to three joints beyond the fruit, when they should be stopped; but the shoots which are designed for bearing the following season should be trained upright to the middle stake, by which method the fruit-branches will not shade these middle shoots, nor will the middle shoots shade the fruit, so that each will enjoy the benefit of the sun and air.

This method should be repeated every three weeks, from the beginning of *May* to the middle of *July*, which will always keep the shoots in their right position, whereby the leaves will not be inverted, which greatly retards the growth of the fruit; and by keeping the Vines constantly clear from horizontal shoots, the fruit will not be crowded with leaves and shaded, but will have constantly the advantage of the sun and air equally, which is of great consequence; for where the fruit is covered with these dangling shoots in the spring, and are afterwards exposed to the air, either by divesting them of their leaves, or else displacing their branches entirely, as is often practised, the fruit will become hard, and remain at a perfect stand for three weeks, and sometimes will never advance afterward, as I have several times observed; therefore there cannot be too much care taken to keep them constantly in a kindly state of growth, as the *Vignerons* abroad well know, though in *England* it is little regarded by the generality of gardeners, who, when their Grapes suffer by this neglect, immediately complain of the climate, or the untowardness of the season, which is too often a cover for neglects of this nature. And here I cannot help taking notice of the absurd practice of those, who pull off their leaves from their Vines, which are placed near the fruit, in order to let in the rays of the sun to ripen them, not considering how much they expose their fruit to the cold dews, which fall plentifully in autumn, which, being imbibed by the fruit, greatly retard them; besides, no fruit will ripen so well when entirely exposed to the sun, as when they are gently screened with leaves, which are absolutely necessary to prepare the juices before they enter the fruit, the gross parts of which are perspired away by the leaves, the fruit must either be deprived of nourishment, or else some of the gross particles will enter with the more refined parts of the juice, and thereby render the fruit worse than it would otherwise be, were the leaves permitted to remain upon the branches; for if the weak dangling shoots are constantly displaced as they are produced, the fruit will not be too much shaded by the leaves that are upon the bearing branches.

When the fruit is ripe, if the stalks of the bunches are cut half through a fortnight before they are gathered, it will cause the juice to be much better, because there will not be near so great a quantity of nourishment enter the fruit, whereby the watery particles will have time to evaporate, and the juice will be better digested. This is practised by some of the most curious *Vignerons* in the south of *France*, where they make excellent wine. But if after the fruit be cut, it is hung up in a dry room upon strings, so as not to touch each other, for a month before they are pressed, it will also add greatly to the strength of the wine, because in that time a great quantity of the watery parts of the juices will evaporate. This is a constant practice with some persons who inhabit the *Tirolese*, on the borders of *Italy*, where is made a most delicious rich wine, as hath been attested by

Dr. Burnet in his travels; and I have heard the same from several gentlemen who have travelled that road since.

But with all the care that can possibly be taken, either in the culture of the Vines, or in making the wine, it will not be near so good while the vineyard is young, as it will be after it has been planted ten or twelve years; and it will be constantly mending, until it is fifty years old, as is attested by several curious persons abroad, as also by the most skilful wine-coopers at home, who can tell the produce of a young vineyard from that of an old one, after it is brought to *England*, by the colour of the wine. This difference is very easily accounted for, from the different structure of the vessels of the plants; those of the young Vines being larger, and of a looser texture, easily admit a larger quantity of gross nourishment to pass through them; whereas those of old Vines, which are more woody, are more closely constricted, and thereby the juice is better strained in passing through them, which must consequently render it much better, though the Grapes from a young vineyard will be larger, and afford a greater quantity of juice, so that people should not be discouraged if their Vines at first are not so good as they would wish; since afterward, when the vineyard is a few years older, the wine may answer their expectation. As to the fermenting and managing the wine, that is treated of particularly under the article *WINEs*, to which the reader is desired to turn.

The vineyard being now arrived to a bearing state, should be treated after the following manner: First, in the pruning there should never be too many branches left upon a root, nor those too long, for although by doing of this there may be a greater quantity of fruit produced, yet the juice of these will never be so good as when there is a moderate quantity which will be better nourished, and the roots of the plants not so much weakened; which is found to be of so bad consequence to vineyards, that when gentlemen abroad let out vineyards to *Vignerons*, there is always a clause inserted in their leases, to direct how many shoots shall be left upon each Vine, and the number of eyes to which the branches must be shortened; because were not the *Vignerons* thus tied down, they would overbear the Vines, so that in a few years they would exhaust their roots, and render them so weak as not to be recovered again in several years; and their wine would be so bad, as to bring a disreputation on the vineyard, to the great loss of the proprietor.

The number of branches which the *Italians* generally agree to leave upon a strong Vine are four; two of the strongest have four eyes, and the two weaker are shortened down to two eyes each; which is very different from the common practice in *England*, where it is usual to see six or eight branches left upon each root, and those perhaps left with six or eight eyes to each; so that if these are fruitful, one root must produce near four times the number of bunches which the *Italians* do ever permit, and so consequently the fruit will not be so well nourished, and the roots will also be greatly weakened; as is the case of all sorts of fruit trees, when a greater number of fruit is left on than the trees can nourish.

The next thing is, constantly to keep the ground perfectly clean between the Vines, never permitting any sort of plants or weeds to grow there. The ground should also be carefully dug every spring, and every third year have some manure, which should be of different sorts, according to the nature of the ground, or which can be most conveniently procured.

If the land is stiff, and inclinable to bind on the surface, then sea sand, or sea coal ashes, are either of them very good manure for it; but if the ground be loose and dry, then a little lime mixed with dung is the best manure for

it. This must be spread thin upon the surface of the ground before it is dug, and in digging should be buried equally in every part of the vineyard. These are much preferable to that of all dung for Vines, so that it will be worth the expence to procure either of them; and as they require manuring but every third year, where the vineyard is large it may be divided into three equal parts, each of which may be manured in its turn, whereby the expence will be but little every year; when the whole is manured together it will add to the expence, and in many places there cannot be a sufficient quantity procured to manure a large vineyard in one year.

This digging and manuring should always be performed about the middle of *March*, at which time all the superficial or day-roots, as they are called, must be cut off, but the larger roots must not be injured by the spade, &c. therefore the ground close to the stem of the Vines must not be dug very deep. After this is done, the stakes should be placed down, one on each side the Vines, at about sixteen inches from their stems, to which the longest bearing branches should be fastened, and one stake close to the stem, to which the two shorter branches should be trained upright, to furnish wood for the succeeding year.

In the summer they must be carefully looked over, as before, rubbing off all weak dangling shoots, and training the good ones to the stakes regularly as they are produced, and those of them which have fruit should be stopped in *June*, about three joints beyond the bunches, but the upright shoots, which are designed for bearing the following year, must not be stopped till the middle of *July*, when they may be left about five feet long; for if they are stopped sooner in the year, it will cause them to shoot out many dangling branches from the sides of the eyes, which will not only occasion more trouble to displace them, but also will be injurious to the eyes or buds.

N. B. All this summer dressing should be performed with the thumb and finger, and not with knives, because the wounds made by instruments in summer do not heal so soon as when stopped by gently nipping the leading bud, which, if done before the shoot is become woody, may be effected with great ease, being very tender while young.

When a vineyard is thus carefully dressed, it will afford as much pleasure in viewing it as any plantation of trees and shrubs whatever, the rows being regular; and if the stakes are exactly placed, and the upright shoots stopped to an equal height, there is nothing in nature which will make a more beautiful appearance; and during the season that the Vines are in flower they emit a most grateful scent, especially in the morning and evening; and when the Grapes begin to ripen, there will be fresh pleasure arising in the viewing of them.

But as the beauty of vineyards arises from the regular disposition of the branches of the Vines, great care should be taken in their management to train them regularly, and to provide every year for new wood to bear the succeeding year; because the wood which has produced fruit is commonly cut quite away after the fruit is gathered, or at least is shortened down to two eyes, to force out shoots for the next year; where there is not a sufficient number of branches upon the Vine of those trained upright, so that in summer, when the Vines are in perfection, there should be six upright shoots trained for the next year's wood, and three or four bearing branches with fruit on them; more than these ought never to be left upon one Vine, for the reasons before given.

N. B. The *Auvernat*, or true *Burgundy* Grape, is valued in *France* before any other sort, because the fruit never grows very close upon the bunches, therefore are more equally ripened; for which reason it should also be pre-

ferred in *England*; though in general those sorts are most esteemed with us that have always close bunches, which is certainly wrong; for it may be observed, that the Grapes on such bunches are commonly ripe on one side and green on the other, which is a bad quality for such as are pressed to make wine.

I shall now subjoin a few sorts of Vines, which are preserved in some curious gardens, more for the sake of variety than the value of their fruit: these are,

1. *VITIS foliis cordatis dentatis subtus villosis, cirrbis racemiferis. Flor. Zeyl. 99.* Wild Indian Vine, with round berries.

2. *VITIS foliis cordatis subtrilobis dentatis subtus tomentosis. Lin. Sp. Plant. 203.* Wild Virginia Grape.

3. *VITIS foliis cordatis dentato-ferratis utrinque nudis. Lin. Sp. Plant. 203.* The Virginia Fox-grape.

4. *VITIS foliis quinatis, foliolis multifidis. Hort. Cliff. 74.* Vine with jagged leaves, commonly called the Parsley-leaved Grape.

5. *VITIS foliis supradecompositis, foliis lateralibus pinnatis. Lin. Sp. Plant. 203.* Climbing Virginia shrub with Parsley leaves, sending out tendrils. This is the *Reynardsonia*. *Rand. Ind. Hort. Chelf.* Falsly called the Pepper-tree.

The first sort grows naturally in both *Indies*. The stalks of this are woody, and send out many slender branches, which are furnished with tendrils, by which they fasten themselves to the neighbouring trees, and are thereby supported. The leaves are heart-shaped, indented on their edges, and hairy on their under side. The flowers are disposed in bunches, like those of the other species, and are succeeded by round berries or Grapes, of an austere taste.

The second sort hath ligneous stalks which send out many branches, that fasten themselves by tendrils to any neighbouring support. The leaves of this are large, and for the most part divided into three lobes which are indented on their edges. The under side of the leaves is covered with a white down. The fruit is disposed in bunches like the other Grapes. The berries are round and black; the juice has a rough flavour.

The third sort has heart-shaped leaves, which are indented on their edges, and are smooth on both sides. The plants climb on trees by the help of their tendrils, like those of the other sorts. The fruit is disposed in bunches. The berries are black, and their juice has a flavour resembling the scent of a fox, from whence the inhabitants have given it the title of Fox-grape.

The fourth sort is supposed to grow naturally in *Canada*, but it has been long cultivated in the *European* gardens for its fruit; but as it has little flavour, and ripens late in autumn, so it has been almost banished the *English* gardens, where at present there are only a few plants preserved for the sake of variety. The stalks and branches of this are like those of the common Grape, but the leaves are cut into many slender segments. The Grapes are round and white, and are disposed in loose bunches.

The fifth sort is by *Dr. Linnæus* ranged under this genus of *Vitis*, but the characters of this plant are not sufficiently known in *Europe*, to determine the proper genus to which it belongs, for the plant seldom produces flowers here, and has never produced any fruit in *England*, for which reason I have ranged it under the same genus, upon *Dr. Linnæus's* authority.

The stalk of this plant is ligneous, and sends out many slender branches furnished with tendrils, which fasten themselves to any neighbouring plants for support, and are garnished with leaves composed of many smaller winged leaves, so that they are divided somewhat like those of common Parsley; they are of a lucid green on their upper side, but are much paler on their under. The flowers spring from
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the wings of the stalks in loose bunches; they are very small, white, and are composed of five small petals, which expand and soon fall off; these are not succeeded by any fruit in *England*, but the berries which I have received from *America* had generally three seeds in each.

The first sort being a native of warm countries, will not live in *England* without artificial heat; it is easily propagated by seeds, when they are brought from the countries where the plants grow naturally, for they do not produce any here; these must be sown in small pots, which should be plunged into a hot-bed of tanners bark. When the plants come up and are fit to remove, they should be each transplanted into a separate small pot filled with light earth, and plunged into a fresh hot-bed of tanners bark, shading them from the sun till they have taken new root; then they must be treated in the same way as other tender exotick plants from the same countries, always continuing them in the stove, otherwise they will not thrive. These plants cast off their leaves every winter.

The second and third sorts grow in great plenty in the woods of *America*, where, I have been informed, are many other sorts, which produce fruit very little inferior to some of the fine sorts which are cultivated in *Europe*; notwithstanding which, it is generally thought impossible to make wine in *America*; but this, I dare say, must proceed from a want of skill, rather than any bad quality in the soil or climate; so that instead of planting vineyards on their loose rich lands (as hath been generally practised by the inhabitants of those countries), if they would plant them upon rising ground, where the bottom was rocky or hard near the surface, I dare say they would have very good success; for the great fault complained of in those countries is, that the Grapes generally burst before they are fully ripe, which must certainly be occasioned by their having too much nourishment; therefore, when they are planted on a poorer soil, this will be in part remedied. Another cause of this may proceed from the moisture of the air (occasioned by the perspiration of trees, &c.) which being imbibed by the fruit, may break their skins. This cannot indeed be prevented, until the country is better cleared of the timber; but, however, this should caution people not to plant Vines in such places where there are great quantities of woods, because of this effect which it hath on the Grapes. But to return:

These two Vines are preserved in the gardens of those who are curious in botany, but I have not seen either of them produce fruit in this country. They may be propagated by layers in the same manner as the common Grapes, which will take root in one year, and may be taken off, and transplanted where they are to remain, which should be against a warm wall; because if they are exposed to much cold in winter, they are often destroyed, especially while they are young.

The pruning and management is the same with any other sorts of Grapes, but only they should have fewer shoots, and those shortened down very low, otherwise they will make very weak shoots the following year, and never arrive to any considerable strength, so will not be capable of producing any fruit.

The fourth sort is planted against walls, and treated in the same way as the common Vines, and may be propagated by cuttings or layers in like manner.

The fifth sort is preserved in some gardens for the sake of variety, but as it rarely produces flowers in *England*, so it has not much beauty; it is a native in *Virginia* and *Carolina*. From both of these countries I have received the seeds. As this sort does not produce seeds here, it is generally propagated by laying down the young branches, which will put out roots in one year fit to remove, when

they may be taken off, and transplanted where they are to remain. These require support; and as their young branches are tender and liable to be killed by frost, so if they are planted against a wall or pale, exposed to the south, they will succeed much better than when they are fully exposed to the open air, and supported by props. The young shoots of these plants should be shortened down to two or three buds in the spring, which will cause the shoots of the following summer to be much stronger, and when they are regularly trained against the wall or pale, they will produce flowers in warm seasons.

This plant is very apt to push out suckers from the root, by which it is often propagated, but the plants so raised are very subject to send out suckers again, whereby they are robbed of their nourishment, and do not thrive so well as those which come from layers.

VITIS IDÆA. See Vaccinium.

VITIS SYLVESTRIS. See Clematis.

ULEX. *Lin. Gen. Plant.* 786. Furze, Gorse, or Whins.

The Characters are,

The flower has a two-leaved empolement; it has five petals, and is of the butterfly kind. The standard is large, erect, oval, heart-shaped, and indented at the point. The wings are shorter and obtuse. The keel is composed of two obtuse petals, whose borders are joined at bottom; it has ten stamina, nine joined, and one separate, terminated by single summits, with an oblong cylindrical germen, supporting a rising style, crowned by a small obtuse stigma. The germen afterward turn to an oblong turgid pod with one cell, opening with two valves, inclosing a row of kidney-shaped seeds.

The Species are,

1. ULEX foliis villosis acutis spinis sparsis. *Lin. Sp. Plant.* 741. Ulex with acute-pointed hairy leaves, and sparsed spinous. The common Furze, Whins, or Gorse.

2. ULEX foliis obtusis solitariis, spinis simplicibus terminalibus. *Flor. Leyd. Prod.* 372. African Furze, or Whins, with single blunt leaves ending with spinous.

The common Furze, Gorze, or Whins; as it is called in the different counties in *England*, is so well known as to need no description.

There are two or three varieties of this, which are frequently met with on the commons and heaths, in most parts of *England*; but as they are not specifically different they are not worth enumerating here, especially as they are plants which are seldom cultivated.

These plants propagate themselves very plentifully by seeds, so that when they are established in a spot of ground they soon spread over the place; for as the seeds ripen, the pods open with the warmth of the sun, and the seeds are cast out with an elasticity to a great distance all round, and these soon vegetate; whereby the ground is filled with young plants, which are not easily destroyed when they are well rooted in the ground.

Some years ago the seeds of this plant were sown to form hedges about fields, where, if the soil was light, the plants soon became strong enough for a fence against cattle; but as these hedges in a few years became naked at the bottom, and some of the plants frequently failed, there became gaps in the hedges, therefore the raising of them for that purpose has been of late years little practised. But there are some persons who have sown the seeds of this plant upon very poor, hungry, gravel or sandy land, which has produced more profit than they could make of the ground by any other crop, especially in such places where fuel of all sorts is dear; for this Furze is frequently used for heating ovens, burning lime and bricks, and also for drying malt. And in some places where there has been a scarcity of fuel, I have known poor land, which would have let for two shillings per acre, which has been sown with Furze, produce one

found *per acre per ann.* so that there has been a considerable improvement made by this plant. But this is not worth practising in such countries where fuel of any kind is cheap, or upon such land as will produce good Grass or Corn; therefore it is only mentioned here to shew, that poor lands may be so managed, as to bring an annual profit to their proprietors.

The second sort is a native of the country near the *Cape of Good Hope*, where it usually grows to the height of five or six feet; but in *Europe*, where it is preserved as a curiosity in some gardens, it seldom rises so high. The stalk is ligneous and hard, covered with a greenish bark when young, but it afterwards becomes greyish. The branches are slender and ligneous, the leaves are single, obtuse, and the shoots terminate with spines. This has been several years in the *English* gardens, but has not produced any flowers.

This plant is too tender to live in the open air, through the winter in *England*, therefore it is preserved in green-houses, with the hardier sorts of exotick plants, which do not require any artificial heat to preserve them.

It is very difficult to propagate either by layers or cuttings, for the layers are generally two or three years before they have sufficient root to transplant, and the cuttings do very rarely take root; and as the plant does not produce seeds in *Europe*, it is very rare in the *European* gardens. It is a plant of no great beauty, but, as it is an ever-green, it is admitted into the gardens of those who are curious in botany for the sake of variety.

ULMARIA. See Spiræa.

ULMUS. *Tourn. Inst. R. II. 601. tab. 372.* The Elm-tree.

The Characters are,

The flower has a rough permanent empalement of one leaf, cut into five points, and coloured within; it has no petals, but has five awl-shaped stamina, twice the length of the empalement, terminated by short erect summits having four furrows, and an orbicular erect germen supporting two styles which are reflexed, and crowned by hairy stigmas. The germen afterward turns to a roundish, compressed, bordered capsule, including one roundish compressed seed.

The Species are,

1. ULMUS foliis oblongis acuminatis, duplicato serratis, basi inæqualibus. Elm with oblong acute-pointed leaves, which are doubly sawed on their edges, and unequal at their base; the common rough, or broad-leaved Witch Elm.

2. ULMUS foliis oblongo-ovatis inæqualiter serratis, calycibus foliaceis. Elm with oblong oval leaves which are unequally sawed, and have leafy empalements to the flowers; the Witch Hazel, or very broad leaved Elm; by some unskillful persons called the *British* Elm.

3. ULMUS foliis ovatis acuminatis duplicato-serratis, basi inæqualibus. Elm with oval acute-pointed leaves which are doubly sawed, and unequal at their base; the small-leaved or *English* Elm.

4. ULMUS foliis ovatis glabris, acutè serratis. Elm with oval smooth leaves, which are sharply sawed on their edges; the smooth-leaved Witch Elm.

5. ULMUS foliis ovatis acuminatis rugosis, inæqualiter serratis, cortice fungoso. Elm with oval, acute pointed, rough leaves, which are unequally sawed, and a fungous bark; the *Dutch* Elm.

6. ULMUS foliis oblongo-ovatis glabris acuminatis duplicato-serratis. Elm with oblong, smooth, acute pointed leaves, which are doubly sawed; the smooth narrow-leaved Elm; by some called the upright Elm.

The first sort is very common in the north-west counties of *England*, where it is generally believed to grow naturally in the woods; this grows to a very large size. The bark

of the young branches is smooth and very tough, but that of the old trees cracks and is rough. The branches spread, and do not grow so erect as those of the third sort. The leaves are rough, and are doubly sawed on their edges. Their base is unequal, standing on short foot stalks. The flowers come out in *March* upon the slender twigs in clusters, of a deep red colour, and are succeeded by oval bordered capsules, containing one roundish compressed seed, which ripens in *May*. The wood of this tree is very good for all the purposes of any kind of Elm, and the trees grow to a very large size, but the leaves do not come out till late in the spring, so there are few persons who plant these trees for ornament.

The second sort grows naturally in some of the northern counties of *England*, where it is frequently called *Witch Hazel*, from the resemblance of the young shoots and leaves to those of *Hazel*. This grows to a tree of great magnitude. The bark of the young shoots is very smooth and tough; it is of a yellowish brown colour, with spots of white. The leaves are oval, unequally sawed on their edges. The flowers grow in clusters toward the end of the twigs; they have long leafy empalements of a green colour, appearing in the spring before their leaves, and the seeds ripen the latter end of *May*. The wood of this tree is not so good for use as that of the first sort. Formerly, when long bows were in use, many of them were made of the boughs of this tree.

The third sort is commonly known in the nursery-gardens by the title of *English Elm*, which is far from being a right appellation; for it is not a native of *England*, and is only found in plantations where the young trees were procured from the neighbourhood of *London*. Where this tree grows naturally is not easy to determine; some persons have supposed it was brought from *Germany*. As this tree is well known it requires no description. The flowers of this are of a purplish red colour, and generally appear the beginning of *March*, but I could never observe any seeds upon this sort.

The fourth sort is very common in several parts of *Hertfordshire*, *Essex*, and other north-east counties of *England*; this grows to a large tree, and is much esteemed. The branches spread out like those of the first sort. The leaves are sharply sawed on their edges; they are smoother than most of the other sorts, and do not appear till the middle or latter end of *May*, so the trees are seldom planted for ornament.

The fifth sort is well known by the title of *Dutch Elm*; this was brought from *Holland* the beginning of king *William's* reign, and was for some time a fashionable tree, and has been recommended for its quick growth; it was some years ago in request for forming hedges in gardens, for which purpose it was one of the most improper trees that could be chosen; for they made very strong irregular shoots, which are distant from each other. The leaves were very large and rough, and the branches covered with a fungous rough bark, which was disagreeable, so that when the hedges were sheared, they appeared naked and disagreeable the whole summer after. The wood of this tree is good for nothing, so it is almost banished this country.

The sixth sort is found growing in hedge-rows in several parts of *England*. The branches of this sort have a smooth grayish bark, and grow erect. The leaves are narrower, and more pointed than those of the *English* Elm, and are smoother; they are later in coming out in the spring than those, but continue longer in autumn; this has been by some called the *Lisb* Elm.

There are some other varieties of this tree which are preserved in the nursery-gardens, but their difference is not remarkable

markable enough to deserve notice; therefore they are omitted, as are also those with variegated leaves, of which there are several varieties propagated in the nurseries about London; these are by some persons esteemed.

All the sorts of Elm may be either propagated by layers or suckers taken from the roots of the old trees, the latter of which is generally practised by the nursery-gardeners; but as these are often cut up with indifferent roots they often miscarry, and render the success doubtful; whereas those which are propagated by layers are in no hazard, and always make better roots, and come on faster than the other, and do not send out suckers from their roots in such plenty, for which reason this method should be more universally practised. And since a small compass of ground filled with stools of these plants will be sufficient to furnish a nursery of a considerable extent, annually, with layers to be transplanted, it is richly worth every person's while, who would cultivate these trees, to allot a spot of ground for this purpose.

The best soil for such a nursery is a fresh Hazel loam, neither too light and dry, nor over moist and heavy; this ground should be well trenched, and if a little rotten dung is buried therein it will be of service; in doing of this great care should be taken to pick out all roots of pernicious weeds, which, if left in the ground, would be very injurious to the layers, and cannot afterwards be so easily rooted out; then having laid the ground level, the plants must be planted at about eight feet asunder each way. The best season for this work is in autumn, as soon as the leaves begin to decay, that they may take root before the dry weather in the spring comes on, whereby a great expence of watering them will be saved; for if they are well settled in the ground before the dry weather, they will require little more than to mulch their roots to keep the earth from drying.

These plants should be permitted to grow rude two years, during which time the ground between should be carefully cleaned and dug every spring, by which time they will be well rooted, and have made pretty strong shoots, so that they may be laid in the ground. The manner of performing this being already described in the article *LAYERS*, I shall forbear repeating it in this place.

When these layers are well rooted, which will be in one year, they should be taken off, and transplanted out into a nursery, which should be upon a good soil, and well prepared (as before for the stools). The plants should be planted in rows four feet asunder, and two feet distance plant from plant in rows. This should be done in autumn, as soon as the leaves begin to decay, and if there is some mulch laid upon the surface of the ground about their roots, it will preserve them from being hurt by frost in winter, and from drying winds in spring, and thereby secure them from all hazard.

In this nursery they may remain four or five years, observing constantly to dig the ground between them every spring, and to trim them up to stems, which will promote their growth, and render them strong enough to transplant out where they are to remain in the time before-mentioned.

These trees are very proper to plant in hedge rows, upon the borders of fields, where they will thrive much better than when planted in a wood or close plantation, and their shade will not be very injurious to whatever grows under them; but when these trees are transplanted out upon banks after this manner, the banks should be well wrought and cleared from all other roots, otherwise the plants, being taken from a better soil, will not make much progress in these places. About *Michaelmas* will be a good time for this work for the reasons before assigned, but when

they are planted there should be some stakes fixed in by them, to which they should be fastened to prevent their being displaced by the winds, and part of their heads should be taken off before they are planted, which will also be of use in preventing their being easily overturned by winds, but by no means should their leading shoot be stopped, nor the branches too closely cut off; for if there are not some shoots left on to draw and attract the sap, they will be in danger of miscarrying.

These trees are also proper to plant at a distance from a garden or building, to break the violence of winds; for which purpose there is not any tree more useful, for they may be trained up in form of a hedge, keeping them cut every year, which will cause them to grow very close and handsome, to the height of forty or fifty feet, and be a great protection against the fury of winds; but they should not be planted too near a garden, where fruit trees, or other plants are placed, because the roots of the Elms run superficially near the surface of the ground to a great distance, and will intermix with the roots of the other trees, and deprive them of nourishment; nor should they be planted near gravel or Grass-walks, which are designed to be well kept, because the roots will run into them, and send forth suckers in great plenty, which will deface the walks, and render them unsightly.

But for large gardens, where shade is required, there is scarce any tree so proper for that purpose, being easy to remove when grown to a considerable size; so that a person who is willing to have his plantations for shade in a short time, may procure trees of near one foot circumference in their trunk, which will be in little danger of succeeding, provided they are removed with care. And these will take root and grow very well, though not so well as young plants, which is what few other sorts of trees will do; but then they should be such trees as have been thus regularly trained up in a nursery, and have good roots, and not such as are taken out of hedge-rows (as is by some practised), which seldom rise with any tolerable roots, and consequently often miscarry; and this has been the occasion of so many plantations of these trees failing; for though some of them may live a few years, yet few of them are of long duration, and they rarely increase much in their stems, but frequently grow hollow, their heart decaying first, so that they are supported only by their bark or shell for a few years, and the first severe winter, or very dry summer, they are generally destroyed.

But although I have said, that Elms which are trained up in a nursery may be removed with safety, at a larger size than most other trees, yet I would not have it understood, that by this I would recommend the planting of them when large; for if people would have a little patience when they plant, and never plant any of these trees which are more than five or six inches in girth of their stems, they will in a few years become better trees than any of those which are transplanted of a much larger growth, and will grow to a much larger size; besides, they are much more easily removed, and do not require to be so strongly supported, nor is there much danger of the young trees miscarrying; therefore it is much more eligible to make choice of young thriving trees (but not out of a better soil than that where they are to be planted), and never to plant any large trees, unless where a small number may be wanted for an immediate shade; and in such cases it is always proper to plant some young trees amongst the large ones, to succeed them when they fail.

In planting of these trees great care should be taken not to bury their roots too deep, which is very injurious to them, especially if they are planted on a moist loam or clay; in which case, if the clay is near the surface, it will be the

best way to raise the ground in a hill, where each tree is to be planted, which will advance their roots above the surface of the ground, so that they will not be in danger of rotting in winter with moisture.

When these trees are propagated by suckers taken from old trees, they are commonly laid into the ground in rows pretty close together in beds, where, in dry weather, they may be frequently watered to encourage their putting out roots. In these beds they are left commonly two years, by which time those that live will be rooted (though a great many of them generally die); then they are transplanted into the nursery, and managed as hath been directed for the layers.

There are some who raise the Witch Elm from seeds, which it generally produces in great plenty, and are ripe in May; these should be sown upon a bed of fresh loamy earth, and gently covered. In dry weather they should be watered, and if the bed is shaded from the violent heat of the sun, it will be of great service to the seeds (for I always observe the plants to come up better in the shade than when exposed to the sun). When the plants come up they should be carefully cleared from weeds, and after they have stood two years in the seed bed they will be fit to plant out into the nursery, where they must be managed as the former.

VOLKAMERIA. *Lin. Gen. Plant.* 706.

The Characters are,

It hath a ringent flower of one petal, whose tube is much longer than the empalement; the brim is cut into five parts. It has four long slender stamina, two being shorter than the other, with a four-cornered germen, having a long style crowned by a bifid stigma. The germen turns to a roundish berry with two cells, including a nut with two cells.

The Species are,

1. VOLKAMERIA *spinis petiolorum rudimentis.* *Lin. Sp. Plant.* 637. Prickly Volkameria.

2. VOLKAMERIA *ramis inermibus.* *Lin. Sp. Plant.* 637. Smooth Volkameria.

The first sort grows naturally in the *West India* islands, where it rises to the height of twenty feet, having many pliable branches which are much diffused, covered with a light smooth bark, garnished with oval, spear-shaped, lucid leaves placed opposite. The flowers come out from the side of the stalk, five or six standing on the same foot-stalk, almost in form of an umbel; they are in shape somewhat like those of the common Jasmine, but the tube is curved, and two of the stamina are longer than the other, so it comes under the class of ringent flowers. They have no scent, and are not succeeded by seeds in *England*, nor are the plants very free to flower here.

The second sort is also a native of both *Indies*; this rises higher than the former, the stem and branches are stronger, and grow more erect; the bark is very white; but have short crooked spines immediately under the foot-stalk of the leaves. The leaves frequently grow round the branches in clusters or whorls. The flowers are set upon long foot-stalks arising from the wings of the stalk, each supporting several flowers, which generally stand erect. They are shaped like those of the former, have no scent, nor are succeeded by seeds here.

As these do not produce seeds in *England*, so the plants are propagated by cuttings, which readily put out roots, when they are planted in pots and plunged into a moderate hot-bed, covering them close with hand glasses to screen them from the external air. The cuttings may be planted any time from the middle of *May* to the end of *July*; if they are planted later in the season, there will not be summer enough for them to get strong roots before the cold of autumn; nor sooner than *May*, because their shoots will not be hardened enough for planting.

When they have put out roots the plants should be carefully separated, and each planted into a separate small pot, and plunged into a gentle hot-bed, to get fresh roots in the pots; then they may be inured to the open air provided the weather is warm, and may remain abroad in a sheltered situation until the nights begin to be cold, when they must be removed into the house, for cold will soon destroy them.

In winter these plants will require some warmth, so should be placed in a stove where the air is never greatly warmed, because in heat they are very subject to shoot and grow weak; but in a common green-house they will not live through the winter.

URENA. *Hort. Elth.* 319. *Lin. Gen. Plant.* 754. Indian Mallow.

The Characters are,

It hath a malvaceous flower with a double empalement, the outer being of one leaf slightly cut at the brim into five parts, but the inner is five-leaved, permanent, and cut to the bottom. The flower is composed of five leaves which are oblong, and blunt at their extremity, but narrow at their base, where they coalesce. In the center there are many stamina which are joined, and form a column at their base, but spread open above. It has a roundish five-cornered germen with a single style, and ten hairy reflexed stigmas. The germen changes to a pentagonal fruit which is burry, and divides into five cells, each having one angular seed.

The Species are,

1. URENA *foliis angulatis.* *Hort. Cliff.* 348. Indian Mallow with angular leaves.

2. URENA *foliis inferioribus angulatis, superioribus trilobis quinquelobisque acutè serratis.* Urena with angular lower leaves, the upper ones divided into three or five lobes which are sharply sawed; or Indian shrubby Vervain Mallow from *Bengal*.

3. URENA *foliis sinuato-multifidis villosis.* *Flor. Zeyl.* 257. Urena with sinuated hairy leaves having many points.

The first sort grows naturally in *China*; this rises with an upright stalk two feet high, which becomes ligneous toward the autumn. It sends out a few side branches which are taper, stiff, and have a dark green bark, garnished with roundish angular leaves, standing upon pretty long foot-stalks, of a dark green on their upper side and pale on their lower. The flowers come out single from the wings of the stalk, sitting close to it; they are shaped like those of the Mallow, but are small, and of a deep blush colour; these are succeeded by roundish capsules, armed with prickly hairs, divided into five cells, each containing one kidney-shaped seed.

The second sort grows naturally on the coast of *Malabar*, from whence I received the seeds; this rises with a ligneous stalk three feet high, dividing into four or five branches, which have a grayish bark, garnished with leaves of different forms; those on the lower part are angular, those above are cut some into three, and others have five angular obtuse lobes, of a dark green on their upper side, but pale on their under, sharply sawed on their edges, and stand upon long foot stalks. The flowers come out singly from the wings of the stalk; they are shaped like those of the other, but are larger. The petals are narrower at their base, and have deep red bottoms.

The seeds of the third sort came from *Malabar*; the stalks of this are hairy, and divide into many branches: it rises about two feet high, and is garnished with oblong leaves, divided into three obtuse lobes to the midrib. The lobes are indented in several parts; they are of a light green on both sides, and hairy. The flowers sit close to the stalks singly at the wings; they are shaped like those of the former, but are of a pale blush colour, with a deep red bottom.

These plants are propagated by seeds, which should be sown on a hot-bed early in the spring; and when the plants are fit to remove they should be transplanted into pots, and plunged into a fresh hot-bed to bring them forward, and afterward they must be treated in the same manner as hath been directed for the tender sorts of Hibiscus, to which the reader is desired to turn. If the plants are brought forward in the spring, and afterward placed in the stove, or under a deep frame, they will ripen seeds the first season; but if they should not, they may be preserved through the winter in the stove, and will ripen their seeds the following season, after which the plants seldom continue.

URTICA. *Tourn. Inst. R. H.* 534. *tab.* 308. The Nettle.

The Characters are,

It has male and female flowers at remote distances, sometimes on the same, and at others on separate plants. The male flowers have empalements composed of four roundish concave leaves, and have a pitcher-shaped nectarium in the center of the flower, and four awl-shaped spreading stamina terminated by summits with two cells. The female flowers have an oval permanent empalement with two valves; they have neither petals nor stamina, but an oval germen, without any style, crowned by a hairy stigma. The germen afterward turns to an oval compressed seed, which ripens in the empalement.

The Species are,

1. URTICA foliis oppositis cordatis, racemis geminis. *Lin. Sp. Plant.* 984. Nettle with heart-shaped leaves which are placed opposite, and double spikes of flowers; the great stinging Nettle.
2. URTICA foliis oppositis ovalibus. *Lin. Sp. Plant.* 984. Nettle with oval leaves which are placed opposite; smaller stinging Nettle.
3. URTICA foliis oppositis cordatis, amentis fructiferis globosis. Nettle with heart-shaped leaves placed opposite, and seed-bearing globular Katkins; commonly called Roman Nettle.
4. URTICA foliis oppositis ovato-lanceolatis, subintegerrimis, amentis fructiferis globosis. Nettle with oval spear-shaped leaves, which are almost entire, and placed opposite, and globular seed-bearing katkins; commonly called Spanish Marjoram.
5. URTICA foliis oppositis tripartitis incisiss. *Hort. Upsal.* 282. Nettle with leaves placed opposite, which are cut into three parts.
6. URTICA foliis oppositis oblongis, amentis cylindricis solitariis indivisis. *Lin. Sp. Plant.* 984. Nettle with oblong leaves which are placed opposite, and single, cylindrical, undivided katkins.
7. URTICA foliis oppositis ovato-lanceolatis acuminatis crenatis, amentis cylindricis indivisis. Nettle with oval, spear-shaped, acute-pointed, crenated leaves, which are placed opposite, and cylindrical undivided katkins.
8. URTICA foliis alternis cordato-ovatis, amentis racemosis distichis erectis. *Hort. Cliff.* 441. Nettle with oval heart-shaped leaves, which are placed alternate and erect, branching, double katkins.
9. URTICA foliis alternis orbiculato utrinque acutis subtus tomentosis. *Hort. Cliff.* 441. Nettle with orbicular leaves, pointed at both ends, placed opposite, and woolly on their under side.

The first of these sorts is a very common weed upon the sides of banks, ditches, and other uncultivated places, where its roots will spread, and over-run the grounds, so that it should always be carefully extirpated from gardens; it is sometimes used in medicine, but may easily be procured from the fields at almost any season.

The second sort is also a very common weed in gardens and cultivated fields; but it being an annual plant, is not so difficult to eradicate as the former.

These plants are so well known as to need no description.

The third sort grows naturally in *Romney* marsh, and near *Yarmouth*; this is an annual plant which rises three feet high. The stalk is herbaceous, thick, of a purple colour, armed in every part with stinging hairs. The branches come out opposite. The leaves are heart-shaped, ending in acute points, deeply sawed on their edges, and stand opposite upon long foot-stalks; these are also armed with stinging hairs on both sides. The male and female flowers come out from the wings of the leaves, at the same joint on each side the stalk; the male standing above the female, upon long slender foot-stalks or katkins, placed very loosely. The female flowers have shorter foot-stalks, and are in globular heads; these are succeeded by smooth shining seeds like those of the flax.

There is a variety of this growing naturally in the *Balearick* islands, which was discovered by Mr. *Salvadore*, an apothecary in *Barcelona*, who sent the seeds to *England*, which were sown in the *Chelsea* garden, but the plants, when cultivated, approached so near to the last mentioned sort, in every part except the colour of the stalk, as to make it doubtful of its being a distinct species.

The fourth sort grows naturally in *Spain* and *Italy*; this is also an annual plant, whose stalks are much slenderer than those of the former, and seldom branch. The leaves are placed by pairs, upon very slender foot-stalks; they are oval, spear-shaped, and for the most part entire, and have male and female flowers springing from the wings of the leaves, which are shaped like the former, the whole plant being armed with stinging hairs.

These plants may be easily propagated, by sowing their seeds in *March* upon a bed of light earth; and when the plants are come up they should be transplanted into beds, or the borders of the pleasure garden, interspersing them amongst other plants, that they may not be easily discovered by persons whom there is a design to deceive, by gathering a sprig for them to smell to. After the plants have taken root they will require no farther care, but only to keep them clear weeds.

The seeds of the third sort are sometimes used in medicine.

The fifth sort grows naturally in *Tartary*; this has a perennial root, from which spring up many square stalks, which rise five or six feet high, garnished with oblong leaves, deeply cut into three lobes, which are acutely indented on their edges; these stand opposite upon long foot-stalks. The flowers are produced from the wings of the leaves in long cylindrical katkins; the male are produced on the lower part of the stalk, and the female on the upper; the latter are succeeded by seeds like those of flax, inclosed in the three-cornered empalement of the flower.

This plant is easily propagated either by seeds or parting of the roots, and will thrive in most soils or situations.

The sixth sort grows naturally in *Canada* and other parts of *North America*; it is an annual plant, with a lucid herbaceous stalk, which divides into several branches, garnished with oblong sawed leaves, having three longitudinal veins; they are placed opposite upon pretty long foot-stalks. The flowers are produced from the wings of the stalks in single katkins, which are not divided; they appear late in the year, and unless the autumn is very favourable, the seeds will not ripen in *England*.

The seventh sort grows naturally in *North America*; this has a perennial root, from which spring out many stalks from two to three feet high, garnished with oval spear-shaped leaves, placed opposite, standing upon long foot-stalks; they are crenated on their edges, and end in acute points. The flowers come out from the wings of the leaves in long, cylindrical, undivided katkins; the seeds do not ripen in *England*.

The eighth sort grows naturally in *Canada* and *Virginia*. The root is perennial; the stalks rise two feet high; the leaves are oval, heart-shaped, and stand alternately upon the stalks; the flowers come out in branching katkins from the wings of the stalks, but are not succeeded by seeds in this country.

The two last sorts are common in many *English* gardens, where they are preserved more for the sake of variety than for any beauty. They may be propagated by parting their roots in the spring, and planted in almost any soil or situation, and will endure the severest cold of this climate in the open air.

The ninth sort grows naturally in *China*, where it is titled *Peama*; this is a perennial plant, sending up many stalks from the root, which rise three or four feet high, garnished with oval leaves, drawing to points at both ends, sawed on their edges, of a deep green on their upper side, but very white on their under, and have five longitudinal veins; they are placed alternately, and stand upon very long slender foot stalks. The flowers spring from the wings of the stalk in loose katkins; these are not succeeded by seeds in *England*.

This may also be propagated by parting of the roots, which should be done in the spring, for at that season this plant is in its least vigour, the winter being the time when it is most flourishing.

The plants must be planted in pots filled with light earth, and as they are too tender to thrive without artificial heat in *England*, they should be kept in a temperate stove, and only exposed to the open air for three months in the heat of summer.

UVA. URSI. See *Arbutus*.

VULNERARIA. See *Anthyllis*.

UVULARIA. *Lin. Gen. Plant.* 373.

The Characters are,

The flower has no empalement; it has six oblong, erect, spear-shaped petals, and six awl-shaped stamina, terminated by oblong, erect, four-cornered summits; it has an oblong, obtuse, three-cornered germen, supporting a style longer than the stamina, crowned by a triple, obtuse, spreading stigma. The germen af-

terward turns to an oblong obtuse capsule, with three lobes and as many cells, filled with flat orbicular seeds, ranged in a double order.

The Species are,

1. UVULARIA *foliis amplexicaulibus. Lin. Sp. Plant.* 304. Uvularia with leaves embracing the stalk.

2. UVULARIA *foliis perfoliatis. Amœn. Acad.* 2. p. 3. Uvularia with perfoliate leaves.

The first sort grows naturally in *Bohemia* and *Saxony*. The root is perennial, but the stalk is annual; it rises about two feet high, sending out one or two branches from the lower part, garnished with oblong smooth leaves, ending in acute points, whose base embrace the stalks. The flowers come out singly from the bosom of the leaves upon long slender foot-stalks; they are composed of six oblong naked petals, of a yellowish colour; these hang downward, but are rarely succeeded by seeds here.

The second sort grows naturally in *North America*; this has a perennial root and an annual stalk. The root is composed of many thick fleshy fibres, from which spring up several stalks, which for the most part divide into two at a small height from the ground, and are garnished with oblong, smooth, pointed leaves, which are broad at their base, surrounding the stalk in such a manner, as if the stalk run through them. The flowers are composed of six oblong yellow petals, ending in acute points; these stand upon slender foot-stalks, which arise from the bosom of the leaves, and hang downward, but are not succeeded by seeds in *England*.

They are both very hardy plants, and will live in the full ground; but as the flowers have not much beauty, so they are only cultivated for the sake of variety; they are propagated by parting of their roots. The best season for removing them is about *Michaelmas*, when their roots may be separated, and planted in the borders of the flower-garden; but this should only be done every third year, for if they are often removed, the plants will not thrive so well or flower so strong, as when they stand two or three years unremoved; they delight in a soil not too wet or stiff, but a gentle Hazel loam.

W.

W A C

WACHENDORFIA. *Burman.*

The Characters are,

The flowers are ranged alternately in clusters on the side of the stalk, each cluster having acute-pointed spathæ; each flower has six oblong petals, the three upper are erect, spread open, and are joined at bottom; two on the side spread open like wings; the lower forms a kind of keel; it has a protuberant nectarium on each side the upper petal, with three awl-shaped stamina, which decline, terminated by horizontal summits, and an oval three-cornered germen, supporting one awl-shaped style, crowned by a single stigma. The germen afterward turns to an oval, three-cornered, hairy capsule, with three cells, containing three oval seeds.

The Species are,

1. WACHENDORFIA *scapo simplici. Lin. Sp. Plant.* Wachendorfia with a simple stalk.

W A C

2. WACHENDORFIA *scapo polystachio. Lin. Sp. Plant.* Wachendorfia with stalks sending out many flower stems.

These plants grow naturally at the *Cape of Good Hope*; the roots of both have many strong fibres springing from a fleshy head; out of these heads arise several plaited leaves; those of the first are much smaller than the second sort; from the center arises the flower-stalk, which in the first sort is strait, simple, and about a foot and a half high, garnished with white flowers, disposed in loose spikes; but the stalk of the second sort rises more than three feet high, sending out alternately clusters of flowers, each cluster being covered with a spatha, which withers and remains on the stalk till it decays. The flowers of this are larger than those of the first sort, and are of an herbaceous white, inclining to yellow. The petals are divided into six parts almost to the bottom; they have each three stamina and

one style, which sits on the germen, crowned by horizontal summits. The germen afterward becomes an oval three-cornered capsule, having three cells, containing three oval seeds.

These plants are usually propagated by offsets, which come out from the side of their roots, because their seeds do not often come to perfection in *England*; but when they do, if they are sown in pots soon after they are ripe, and the pots placed in a garden-frame in the autumn to screen the seeds from frost, the plants will come up the following spring; and when they are strong enough to remove, they should be each planted in a separate small pot, and may be exposed abroad till the autumn; then they should be placed under a frame to screen them from frost, for they will not live in the open air through the winter in *England*. The second year the plants will flower, and if the season is warm, the seeds will ripen in autumn.

The offsets which are taken from the old roots, must be planted in separate pots, and after they have taken root, should be treated in the same way.

WALKERIA.

The Characters are,

The empalement of the flower is of one piece, cut half way into five segments, which are reflexed; the corolla of the flower is of one petal, deeply divided into five segments, which are concave; it has five incurved stamina, which are shorter than the petal, crowned by oval summits, and a conical germen without any style, crowned by a small blunt stigma. The germen afterward turns to a conical capsule, divided into five cells, each containing one angular seed.

The title of this genus is given in honour of Doctor Richard Walker, Vice-Master of Trinity-College in Cambridge, who is a great lover of botany, and has lately established a botanick garden in Cambridge, for the public use of the university.

We have but one species of this genus, the seeds of which were brought from the *East-Indies*, but from what particular part we are not acquainted.

It is an annual plant, whose branches are diffused and trail upon the ground, garnished with roundish leaves about the size of those of Chickweed, but of a thicker consistence, and of a bluish colour, standing upon short foot-stalks: the flowers come out from the wings of the stalk at each joint, having very short foot-stalks; the flower is of one petal, shaped like those of the Winter Cherry, but of a fine blue colour; these are each succeeded by conical capsules, divided into five cells, each containing one angular seed.

It is propagated by seeds, which must be sown upon a hot-bed early in the spring; but as the seeds do frequently lye long in the ground, so it is the surest way to sow them in small pots, and plunge them into a hot-bed, because if the plants do not rise in due time, the pots may be removed to another hot-bed, which will cause the seeds to vegetate. When the plants come up, and are strong enough to remove, they should be planted into separate small pots, and plunged into a hot-bed of tanners bark, shading them until they have taken root again; after which time they should have a large share of fresh air admitted to them in warm weather, and duly watered. The beginning of *July* they will flower, and the seeds will ripen in autumn; but if the plants should come up late in summer, and not perfect their seeds, if the pots are removed in autumn, and plunged into the tan-bed in the stove, the plants may be preserved through the winter, so will flower early the next summer, and thereby good seeds may be obtained; but when the plants come up early, and produce good seeds the same year, they seldom continue longer.

WALKS are made either of gravel, sand, or Grass; these three sorts of walks are the most common in *England*, but where gravel or sand cannot be procured, they are

sometimes laid with powdered coal, sea-coal ashes, and sometimes of powdered brick, but these are rarely used, when either gravel or sand can be procured; however, where sea-coal ashes can be had, it is preferable to the powdered coal or bricks, because they bind very hard, and never stick to the feet in frosty weather, which is a good quality, but the darkness of its colour has been an objection to the use of it in gardens; however, for wilderness-walks I think it is preferable to most other materials, but I shall proceed to give directions for the making of the several sorts of walks, and first of the gravel-walks.

In order to the laying of walks in gardens, when they are marked out, the earth should be taken away to a certain depth, that the bottom of them may be filled with some lime-rubbish, or coarse gravel, flint stones, or other rocky materials, which will be serviceable to prevent weeds from growing through the gravel, and also to keep away worm-casts. This bottom should be laid ten inches or a foot thick, over which the coat of gravel should be six or eight inches; which gravel should be fine, but yet not screened, because that spoils it. This should be laid on a heap, rounding, that the larger rough stones may run down on the sides, which being every now and then raked off, the gravel by that means will be sufficiently fine.

After the gravel has been laid to the thickness above-mentioned, then the walks must be exactly levelled, and raked true from all great drips, as well as little holes. By this means most of the stones of the walks will be raked under your feet, which should rather be gently sprinkled back again, over the last length that is raked, than buried (as is the practice of many gardeners); for by this means the walk will lie much harder, and the coarsest stones will very much contribute to its firmness.

There is also a great fault committed frequently, in laying walks too round, and some to that degree, that they cannot be walked on with that ease and pleasure that ought to be.

The common allowance for a gravel-walk of five feet breadth, is an inch rise in crown; so that if a walk be twenty feet wide, according to this proportion, it will be four inches higher in the middle than on each side, and a walk of twenty-five feet will be five inches, one of thirty feet six inches, and so on.

When a walk has been thus carefully laid, trodden down, and raked, or rather, after every length or part of it (which commonly is about fifteen feet each), then it should be rolled well, both in length and also cross-ways. The person who rolls it, should wear shoes with flat heels, that he may not make holes in the walks, for when these are once made in a new walk, it will not be easy to roll them out again.

In order to lay gravel-walks firm, it will be necessary to give them three or four water-rollings, that is, they must be rolled when it rains so very fast, that the walks swim with water; this will cause the gravel to bind, so that when the walks come to be dry, they will be as hard as terrace.

Iron-mould gravel is accounted the best for binding, or gravel with a little binding loam amongst it; which latter, though it be apt to stick to the heels of shoes in wet weather, yet nothing binds better in dry weather.

When the gravel is over-sandy or sharp, loam is frequently mixed with it, which, if they be cast together in heaps, and well mixed, will bind like a rock; whereas loose gravel is as uncomfortable and uneasy to walk on, as any other fault in a walk can render it.

The best gravel for walks is such as abounds with smooth pebbles (as is that dug at *Black beath*), which, being mixed with a due proportion of loam, will bind like a rock, and is never injured by wet or dry weather, and the pebbles being smooth, are not so liable to be turned up, and loosened

by the feet in walking, as are those which are angular and rough; for where walks are laid with such gravel as is full of irregular stones, they appear unsightly in a day's time after rolling, because the stones will rise upon the surface whenever they are walked upon, but the smooth pebbles will remain handsome two or three days without rolling.

Gravel-walks are not only very necessary near the house, but there should always be one carried quite round the garden, because, being soon dry after rain, they are proper for walking on in all seasons; but then these should be narrow, and those adjoining to the house ought to be large and magnificent, proportionable to the grandeur of the house and garden. The principal of these walks should be elevated, and carried parallel with the house, so as to form a terrace; this should extend itself each way, in proportion to the width of the garden; so that from this there may be a communication with the side-walks, without going on the Grass, that there may be a dry walk continued quite through the gardens; but there is not a more ridiculous sight, than that of a strait gravel-walk leading to the front of the house, intersecting the Grass, so as to make it appear like the stiff formal Grass-plats frequently made in little court-yards by persons of low taste.

Grass-walks in gardens were formerly in great esteem, and looked upon as necessary ornaments to a garden; but of late years they have justly been banished by every person of true taste, for those narrow slips of Grass were very unsightly, and far from being ornamental, and for the most part useless, being generally too damp for persons of tender constitutions to walk upon; and whenever they were constantly used, they became bare in the places frequently trodden, so were rendered more unsightly; and as the intention of walks in gardens is to have at all seasons a dry communication throughout the garden, for exercise and recreation, Grass-walks were very improper, because every shower of rain made them so wet, as not to be fit for use a considerable time, and the dews render them too damp for use either in the morning or evening; and if the Grass of walks is not very fine and short, like that of the downs, it will be very troublesome to walk upon; besides, whenever the ground is so dry, as that persons may with safety walk upon Grass, the lawns and other parts of verdure in gardens are better adapted for use, than any of those formal stiff walks, which were so much esteemed in the last age.

Having given directions for the making of gravel-walks, I shall come next to treat of sand walks, which are now very frequently made in gardens, as being less expensive in the making, and also in keeping, than the former; and in very large irregular gardens, which are such as most persons esteem, this is a very great article; for as the greatest part of the walks which are made in gardens, are carried about in an irregular manner, it would be very difficult to keep them handsome, if they were laid with gravel, especially where they are shaded by trees, for the dripping of the water from their branches, in hard rains, is apt to wash the gravel in holes, and render the walks very unsightly; and when these wood-walks are of Grass, they do not appear sightly, nor are they very proper for walking on; for after rain they continue so long damp as to render them unfit for use, and the Grass generally grows spiry and weak for want of air, and by the continual dropping of the trees, will by degrees be destroyed; therefore it is much better to lay these walks with sand, which will be dry and wholesome; and whenever they appear mossy, or any weeds begin to grow on them, if they are scuffled over with a *Dutch* hoe in dry weather, and then raked smooth, it will destroy the weeds and moss, and make the walks appear as fresh and handsome as if they had been new laid.

In the modern way of laying out gardens, the walks are

carried through woods and plantations, so that these are shady and convenient for walking in the middle of the day. These are usually carried about, winding as much as the ground will admit of, so as to leave a sufficient thickness of wood to make the walks private; and that the persons who are walking in one part of them, may not be seen by those who are in any of the other parts. Where these walks are contrived with judgment, a small extent of ground will admit of a great many turns, so that a person may walk some miles in a small garden. But these turns should be made as natural as possible, so as not to appear too much like a work of art, which will never please so long as the former.

The breadth of these walks must be proportioned to the size of the ground, which in a large extent may be eight or ten feet wide; but in small gardens five or six feet will be sufficient. As the walks are designed to wind as much as the ground will allow, so this width will be sufficient, because the wider they are, the greater must be the turns, otherwise the walks will not be private for any distance. Besides, as it will be proper to line the sides of these walks with Honeysuckles, Sweet-briar, Roses, and many other sweet-flowering shrubs, so the tall trees should be placed at least five or six feet from the walk, to allow room for these. But as I shall particularly treat of the method of laying out wildernesses, and planting of them, in such a manner as to render them as nearly resembling a natural wood as possible, under its proper head, I shall add nothing more in this place, except a few common directions for making of these sand-walks.

When the ground is traced out in the manner as the walks are designed, the earth should be taken out of the walks, and laid in the quarters. The depth of this must be proportioned to the nature of the soil, for where the ground is dry, the walks need not be elevated much above the quarters, so the earth should be taken out four or five inches deep in such places; but where the ground is wet, the bottom of the walks need not be more than two inches below the surface, that the walks may be raised so high, as to throw off the wet into the quarters, which will render them more dry and healthy to walk on.

After the earth is taken out of the intended depth, the bottom of the walks should be laid with rubbish, coarse gravel, or whatever of the like nature can be most readily procured. This should be four, five, or six inches thick, and beaten down as close as possible, to prevent the worms from working through it; then the sand should be laid upon this about three inches thick, and after treading it down as close as possible, it should be raked over to level and smooth the surface. In doing of this, the whole should be laid a little rounding to throw off the wet, but there will be no necessity of observing any exactness therein; for as the whole ground is to have as little appearance of art as possible, the rounding of these walks should be as natural, and only so contrived as that the water may have free passage from them.

The sand with which these walks are laid should be such as will bind, otherwise it will be very troublesome to walk on them in dry weather; for if the sand be of a loose nature, it will be moved with strong gales of wind, and in dry weather will slide from under the feet. If, after these walks are laid, they are well rolled two or three times, it will settle them, and cause them to be firm. If the sand is too much inclinable to loam, it will also be attended with as ill consequence as that which is too loose, for this will stick to the feet after every rain; so that where sand can be obtained of a middle nature, it should always be preferred.

In some countries where sand cannot be easily procured, these walks may be laid with sea-shells well pounded, so as to reduce them to a powder, which will bind extremely well,

well, provided they are rolled now and then; but where none of these can be easily procured, sea-coal ashes, or whatever else can be gotten, which will bind and be dry to the feet, may be used for this purpose; and where any of these can only be had in small quantities, the walks should have a greater share of rubbish laid in their bottom, and these spread thinly over them; and in most places rubbish, rough stones, or coarse gravel, may be easily procured.

WALLS are absolutely necessary in gardens, for the ripening of all such fruits as are too delicate to be perfected in this country without such assistance. These are built with different materials; in some countries they are built of stone, in others with brick, according as the materials can be procured best and cheapest.

Of all materials proper for building walls for fruit-trees, brick is the best, in that it is not only the handsomest, but the warmest and kindest for the ripening of fruit; besides that, it affords the best conveniency of nailing, for smaller nails will serve in them than in stone walls, especially if the joints are not too large; and brick walls, with copings of free-stone, and stone pilasters or columns, at proper distances, to separate the trees, and break off the force of the winds, make not only the most beautiful, but the most durable walls.

In some parts of *England* there are walls built both of brick and stone, which have been very commodious. The bricks of some places are not of themselves substantial enough for walls, nor are they any where so durable as stone; and therefore some persons, that they might have walls both substantial and wholesome, have built double ones, the outside being of stone and the inside brick, or a stone wall lined with brick; but when these are built, there must be great care taken to bind the bricks well into the stone, otherwise they are very apt to separate one from the other, especially when hard frost comes after much wet; which swells the mortar, and frequently throws down the bricks, when the walls are only faced with them and not well tied into the stone.

Where the walls are built entirely of stone, there should be trellises fixed up against them, for the more convenient fastening the branches of the trees; the timbers of these espaliers need not be more than an inch and a half thick, and about two inches and a half broad; these should be fixed cross each other, at about four inches distance; for if they are at a much greater distance, it will be difficult to fasten the shoots of the trees properly. As this trellis will be laid close to the wall, the branches of the trees will lie about two inches from the wall, in which position the fruit will ripen better than when it lies close to the wall; so that there should always be these espaliers framed against them, which will render these walls very good for fruit-trees, which, without the espaliers, seldom are found to answer the purpose of ripening the fruits well, besides the inconvenience of having no good fastening for the branches of the trees.

There have been several trials made of walls built in different forms; some of them having been built semicircular, others in angles of various forms, and projecting more towards the north, to screen off the cold winds; but there has not been any method as yet, which has succeeded near so well, as that of making the walls strait and building them upright.

The fairest trial which I have seen made of circular walls was at *Goodwood* in *Suffex*, the seat of the duke of *Richmond*, where, in the middle of two south walls, there were two large segments of circles, in which there were the same sorts of fruit-trees planted, as against the strait parts of the walls; but there never was any fruit upon the trees in the circular part of the walls which came to maturity,

nor were the trees of long continuance, being blighted every spring, and in a few years were totally destroyed; and when the branches of those trees, which grew upon the strait part of the walls, had extended themselves so far as to admit of their being led into the circular parts of the walls, they were constantly blighted and killed.

When the trees which had been planted in the circular parts were destroyed, the walls were filled with Vines; but the Grapes of the same sort were a full month later than those growing against the strait parts of the walls; so that they rarely ripened, which occasioned their being rooted out, and figs were afterwards planted, but the fruit of these succeeded little better; nor can it be supposed, that any trees or plants will thrive so well in these circles, where there is a constant draught of air round them, which renders the situation much colder than the open free air.

I have also seen, at Mr. *Le Cour's* garden in *Holland*, some walls built in angles of different forms; but these succeeded no better than the circles before mentioned; for I did not find one tree in health against the walls, nor did they produce fruit.

There are several other schemes which have been proposed by different persons, for the building of walls to accelerate the ripening of fruits; among which there was a very ingenious book written some years ago, intitled, *Fruit-walls improved, by inclining them to the horizon*; in which the author has shewn, by calculation, that there will be a much greater number of the rays of the sun fall upon such walls, than upon those which are built perpendicular; and from thence has drawn calculations, that walls so built will be of great service in the accelerating of fruit; and he has taken the trouble of calculating the different inclinations, which such walls should have in the different climates, in order to receive the greatest number of the sun's rays. This theory seems to have all the demonstration necessary for its support, but upon trial has not succeeded in the least; for as these walls must be built against banks of earth, the damps which arise from the ground overbalance the advantage of the sun's rays; besides, these sloping walls being much more exposed to the cold dews in the night, the fruit will be more chilled thereby; and in the spring the morning frosts will prove much more destructive to the tender blossoms of the fruit-trees, as they will be more exposed to them than against an upright wall; add to this their being much more exposed to the winds and the rain, and it will be found, by comparing the advantages proposed from these walls, with the disadvantages to which the fruit-trees will be exposed, that upright walls will have the preference; for it is not the strongest rays of the sun, in the heat of summer, which are so much wanting for ripening of fruit, as the continuance of a moderate share of warmth; and, above all, the having of the sun in a morning, to dry off the cold dews of the night early, is of the greatest use; and in this respect the upright walls are much preferable to the sloping, as they will have the direct rays of the sun in the morning, which will be oblique on the other.

There are some persons who recommend the painting of walls black, or of a dark colour, as they suppose the dark colour will imbibe more of the sun's rays, so will retain the warmth longer; this also answers better in theory than in practice; for although it must be allowed, that a black wall is warmer to the touch than a common brick wall, yet, as the fruit generally is situated at a small distance from the wall, it receives no benefit from the warmth of the wall, but it is the reflected heat which accelerates the ripening of fruit; therefore I would advise every one to make fair trials of these things before they put them in practice, and not take upon trust what they may be told by persons, who are

too sanguine in recommending to others schemes, which they have adopted upon very slight principles, or perhaps upon a single trial; this painting of the walls is recommended by the same person who wrote upon inclining walls, and he has proposed this upon the same principles; but the introducing of these schemes should be avoided, until there have been sufficient trials made to warrant their use.

Where persons are willing to be at the expence in the building of their walls substantial, they will find it answer much better than those which are slightly built, not only in their duration, but also in their warmth; therefore a wall two bricks thick, will be found to answer better than one brick and a half; and if in the building of garden walls they are grouted with soft mortar, to fill and close all the joints, the walls will be much stronger, and the air will not so easily penetrate through them, as it does through those which are built in the common way.

According to the modern taste in gardening, there are very few walls built round gardens, which is certainly very right; not only with regard to the pleasure of viewing the neighbouring country from the garden, but also in regard to the expence, therefore the quantity of walling should be proportioned to the fruit consumed in the family; but as it will be necessary to inclose the kitchen-garden, for the security of the garden stuff, so, if that be walled round, it will contain as much fruit as will be usually wanted in the family, because the kitchen-garden is always proportioned to the number of persons maintained; but if the quantity of walling which surrounds the kitchen-garden, should be judged too little for the supply of fruit, there may be a cross wall built through the middle of the kitchen-garden; or, where the size of the garden will admit, there may be two cross walls built; but this must not be done, where there is not room to place the walls at least eighty or one hundred feet asunder, and if they are allowed a much greater distance it will be better; and as the kitchen garden should always be placed out of sight from the house, the walls may be hid by plantations of shrubs at some little distance.

The best aspect for walls in *England* is, to have one point to the eastward of the south; for these will enjoy the benefit of the morning sun, and will be less exposed to the west and south-west winds (which are very injurious to fruits in *England*) than those walls which are built due south. I know there are many persons who object to the turning of walls the least point to the east, on account of the blights which they say come from that quarter in the spring; but from many years experience and observation I can affirm, that blights as often attack those walls which are open to the south-west, as those which are built to any other aspect; and I believe, whoever will be at the trouble to observe for seven years, which aspected walls suffer most from blights, will find those which are built with a point to the eastward of the south, as seldom blighted as those which are turned to any other aspect; therefore, in the contrivance of a kitchen garden, there should be as great length of these walls built as the situation of the ground will admit.

The next best aspect is due south, and the next to that south east, which is preferable to the south-west for the reasons before assigned; but as there will, for the most part, be south-west and west walls in every garden, these may be planted with some sorts of fruit, which do not require so much heat to ripen them as those designed for the best walls; but wherever there are north walls, those will only be proper for baking Pears, Plums, and Morello Cherries for preserving; or some Duke Cherries may be planted against these walls, to continue them longer in the season, which will be found useful in supplying the table till Peaches, Nectarines, and Plums are ripe.

Where persons are very curious to have good fruit they erect a trellis against their walls, which projects out about two inches from them, to which they fasten their trees; which is an excellent method, because the fruit will be at a proper distance from the walls, so as not to be injured by them, and will have all the advantage of their heat; and by this method the walls will not be injured by driving nails into their joints, which, by every year being drawn out, draws out the mortar from between the bricks, and thereby makes holes, in which snails and other vermin will harbour and destroy the fruit, and also impair the wall.

These trellises may be contrived according to the sorts of fruit which are planted against them. Those which are designed for Peaches, Nectarines, and Apricots (which, for the most part, produce their fruit on the young wood), should have their rails three, or, at most, four inches asunder every way; but for the other sorts of fruit, which continue bearing on the old wood, they may be five or six inches apart; and those for Vines may be eight or nine inches distance. For as the shoots of Vines are always trained at a much greater distance than those of any other sort of fruit, the trellises for these need not be near so close, especially as those for Peaches and Nectarines, whose shoots are generally shortened to about five or six inches or less; so that if the rails are not pretty close, many of the short branches cannot be fastened to them.

These trellises may be made of any sort of timber, according to the expence which the owner is willing to bestow; but fir is most commonly used for this purpose, which, if made of yellow deal, well dried and painted, will last many years; but if any person will go to the expence of Oak, it will last sound much longer; but those who are unwilling to be at the expence of either, a trellis may be made of Ash-poles, in the same manner as is practised in making espaliers for counter borders, with this difference only, that every fourth upright rail or post should be stronger, and fastened with iron hooks to the wall, which will support the whole; and as these rails must be laid much closer together than is generally practised for espaliers, these strong upright rails or posts will not be farther distant than four or five feet from each other. To these the cross rails which are laid horizontally should be well nailed, which will secure them from being displaced, and also strengthen the trellises; but to the other smaller upright poles they need only be fastened with wire. To these trellises the shoots of the trees should be fastened with Osier-twigs, rope-yarn, or any other soft bandage, for they must not be nailed to it, because that will decay the wood work.

These trellises need not be erected until the trees are well spread, and begin to bear fruit plentifully; before which time the young trees may be trained up against any ordinary low espaliers, made of a few slender Ash poles, or any other slender sticks; by which contrivance the trellises will be new when the trees come to bearing, and will last many years after the trees have overspread them; whereas, when they are made before the trees are planted, they will be half rotten before the trees attain half their growth.

When these trellises are intended to be made against new walls, it will be proper to fasten some strong iron hooks into the wall as it is built, at the distance which the upright posts are intended to be placed; because when these are afterwards driven into the wall, they displace the mortar in the joints, and injure the wall.

In the building of the walls round a kitchen garden, the insides, which are designed to be planted with fruit-trees, should be made as plain as possible, so that the piers should not project on those sides above four inches at most, and these should be placed about fourteen feet asunder, in such walls

walls as are designed for Peach and Nectarine trees; so that each tree may be planted exactly in the middle between the piers, which will render them more sightly, and be better for the trees; but where Apricots, Plums, or Cherries, are to be planted, the piers may be only ten feet asunder; and against every other pier the trees should be planted, which will allow them sufficient room to spread; as the trelase will project as forward as the piers, the branches of the trees may be spread as on a plain; but when the piers project no more on the inside of the garden, they should be built stronger on the outside, for the better supporting of the walls.

The usual thickness which garden walls are allowed, if built with bricks, is thirteen inches, which is one brick and a half, but this should be proportionable to the height; for if they are built twelve or fourteen feet high or more, as is sometimes practised, then the foundations of the walls should be carried up at least two bricks and a half thick, a foot or more above the level of the surface of the ground; then may be diminished on each side, to reduce them to the thickness of two bricks, which must be continued to the top of the walls; and the piers in these high walls should also be proportionably stronger than is commonly allowed to lower walls; for as these will be much more exposed to strong gales of wind, if they are not well built they will be in danger of being blown down; therefore the piers of these walls should be projected the length of a brick on their backside, and the thickness of a brick on their front; and if these are built about ten or twelve feet asunder, they will greatly strengthen the walls.

But there is no necessity for building walls higher than nine or ten feet, unless it be for Pears, which, if properly managed, will spread over a great compass of walling; but as only some of the latest winter Pears require the assistance of a wall, there need no more but that part of the wall, where these are designed, to be built higher; for Peaches and Nectarines never require a wall higher than nine or ten feet, provided they are rightly managed; because whenever they are carried to a greater height, the lower part of the wall is unfurnished with bearing branches; and although Apricots, Plums, and Cherries, will frequently grow higher, yet, if they are planted at a proper distance, and the branches trained horizontally from the bottom, they will not soon cover a wall of this height; and Vines may be kept as low as any sort of fruit, for when they are planted against low walls, they must be treated somewhat after the same manner as those in vineyards, which is, to cut off the greatest part of the wood which produced fruit the preceding year, and train in new shoots for the next year's bearing, which are rarely left a yard in length, therefore will not require very high walls.

If the Pears which are designed to be planted, are allowed a south-west aspect, on which they will ripen very well, then the wall to this aspect should be built fourteen feet high or more; for as these trees spread very far, when on free stocks, they should not be shortened and stopped in their growth, which will prevent their bearing. But I shall now proceed to give some directions for the building of hot-walls, to accelerate the ripening of fruits, which is now pretty much practised in *England*.

In some places these walls are built at a very great expence, and so contrived as to consume a great quantity of fuel; but where they are judiciously built, the first expence will not be near so great, nor will the charge of fuel be very considerable, because there will be no necessity of making fires more than three months, beginning about the middle or latter end of *January*, and ending by the middle of *May*, when there will be no want of fires, if the glasses are close shut every night, or in bad weather; for half an

hour's sun-shine on the glasses at that season, will sufficiently warm the air inclosed in the glasses, for the growth of any of our *European* fruits.

There are some persons who plant Vines, and other fruit-trees, by the sides of stoves, and draw some of their branches into the stove, in order to obtain early fruit, and very often train the Vines over the whole tan-bed; which is very wrong, where the stove is designed for the Ananas, because the air must be kept much warmer for them, than is required for Grapes or other fruits, so they can never succeed well together; for when there is only a sufficient quantity of air admitted for the growth of Grapes, the Ananas suffer for want of proper heat; and so, on the contrary, when the stove is kept up to the proper heat for the Ananas, it will be too hot for Grapes; therefore it will be proper to have the Vines on a particular wall by themselves, because these require to have a greater share of air admitted to them, when they begin to shoot, than most other sorts of fruit, so that it is by much the better method to have them separate.

The ordinary height of these hot walls is eight or nine feet, which will be sufficient for any of those sorts of fruits which are generally forced; for by forcing of the trees, they are commonly weakened in their growth, so that they will not grow so vigorously as those which are always exposed to the open air; and where there is not a quantity of walling planted sufficient to let one part rest every other year, the trees will never be very healthy, and will last but a few years. The quantity of walling to produce early fruit for a middling family, cannot be less than eighty or one hundred feet in length; therefore where a person is desirous to have the fruit in perfection, and the trees to continue in a good condition many years, there should be three times this quantity of walling built; so that by dividing it into three parts, there will be two years for the trees to recover their vigour between the times of their being forced; whereby a greater quantity of bearing wood may be obtained, and the fruit will be fairer and in larger quantities than when they are forced every year, or every other year; and as the glasses may be contrived so as to move from one to the other, the expence of building the walls so much longer, will not be very great, because the frames and glasses need not be more than for one year's fruit.

The foundations of these walls should be made four bricks and a half thick, in order to support the flues; otherwise, if part of them rest on brick work, and the other part on the ground, they will settle unequally, and soon be out of order; for wherever there happen any cracks in the flues, through which the smoke can make its escape, it will prevent their drawing; and if the smoke gets within the glasses, it will greatly injure the fruit. This thickness of wall need not be continued more than six inches above the ground, where should be the foundation or bottom of the first flue, which will raise it above the damps of the earth; then the walls may be set off four inches on each side, which will reduce it to the thickness of three bricks and a half, so that the back wall may be two bricks thick, which is absolutely necessary to throw the heat out more in front; for when the back walls are built too thin, the heat will escape through them. The wall in front next to the fruit will be only four inches thick, whereby there will be allowance of nine inches for the flues, which may be covered with twelve inch tiles; for if they have an inch and a half bearing on each side, it will be sufficient.

The ovens in which the fires are made, must be contrived on the backside of the walls, which should be in number proportionable to the length of the walls. The length usually allowed for each fire to warm is forty feet, though they will do very well for fifty; but I would not

advise the flues to be longer than this to each fire, because when the ovens are made at a great distance, there is a necessity of making the fires so much stronger to warm the walls, which will occasion the heat to be too violent near the fires. These ovens should be shedded over, to keep out the wind and rain, otherwise the fires will not burn equally. Some people make these sheds of timber, but it is much better to build them of brick, and tile them over; because the wooden sheds will in a few years decay, and afterwards will be a constant charge to keep in repair; and besides they may be in danger of firing, if great care is not constantly taken of the fires. As it is absolutely necessary to have ovens below the foundation of the first flues, there must be steps down into the sheds, to come to the mouth of the ovens to supply the fuel, therefore the sheds should not be narrower than eight feet in the clear; for as the steps will require four feet space, there should be at least four feet more for the person who attends the fire, to have room to turn himself to clear out the ashes and to put in the fuel. Where the length of walling requires two ovens, it will be proper to have them in the middle included in one shed, which will save expence and allow more room to attend the fires; for in this case the sheds must be at least ten feet long, and then they need not be more than six in breadth. The steps down into these should be at one end, so that the door opening into the sheds will not be opposite to the mouths of the ovens, therefore the fires will burn more regular; for whenever the doors are contrived to front the mouth of the ovens, if the winds set directly against them it will cause the fire to burn too fiercely, and the fuel will be soon consumed.

These ovens may be contrived in the same manner as those which are already described for stoves, wherefore I shall not repeat it again in this place; but must observe, that when the two ovens are joined together, there should be a partition wall at least three bricks thick between them, otherwise the fires will soon destroy it; and if there should be the least hole in the wall, through which the smoak of the two fires can communicate, it will prevent their drawing.

The lower flue, through which the smoak first passes from the fire, may be two feet and a half deep; therefore the back wall should be at least two and a half or three bricks thick, as high as to the top of this flue, then it may be set off to two bricks or two and a half thickness, which must be continued to the top of the wall. The second flue, which should return over the first, may be made two feet, the third a foot and a half, and the fourth one foot deep; which four flues, with their coverings, will rise near eight feet in height, so that there will be just room left for the fixing of the frames at the top to support the glasses under the coping of the wall: and these four returns will be sufficient to warm the air in the frames, for the smoak will have lost its heat by the time it has passed thus far.

In the carrying up of these walls there should be some strong iron hooks fastened at convenient distances, which should project one inch from the wall to which the trelase must be fastened, which is to support the trees. These hooks should be long enough to fasten into the back wall, for the wall in front, being but four inches thick, will not be strong enough to support the trelase; but in placing of them care should be taken not to lay them cross the middle of the flues, because they would obstruct the clearing them of soot whenever there should be occasion; so that the best way is to lay them just under the tiles which cover each flue at about three feet asunder, which will be near enough, provided the bars of the hooks are made sufficiently strong; but these should be flat, lest they obstruct the smoak. As the flues must be well plastered with loam on their inside, so likewise should the loam be spread under the tiles which

cover them, to the thickness of the hooks, that the flues may be very smooth. It will also be very proper to cover these flues on the side next the trelase with hop-bags, or some such coarse cloth, in the manner as hath been directed for the stoves, which will make them so tight that no smoak will find its way, which, without this covering, it is very apt to do through the joints of the walls, especially when they are so thin as these must be built; and this covering will also strengthen the wall of the flues, and join the whole work together. If at each end of these flues there are small arches turned in the back walls, in such a manner that there may be holes opened to clean the flues of soot whenever there is a necessity for it, the trouble will be much less than to open the flues in front; and there will be no damage done to the trees, nor will the flues be in the least injured by this, which they must be when they are opened in front.

The borders in front of these hot walls should be about four feet wide, which will make a sufficient declivity for the sloping glasses; and in these borders there may be a row of dwarf Peas planted to come early, or a row of dwarf kidney Beans, either of which will succeed very well; and if they are not planted too near the trees, will not do them much injury. On the outside of these borders should be low walls erected, which should rise three or four inches above the level of the borders, upon which the plate of timber should be laid on which the sloping glasses are to rest; and this wall will keep up the earth of the border, and also preserve the wood from rotting.

The glasses which are designed to cover these walls must be divided into two ranges; for as they must reach from the ground-plate (just above the level of the border) to almost the top of the wall they will be more than twelve feet long, which will be too great a length for single frames; which, when they are much more than six feet long, are too heavy to move, especially if the frames are made of a proper strength to sustain the glass. These frames should be contrived in such a manner, as that the upper row may slide down; and by making on one side three small holes in the wood work which supports the frames, at about a foot distance, and having a small iron pin to fix into them, the top glasses may be let down one, two, or three feet, according as there may be occasion to admit air. The lower row of glasses may be contrived so as to easily take out, but as they must lie sloping, and the upper row must bear on them, they cannot be contrived to slide upwards, nor indeed will there be any occasion for their moving, because it is much better to let the air in at the top than in the front of the trees.

The sloping timbers, which are to support the glass frames, must be fastened at bottom into the ground plate in the front of the border, and at the top into strong iron cramps fixed in the upper part of the wall for that purpose. These timbers should be made of Fir, which will not twist as Oak and some other wood will, where it is laid in such position. They must be made substantial, otherwise they will not last many years, especially as they are designed to be moveable. On the top of these should be fixed a strong board, under which the upper row of glasses should slide. The use of this board is, to secure the upper part of the glasses from being raised by the winds, and also to keep the wet from getting to the trees; therefore it should be joined as close as possible to the wall, and should project about two inches over the glass frames, which will be enough to throw the wet on the glasses, and likewise to secure them fast down.

The breadth of these frames for the glasses may be about three feet or a little more, according as the divisions of the length of the wall will admit; for a small matter in their width

width is of no consequence, provided they are not too wide to be easily moved; for when they are wider than a man can easily reach with his arms to manage, they will be very troublesome to carry from one place to another. The bars of these frames, which are to support the glasses, should be placed lengthwise of the frames; for when they are placed across, they stop the moisture which is lodged on the inside of the glasses, and cause it to fall in drops on the borders at every bar, which will be very injurious to any thing under them; and if it falls on the trees, will greatly damage them, especially when they are in blossom. The lead into which the glasses of these frames are fixed, should be very broad, and the joints well cemented; otherwise the wet will find an easy passage through, and do great damage to the fruit.

At each end of the range of glasses, there will be an angular space between the glasses and the wall, which must be closely stopped to prevent the air from getting in, which might greatly injure the fruit. These are by some persons closely boarded up; but if they are closed with glasses, so contrived as to open to let in air at proper times, it will be of great advantage; because when the wind may be too strong against the front glasses, one or both of these end glasses may be opened, according to the warmth of the air inclosed, which will be often very useful to cool the air, and to admit a small quantity of fresh air to the fruit.

The sorts of fruit which are usually planted for forcing, are Cherries, Plums, Peaches, Apricots, and Nectarines; but the last-mentioned seldom succeed well, nor will the trees continue long, so is scarce worth planting against hot walls. As for the Vines, I would propose they should be planted by themselves against a particular wall; for as they will require more air to be admitted to them when they begin to shoot, than any of the above-mentioned fruits, they will not succeed, if they are included in the same frame; but the others will do very well in the same border, and require the same temperature of warmth. The best of these sorts to plant against hot walls, are those here mentioned:

Cherries.

The Early May, and May Duke.

Plums.

The Early Black Damask, or Morocco.

The Great Damask Violet of *Tours*.The *Drap d'Or*.

Peaches.

The Red Nutmeg.

The Red *Magdelain*.The *Montauban*.

Nectarines:

Fairchild's Early Nutmeg.The *Elruge*.

Apricot.

The *Masculine*.

These being the sorts which ripen early, are the most proper to plant against these walls, although they are not so valuable as some other sorts of these fruits; yet, as they naturally ripen three weeks or a month earlier in the season, they will be very early ripe when they are brought forward by artificial warmth.

In the preparing of the borders for planting these fruit-trees, there should be the same care taken as for those against open borders; which, being fully treated of in another part of this work, I shall not repeat here. There must also be the same care in training up the trees when they shoot; but the trellises need not be made against these walls, until the trees are grown large enough to spread, and produce a great quantity of fruit; till which time they

may be supported by any low ordinary trellis, which will do very well till the time that the trees will have strength enough to force, which will not be until the fourth or fifth year after planting, according to the progress they have made; for if they are forced too young, it will weaken them so much, as that they seldom make vigorous trees afterwards; besides, the quantity of fruit which such young trees produce, is not worth the expence and trouble of forcing; for the quantity of fuel used, and the trouble, will be the same for small trees, which are not capable of producing more than six or eight fruit each, as for those trees which may produce three or four dozen; so that the greater time the trees have to grow before they are forced, the better they will pay for the trouble and expence.

When the trees have acquired strength enough to produce a quantity of fruit, that part which is designed to be forced the following spring, should be carefully pruned early in autumn; when the very weak shoots must be either entirely cut out, or pruned very short, because these, by being forced, will for the most part decay; and though some of them may be full of flower-buds, yet these shoots being weak, cannot nourish them; so that the flowers having exhausted all the sap, the shoots die soon after, and rarely produce any fruit, or at least do not bring them to perfection. The other more vigorous shoots should also be shortened to a proper length, after the same manner as is directed for those trees in the open air; with this difference only, *viz.* that these which are designed for forcing, should not have their shoots left so long, because the forcing of them will weaken them; and consequently, should there be as great a length of branches, there will probably be a greater number of fruit on them; because, as these will be screened from the open air, they will not be liable to blasts, or the injuries of frost; and the having too many fruit on the trees, will render them small, and also too much weaken the trees; then the shoots should be all regularly fastened to the trellis, at a proper distance from each other; so that when the branches shoot the following spring, they may not over-hang each other. The reason for my advising these trees to be pruned so early in the season, is, that those branches which are left on, may enjoy the whole nourishment of the sap; so that the buds will become very turgid during the winter season, and will be prepared to open when the fires are set to work.

The time for beginning to make the fires is about the middle or latter end of *January*, according as the season is more or less favourable; for if the trees are forced too early into flower, they will be in some danger of miscarrying, if the weather should prove severe; so that it is by much the surest method to begin about the time here directed, because there will be a necessity of admitting fresh air to the trees when they are in flower, which cannot be done with safety when they flower in very bad weather. And those trees which are forced into flower by the middle of *February*, will ripen their fruit as early as most people will desire to eat them; for the Cherries will ripen early in *April*, and the Apricots by the beginning of *May*; and soon after the Plums, Peaches, and Nectarines will be ripe.

There are some persons who plant Strawberries in their borders before the fruit-trees, in order to have early fruit, which often succeed very well; but wherever this is practised, great care should be taken to keep them from spreading over the border, because these plants will exhaust the principal goodness of the earth, and thereby injure the trees; so that when it is designed to have Strawberries in these borders, I would advise, that the roots should be either planted in pots, or singly at a good distance on a shady border of loamy earth, one year before they are designed to be forced; during which time the runners should be diligently

ligerly pulled off, to encourage the main roots for fruiting; and at *Michaelmas* these plants may be transplanted with large balls of earth to their roots, into the borders, before the fruit-trees which are to be forced the following spring, so that they may have time to get new root before that season; and if these plants are carefully watered when they begin to shew their flower-buds, they will produce a good quantity of fruit, which will ripen the latter end of *April*, or the beginning of *May*; but then I would also advise, that these plants be taken away as soon as they have done bearing, that they may not rob the trees of their nourishment.

Since I have mentioned this method of having early Strawberries, I shall take the liberty to insert another method, which is often practised to obtain this fruit early in the spring, though it doth not so properly come under this article; which is, to train up the plants either in pots or borders, after the manner before directed, for at least one year or more; then, about the beginning of *February*, there should be a moderate hot-bed prepared, in length proportionable to the number of plants designed to be forced, and the breadth should be proportionable to the width of the frames which are designed to cover them. These frames may be such as are used for common hot-beds, to raise early Cucumbers, &c. This hot-bed must be covered with fresh loamy earth about eight inches thick, into which the Strawberry plants should be placed, with large balls of earth to the roots, as close as they can conveniently be planted (for as they must be kept clear from runners, they will not spread much during the time they remain in the bed, which will be no longer than until their fruit is gone). Then they should be gently watered to settle the earth to their roots, which must be frequently repeated as the earth becomes dry, otherwise they will produce but few fruit. While the nights continue cold, the glasses of the hot-bed should be covered with mats, to preserve a kindly warmth in the beds; but in the day-time, when the weather is favourable, the glasses should be raised to admit fresh air to the plants; for if they are too much drawn (especially when they begin to flower), they will not produce much fruit. If the season should continue long cold, and the heat of the beds should decline, it will be proper to lay some fresh hot dung round the sides of the beds to renew their heat, being always careful not to make them too hot, for that will scorch their roots, and prevent their fruiting. If the plants which are planted in these beds are strong, and in a good condition for bearing, and care is taken in transplanting of them to preserve good balls of earth to their roots, as also to keep a due temperature of warmth in the beds; they will produce ripe fruit by the end of *April*, or the beginning of *May*, in plenty, and will continue bearing until some of those in the open air come in to succeed them.

The best kind of Strawberries to plant for forcing, is the Scarlet, for the Hautboys grow too rampant for this purpose.

But to return to the subject of hot walls; what I have here inserted concerning the forcing of fruits, has been only to obtain these fruits earlier in the season, than they would naturally ripen against common walls. But in some parts of *England*, where most of our good kinds of fruit seldom ripen, it might be very well worth while to build some of these walls, to obtain good fruit from the best kinds of Peaches, Plums, &c. especially in such places where fuel is plenty, because there the expence will not be great after the first building of the walls. For I would not propose to have coverings of glass, excepting for a small proportion of the walls; the rest may have frames of canvas, to shut over them, in the same manner as the glasses are contrived, which will succeed very well, where proper care is taken;

for as there will not be occasion to cover these trees until the beginning of *March*, at which time also the fires must be made, so, before the trees are in flower, the weather may be frequently warm enough to open the covers to admit sun and air to the trees in the middle of the day; for if these covers are kept too closely shut, the shoots of the trees will draw very weak, and their leaves will turn pale, for want of light and air. And as the design of these contrivances is only to bring the trees into flower three, or, at most, four weeks earlier than they would naturally come against common walls, there will be no necessity of making very large fires, or keeping the covers too closely over the trees.

Instead of canvas for these covers, oiled papers may be used, which should be done in the manner directed for raising of Melons, by passing as many sheets of paper together, as will fit the frames on which they are to be fixed; and when the paste is dry, the paper should be fastened into the frames, and then the oil rubbed over on the outside with a brush, which will soak through the paper, and when the paper is dry, the cover may be used. This paper will last very well one season, and the expence of repairing it will not be very great; wherefore these are to be preferred to the canvas, because all sorts of plants will thrive much better under them than they will under canvas, or any other close covering, which will not admit the rays of light so well through to the plants.

The frames designed for either canvas or paper may be made much slighter than those for glass, because these being very light, will not require so much strength to support them; and if these are well painted, and every year, when their use is over, carried into shelter, they will last a long time, for they will not be wanted abroad longer than three or four months, *viz.* from the beginning of *March* to the middle of *June*; for after this time the fruit will not require any covering, the trees being then full of leaves, and the young shoots will by that time have made such progress, as to become a good defence for the fruit; but these covers should not be too suddenly taken away, but by degrees the trees should be inured to the open air, otherwise the change will be too great, and may occasion most of the fruit to fall off, especially if cold nights should follow.

By this method gentlemen may be supplied with most of the best kinds of fruit, in the northern parts of *England*, where, without some such care, they cannot expect much good fruit in their gardens. And as coal is in great plenty in those places, the expence will be very little; therefore I am surpris'd that most of the gentlemen, who live in the north, do not put this method in practice. That there are some of these walls built in the north is well known, but then they are chiefly designed to produce a little early fruit, more for curiosity than any real use; and these walls are, for the most part, so ill contrived, that four times the fuel is expended, as will be requisite when the walls are built after the manner here directed; and where the heat is not pretty equally distributed through every part of the wall, some of the trees will have too much heat, while others will have little benefit from the fires.

Where the walls are planted with the best kinds of fruit, which are designed to ripen in perfection, if the autumns should prove cold, or very wet, before the fruit be ripe, it will be proper to put the covers over the trees; and if there are some slow fires made to dry off the damp, it will be of great use to prevent the fruit from growing mouldy, and to hasten their ripening; but when this is practis'd, the covers should be taken off whenever the weather will admit of it, that the fruit may enjoy the benefit of the free air, without which they will be insipid or ill-tasted.

Although in the former directions for forcing trees, in order to have early fruit, I have advised, that such trees should have one or two years rest, in order to recover vigour; yet that is not to be understood of these trees, which are only designed to be brought forward enough to produce their fruit in perfection; for as the fires are not designed to be made till the beginning of *March*, the trees will not be weakened thereby, because they will be inured to the open air long before their fruit is ripe, and will have time to ripen their shoots, and form their buds, for the next year's bearing; therefore these trees may be thus forced every year, without doing them much injury, provided they are carefully managed.

There are some persons near *London* who make it their business to raise early fruit to supply the markets, which they perform by the heat of dung only, having no fire-walls in their gardens. The method which these people follow is to have a good quantity of new dung laid in a heap to warm (after the same manner as is practised for making of hot-beds). When this dung is in a proper temperature of heat, they lay it close on the backside of their fruit-wall, about four feet thick at the bottom, and sloping to about ten inches or a foot thick at the top. This dung should be gently beat down with a fork to prevent the heat going off too soon; but it should not be trodden down too hard, lest that should prevent its heating. The outside of the dung should be laid as smooth as possible, that the wet may run off more easily; and if there is a covering of thatch, as is sometimes practised, it preserves the dung from rotting too soon, whereby the heat is continued the longer. The time for laying this dung to the back of the wall, is the same as for making the fires, *i. e.* about the middle or end of *February*. The first parcel of dung will continue warm about a month or five weeks, when there should be a supply of new dung prepared, and the old taken quite away, or mixed up with this new dung, to renew the heat, which, if it works kindly, will be sufficient to last the season. These walls are covered with glasses or oiled paper, in the same manner as the fire-walls, and the trees must be treated the same way; but there must be more care taken to open the glasses against these walls, whenever the weather will permit, otherwise the steam of the dung will occasion a great dampness through the wall, which, if pent in about the trees, will be very pernicious to them, especially at the time they are in flower.

By this method some gardeners have forced long walls, filled with old well-grown fruit-trees, which have produced great quantities of fruit annually, which has well answered their expence; but, as in many parts of *England*, it will be very difficult to procure a sufficient quantity of new dung for this purpose, the fire-walls are most useful, and least expensive.

WALL FLOWER. See *Cheiranthus*.

WALNUT. See *Juglans*.

WALTHERIA. *Lin. Gen. Plant.* 741.

The Characters are,

The flower has a cup-shaped permanent empalement of one leaf, cut into five points at the brim; it has five heart-shaped petals and five stamina, joined in a cylinder, terminated by loose summits, and an oval germen, supporting a single style, crowned by a bifid stigma. The germen turns to an oval capsule with one cell, inclosing one obtuse seed.

The Species are,

1. WALTHERIA *foliis oblongo-ovatis serratis, floribus confertis, pedunculis longissimis axillaribus*. Waltheria with oblong, oval, sawed leaves, and flowers growing in clusters upon very long foot-stalks, at the wings of the branches.

2. WALTHERIA *foliis ovatis serratis nervosis, floribus confertis alaribus sessilibus*. Waltheria with oval, sawed, veined

leaves, and clustered flowers sitting close at the wings of the stalk.

The first sort grows naturally in both *Indies*; this rises with a shrubby branching stalk to the height of eight or ten feet, covered with soft hairs. The leaves are placed alternately upon long foot-stalks; they are hairy and soft, having several longitudinal veins. From the wings of the branches arise the foot-stalks, terminated by clusters of very small yellow flowers, which just peep out of their hairy soft empalements; under each cluster is placed a small leaf of the same shape with those below. The flowers are succeeded by a single seed, wrapped in the empalement of the flower.

The second sort grows naturally at *Campeachy*, from whence the seeds were sent me. The stalks of this are ligneous; they rise six or seven feet high, dividing into several branches, which are less hairy than those of the former sort. The leaves are oval, of a yellowish green colour, sawed on their edges, and hairy, but are not so soft as those of the former, having many veins running from the midrib, standing upon long foot-stalks. The flowers are very small, yellow, and are collected into round clusters, having very short foot-stalks close to the wings of the leaves.

These plants are propagated by seeds, which must be sown on a hot-bed; and when the plants are fit to transplant, they must be each planted into a separate small pot, and plunged into a fresh hot-bed, and afterward treated in the same manner as other tender plants from the same country, so must be kept in the bark-stove, otherwise they will not thrive in *England*. The second year the plants will flower, and produce good seeds; but they may be continued three or four years, if the plants are often shifted, and their roots pared, to keep them within compass; for if they are permitted to remain long undisturbed in the tan-bed, their roots will run out through the holes in the bottom of the pots, and extend to a great distance in the tan-bed; and when this happens, if their roots are torn, or cut off, the plants seldom survive it. When the plants root into the tan, they grow very luxuriant, and cannot be kept within reasonable compass; but on their roots being disturbed, their branches will hang, and their leaves shrivel up, and drop off; therefore, to keep these plants within bounds, they should be drawn up out of the tan, at least once in six weeks, during the summer season, and the plants shifted out of the pots once in three months; with this management the last sort may be continued several years, but the first seldom lives longer than two years.

WARNERIA. Yellow Root.

The Characters are,

The flower has no empalement; it has three roundish petals, which fall off very soon, and a great number of awl-shaped stamina, terminated by oval summits, with several roundish germen, supporting a short style, crowned by a permanent bifid stigma. The germen afterward turns to a roundish fruit, composed of many acini like the Strawberry, each having one cell, including a single seed.

I have given the title of *Warneria* to this genus in honour to *Richard Warner, Esq.* of *Woodford* in *Essex*, who is a very curious botanist, and is possessed of a large collection of curious plants, of which he is very communicative to all lovers of plants. This title of the plant was given by me to it long before *Dr. Linnæus's* second volume of his *Systema Naturæ* was published, in which he has given to this plant the title of *Hydrastis*; the characters of which were sent him from *England*, but he had not seen the plant.

It grows naturally in *Persyvania*, from whence the roots were sent me by *Dr. Bensef*. The root is fleshy, of an irregular form, and a deep yellow colour, sending out one or two stalks about ten inches high; toward the bottom of these is one large, roundish, indented leaf, standing upon a

foot-stalk; the upper part of each stalk is garnished by a smaller leaf, of the same form as the lower, which embraces the stalk, which is terminated by single white flowers, composed of three petals, which drop off in a few hours after they expand, leaving a great number of stamina with the styles naked. The germen soon after swell, and compose a fruit very like that of the Dewberry, having many acini of a bright red colour when ripe, each acini including one seed.

This plant may be propagated by seeds, which should be sown in a pot of loamy earth soon after they are ripe, placing the pot in shade till autumn; when it may be put under a frame for the winter, the plants will appear in the spring; then should be placed in shade till their leaves decay, when the roots may be transplanted in a shady border, where they may remain to flower.

WATER is one of the most considerable requisites belonging to a garden: if a garden be without it, it brings a certain mortality upon whatsoever is planted. By waterings the great droughts in summer are allayed, which would infallibly burn up most plants, had we not the help of water to qualify the excessive heats; besides, as to noble seats, the beauty that water will add, in making *Jet d'Eau*, and cascades, which are some of the noblest ornaments of a garden.

The qualities of water.

Sir *Isaac Newton* defines water (when pure) to be a very fluid salt, volatile, and void of all savour and taste, and it seems to consist of small, hard, porous, spherical particles of equal diameters, and equal specific gravities; and also that there are between them spaces so large, and ranged in such a manner, as to be pervious on all sides.

Their smoothness accounts for their sliding easily over the surfaces of one another.

Their sphericity keeps them from touching one another in more points than one, and by both these their frictions, in sliding over one another, are rendered the least possible.

The hardness of them accounts for the incompressibility of water, when it is free from the intermixture of air.

The porosity of water is so very great, that there is at least forty times as much space as matter in it, for water is nineteen times specifically lighter than gold, and of consequence rarer in the same proportion, but gold will, by pressure, let water pass through its pores, and therefore may be supposed to have (at least) more pores than solid parts.

Dr. *Boerhaave* is of opinion, that if water could be had alone and pure, it would have all the requisites of an element, and be as simple as fire; but there has been no expedient hitherto found out for making it such.

Rain water, which seems to be the purest of all those we know of, is replete with infinite exhalations of all kinds, which it imbibes from the air; so that though it be filtered and distilled ever so often, yet there still remain fæces.

The purest of all waters we can any way arrive at, is that distilled from snow, gathered in a clear, still, pinching night, in some very high place, taking none but the outer, or superficial part thereof. By a number of repeated distillations thereof, the greatest part of the earth, and other fæces, may be separated from it; and this is what we must be content to call pure water.

Of the fluidity of water.

Water, says Dr. *Boerhaave*, is fluid, but the fluidity is not natural thereto; for naturally it is of the crystalline kind, and accordingly, wherever a certain degree of fire is wanting, there we see water become ice. That this ice is the proper effect of the want of heat, and not of any ad-

ditional spicula introduced into the water, as *Mariotte* and others contend, is evident enough, were it only hence, that on this supposition it could not penetrate the substance of all bodies, as we find it does, and even that of metals.

This water, in its state of solution, never remains at rest; its parts are in perpetual motion, as was first discovered by the *French* with the help of microscopes; and is farther confirmed by this, that if a little saffron be suspended in the middle of a vessel full of water, the saffron colour will in a little time form, as it were, a kind of atmosphere around, and at length be diffused through the whole water. Now this could no way be effected without a motion of the watery particles among each other. Add, that if you cast a quantity of the driest salt, in the coldest weather into water, it will soon be dissolved, which argues the continual motion of the particles of that element.

He adds, that he had more than once filled a large wide vessel with water, and narrowly watched with a good microscope, but could never perceive it without some sort of undulatory motion.

Water scarce ever continues two moments exactly of the same weight, but is always varying more or less, by reason of the air and fire contained in it. Thus, if you lay a piece of pure limpid ice in a nice balance, you will find it continue in equilibrio. The expansion of water in boiling, shews what effect the different degree of fire has on the gravity of water.

This uncertainty makes it difficult to fix the specific gravity of water, in order to settle its degree of purity; but this we may say in the general, that the purest water we can procure is, that which weighs 880 times as much as air.

However, neither have we any tolerable standard for air, for water being so much heavier than air, the more water is contained in air, the heavier of course must it be; as in effect, the principal part of the weight of the atmosphere seems to arise from the water.

Of all waters, the purest is that which falls in rain in a cold season, and a still day; and this we must be content to take for elementary water. The rain water in summer or when the atmosphere is in commotion it is certain, must contain infinite kinds of heterogeneous matter. Thus if you gather the water that falls after a thunder clap in a sultry summer's day, and let it stand and settle, you will find a real salt sticking at the bottom; but in winter, especially when it freezes, the exhalations are but few, so that the rain falls without much adulteration; and hence, what is thus gathered in the morning, is found of good use for taking away spots in the face, and that gathered from snow, against inflammations in the eye. Yet this rain-water, with all its purity, may be filtered and distilled a thousand times, and it will still leave some fæces behind it; so that to procure the purest water possible, a man must look for it in a spacious plain in the winter time, when the earth is covered with snow, and its pores locked up with frost.

The next in point of purity is spring-water. This, according to Dr. *Halley*, is collected from the air itself, which, being saturated with water, and coming to be condensed by the evening's cold, is driven against the cold tops of mountains, where, being farther condensed and collected, it gleets down or distills, as much as in an alembick.

Spring-water becomes the better by running, for during all its course, it is depositing what heterogeneous matters it contained; but while the river drives on its waters in an uninterrupted stream, all its salts, with all the vegetable and animal matters drained into it, either from exhalations, or from the ground it washes gradually, either sink to the bottom, or are driven to the shore.

But what water descends from springs on the tops of mountains, is generally pretty free from heterogeneous bodies.

Having treated of the properties of water philosophically, I shall next consider it as essentially necessary in gardens for use, as also of the beauty which water adds to gardens, where it can be obtained in plenty, if it is properly disposed; and first of its use.

In the kitchen-garden water is absolutely necessary, for without it there can be little expected; therefore in such places where there cannot be a supply of water obtained for basons or ponds, wells must be dug; and where the depth to the water is too great to be raised by pumps, there must be either machines for raising it contrived, or it must be drawn by hand; but in such places which are so unhappily situated, as to require machines for the raising of water from a great depth, there is but small encouragement to make kitchen-gardens, because the constant supplying of water in those dry situations, will be attended with great expence; and generally the produce of such land is of little worth, especially in dry seasons.

Where kitchen-gardens are supplied with water from wells, there should be a contrivance of large cisterns, into which the water should be raised, to be exposed to the sun and air some time before it is used; for the rawness of this water, when fresh drawn from wells, is not agreeable to the growth of vegetables; so that where large ponds are in the neighbourhood of these gardens, from whence the water can be led into them, that is by much the best for the growth of vegetables; next to this, river-water is to be preferred, especially from those rivers which run through or near large towns, where the water is fattened by the soil thrown into the rivers; but the water of some very clear rivers is as hard as that from the deepest springs, rising through gravel or sand; but the springs issuing through chalk, are generally much softer.

If good water can be obtained in plenty from the neighbourhood of the kitchen-garden, then there should be two or three basons made in different parts of the garden; so that no part of the garden should be too far distant from the water, for where the water is to be carried to a considerable distance, the expence of labour will be great, and there will be great danger of the plants suffering from their being but sparingly watered, labourers being very apt to flight their work, when attended with trouble, if they are not well looked after. The size of these basons should be in proportion to the quantity of water which will be required, or that they can be supplied with; but their depth should not be more than four feet, for when they are deeper, there is danger of persons being drowned, if by accident they should fall into them; besides water, when very deep, is not so well warmed and tempered by the sun and air as when it is shallow; therefore the water of shallow basons is best for the use of gardens.

In making of these basons, there must be particular regard had to the natural soil of the garden, for in loose sandy land there will require much care in making of the clay-walls so as to hold water; but where the ground is loamy, or inclining to clay, there will be little difficulty in making basons, and the clay-walls need not be so thick. Where the ground is loose, the clay-walls at the bottom should not be less than two feet thick, and those on the sides one foot and a half. The clay should be well wrought over and trod after it is taken from the pit, before it is used in building the wall. The true sign of good clay is, that it be close and firm, without any mixture of sand, and that it be tenacious and fat in handling; as for the colour, it is no matter whether it be green, yellow, blue, or red; but before the clay is brought to the place, the bason should be dug

out and formed, for if the clay is too long exposed to the sun and air, it will not be so fit for use, especially if it be laid in small parcels.

The best time of the year for making basons is in autumn, when the sun is declining, and the weather temperate; for in the spring of the year the east and north-east winds generally blow, which are drying; so that the clay-walls, which are not very carefully covered as fast as they are made, very often crack in many places, and these small cracks often grow wider, and the water will find a passage through them. The same inconveniency happens from the violent heat of the sun in summer; for when the clay dries fast, it will be very difficult (not to say impossible) to prevent its cracking, and these will let off the water; and if the clay-wall should not be well made at first, it will be very difficult to mend it after, besides the uncertainty there is in finding out the places through which the water finds a passage, which is seldom done without strictly examining every part of the clay.

When the ground is dug out level, where the bason is designed, the clay must be brought in, and laid very carefully in the bottom, being very careful that no dirt, or small stones, be mixed with the clay; and there must be some water thrown from time to time upon it, as it is closely trod by mens naked feet, and then it must be rammed very close: in the performance of this, there must be great care taken that every part of the clay is equally kneaded and rammed, without which there will be great danger of the water making its way through those parts of the clay which are not well wrought. After the bottom is finished with clay, there should be a stratum of coarse gravel laid over it about four or five inches thick, which will greatly secure the clay-wall, and render the water clear; but where the basons are large, so that the clay walls are long in making, the clay should be covered with moist litter, to prevent its drying, which may be taken off when the whole is finished, to lay on the gravel; but if part of the side-walls are finished before this is done, it will be the better, because there may be some water let into the bason as soon as the gravel is laid, which will prevent the clay from cracking; then the walls round the side of the bason must be carried up with the same care as hath been directed for the bottom, observing also to cover the clay first with litter while the work is carrying on, and afterward lay it with coarse gravel; and as the walls are finished round, the water may be let in, to secure the clay from drying or cracking.

When the whole is finished, the upper part of the walls must be laid with turf, which will secure them from being broken, and prevent the sun from penetrating the clay; but before this is done, there must be a stratum of sand laid upon the clay four or five inches thick, and upon this a thin stratum of good earth laid, for the Grass to take root in. The bed of sand will prevent the Grass from rooting into the clay; and this will also keep out the frost, which will penetrate the clay, where there is not a covering of sand to secure it, and by being frozen and swelled, and afterward drying, the clay is very apt to crack in many places. The turf on the side of the bason should be laid as far down as the water is apt to shrink, that no part of the clay may be wholly exposed to the weather, for the reasons before given.

Where these basons are made, there should be no trees growing near, for the roots of trees or shrubs will extend themselves to the clay-walls, and by penetrating them, will occasion fissures, through which the water will find an easy passage; and where tall trees are growing near basons or ponds, the shaking of the trees with violent winds is apt to loosen the clay-walls, and occasion cracks in them, therefore these cautions are necessary to be observed.

In some countries, where clay cannot be easily procured, the walls of these basons are frequently made of chalk, which is beaten into fine powder, and made into a sort of mortar; and with this the walls are made, by ramming and working it very hard and firm. These basons hold water very well where they can be well supplied with water, so as not to be too long dry, for when it so happens, the sun and wind dry the chalk, and cause it to crack, and these cracks commonly extend through the thickness of the walls, so as to let off the water.

There are others who build their walls with brick laid in terrass, which is a good method for such places where the ground is very loose and sandy, because the walls, when well built, will support the loose earth from falling or settling away from the sides; but where terrass is used, the walls should not be long dry and exposed, for the heat is apt to crack the terrass.

Some persons make a cement of powdered tile and lime, two thirds of the former to one third of the latter, being very careful in the mixing of it not to add too much water, but to labour it well in the beating, which is a principal thing to be observed. With this cement they cover the surface of the walls of basons about two inches thick, laying the plaster very smooth, and being very careful that no sticks, straws, or stones, are mixed with it; this plastering is commonly performed in dry weather, and as soon as it is finished, it is rubbed over with oil or bullocks blood, and the water let into the bason as soon as possible. This cement has the property of hardening under water, so as to be equal to stone, and will continue as long sound.

Whatever the materials are with which the walls are made, there must be great care taken that they are built so strong, as that they may resist the weight of the water; so that where the ground about the bason is not very solid, the walls should be thicker, and supported on the backside by buttresses of the same materials, placed at proper distances; or if the walls are made of clay, there should be planks supported by strong timbers, placed at proper distances to support the clay, otherwise there will be great danger of their being broken down, especially where the basons are large, so as that the winds have room to act upon the surface of the water, and drive it in large waves against the banks.

The directions here given are only for basons or reservoirs of water for use, so must not be supposed for large pieces of water for beauty; for where the ground is of a loose sandy nature, so as not to hold water, the expence of claying the bottom and sides will be too great, if the water is of a large extent; therefore it would be imprudent to attempt it in such places, but where there is a supply of water, and the ground is well adapted to hold it. There can be no greater beauty than that which water affords to a seat, provided it is properly disposed; therefore I shall give some general hints, by which persons may be directed in the forming of large pieces of water, so as to render them beautiful.

In those places where there is a command of running water, it will be a great additional beauty, because the water will always be much clearer, so more beautiful than still water; besides, if it moves with any degree of velocity, there may be one or more falls of water contrived, which will still add to the beauty. In the conducting of this water, the level of the ground must be carefully taken, for the great skill in the contriving of rivers, or other pieces of water, is in the saving of expence in the digging; therefore where the ground is naturally low, the water should be conducted through these low parts, and never endeavour to carry it through higher ground; for in such places the banks will be so high as to shut out the sight of the water,

to persons who stand at a little distance from it on either side, unless the water is very broad; and where it is so, the eye is thrown to a considerable distance over the surface of the water, by the steepness of the banks, therefore the slopes on the side of water should always be made as easy as possible; nor should they be made flat, with sharp edges on the top (as is too generally practised); for these stiff regular slopes are not near so pleasing as those which are made gently convex, for the eye will slide over these to the water, having no ridge to cut the sight, and at a small distance there will be no appearance of a cut, as will always be seen where the upper part of the slope is finished in a sharp angle; and the great skill is to contrive, that as much of the surface of the water may appear to the sight as possible.

In most of the old gardens, where there are pieces of water, there is nothing more common than to see them brought into regular figures, such as long strait canals, or basons, either round or polygonal; so that all the boundaries of the water are seen at one view, but these, however large may be their extent, are not near so pleasing as where the water is so conducted, as that the termination may be seen as little as possible; for when the water is lost from the sight by some gentle easy turns, the imagination may be led to suppose the surface of the water extended to a considerable distance; so that sometimes small pieces of water are so artfully contrived, as to make them appear very considerable.

As in the old stile of laying out gardens the water was generally wrought into regular strait canals, which corresponded with the strait walks, hedges, and regular lines of trees, which were then chiefly studied, so, as the taste altered from this stiff method of disposing gardens, to that which approached nearer to nature in the forming of rivers, or other large pieces of water, those who have succeeded best have always had great regard to the natural situation of the ground, so as to lead the water through the natural hollows, whereby the great expence of digging is saved; and by contriving to make the head in some narrow part of the ground, it may be done at a much less expence, and will be better secured than where the head is of great extent; therefore it is better either to shorten the extent of the water, or to carry it farther, according to the natural situation of the ground, than to terminate it where it may occasion great expence; and it is always observed, that where there is the greatest expence in the making of these large heads, the whole will appear less beautiful than where nature is chiefly consulted, for nothing can be more unsightly than those extensive heads which are sometimes made to pieces of water which rise six or eight feet, and sometimes much more, above the surface of the ground, whereby the water is hid from the sight, to those persons who are situated on that side of the head, and a large bank of earth shuts up the view; and sometimes these heads are so situated, as to appear in sight of the house, or from a principal part of the gardens, which is a very great absurdity.

Since the taste has been altered in the disposition of gardens, and a more natural method has been pursued by persons of judgment, there have been great improvements made in the distribution of water, so as to render it truly ornamental to the seats where they are placed; but there are some, who, by pretending to imitate or copy from these works, have erred as much in making so many short unnatural turns in their water, as those before-mentioned have done by their regular strait sides; for in what is usually termed Serpentine rivers, nothing is more common than to see a small surface of water twisted in so many short turns, as that many of them appear at one view; and these windings are often made like parts of circles, with such an air of stiffness, as to render them equally disagreeable with any

any the most studied figures, to persons of good taste. Another thing is also common to these unnatural pieces of water, which is, their being made of the same width in every part, which should always be avoided, for nothing is more beautiful than to see the water extend to a large surface in some places, and to have it in others more contracted; and this may be generally done at a much less expence than the other, where the natural site of the ground is well considered, which should be done with the utmost care, before any work of this sort is begun, for want of which many persons have repented after having been at great expence.

There is also another material thing to be observed, in the situation of large pieces of water, which is, never to extend them so near to the house, as that they may annoy it, by the damp, which the vapours exhaling from the water may occasion, especially when exposed to the wind, which will at times drive the vapours toward the house, and thereby render the habitation unhealthy, and destroy the furniture; therefore it is much better to walk out to see the water, than to sacrifice the habitation for the pleasure of seeing it from the house; nor should the water be so situated, as that the surface may be level with the floor of the house, for there is generally some moisture, which will percolate through the veins of the earth, enough to occasion so much damp, as to render the lower part of the house unwholesome; and where there is a considerable damp in the foundation of a house, part of it will ascend upward, and render the apartments so, therefore great care should be had as to this.

Where persons are not so happily situated, as to have the command of a constant running water, but yet from some neighbouring reservoirs or ponds can be supplied with it, there may be some agreeable pieces of water contrived, both for use and beauty, especially where there is a large supply, for otherwise it will be better to contract the design; for nothing can be more ridiculous than that of having either ponds or rivers designed, where they cannot be supplied with water in the dry seasons, when there is the greatest want of it, both for use and pleasure.

In those places where there is a great scarcity of water, there should be large reservoirs contrived, into which the water which descends from the hills and rising grounds may be led; so that a large body of water may be collected during the rainy season, for a supply in time of drought; these reservoirs, when large, may contain as much water as may be necessary for the use of the house and gardens; but these can rarely supply water enough for beauty, therefore in such situations it should not be attempted.

As water never appears so well, as when it is situated near woods, so in the contrivance of rivers, or pieces of water, they should be so placed as to have planting near, that the contrast between the wood and water may appear as perfect as possible; and in some places, where the water can be seen through the open groves, between the stems of large trees, it will add greatly to the beauty of the place; but where the water is designed to terminate, the head should be as much concealed as possible, by close plantations of ever-green trees, which may be faced with Alders and Weeping Willows, planted close on the sides of the water, so as that their branches may hang over; and if the water is contracted, and led through these trees with a gentle winding, it may seem to run much farther, and to communicate with a larger body of water at a distance; in the contriving of which, the greatest art is to make it appear as natural as possible; for the less art there appears in these things, the longer they will please, and the more they will be esteemed by persons of good judgment.

WATSONIA.

The title of this genus is given to it in honour of my

learned friend Dr. *William Watson*, F. R. S. whose knowledge in the science of botany justly demands this tribute.

The Characters are,

The flower has a permanent spatha (or sheath) which divides into two parts almost to the bottom; it is of one petal. The tube is long, a little curved, and swells at the upper part; the rim is cut into six obtuse segments, which spread open. It has three long slender stamina, which are terminated by prostrate oblong summits, and a roundish three-cornered germen, supporting a slender style a little longer than the stamina, crowned by three bifid stigmas. The germen afterward turns to a roundish three-cornered capsule, having three cells, opening with three valves, each containing three or four roundish seeds.

This has been titled by Dr. *Trew*, *Meriana flore rubello*, before he had been acquainted with the name which I had applied to it; but he has since informed me by a letter, that as I had raised the plants from seeds, he would suppress his title, and adopt mine, who he thought had the most right to give it; and that he rather chooses to do so, because the figure he has published of it was drawn from the plant in the *Chelsea* garden.

The Species are,

1. *WATSONIA foliis ensiformibus, floribus alternis.* *Watsonia* with sword-shaped leaves, and flowers placed alternately on the stalks.

2. *WATSONIA humilis foliis ensiformibus, floribus in thyrsis dispositis.* Dwarf *Watsonia* with sword-shaped leaves, and flowers disposed in a loose spike.

These plants grow naturally at the *Cape of Good Hope*, and were raised from seeds, which were brought from thence in the *Chelsea* garden. The description of the first sort:

The root is bulbous, compressed, and shaped like a kidney, covered with a fibrous brown skin. The leaves are sword-shaped, about a foot long, and an inch broad, ending in points; the two sides have sharp edges, but the middle is thicker, and has a prominent midrib; they are of a dark green colour, and rise immediately from the root. The stalk comes out from the root between the leaves, and rises a foot and a half high. The flowers are produced from the side, standing alternately at about an inch and a half distance from each other; they have each a spatha or sheath, composed of two leaves, which are joined at their base, where they are broad, but gradually lessen to their points. Before the flowers appear, they are of the same green colour with the stalk, and are divided, a small part of their length inclosing the flower, but afterward they are split almost to the bottom, and wither before the flowers decay, becoming dry, and wrap round the seed-vessel. The tube of the flower is an inch and a half long, narrow at the base, a little curved, swelling much larger above. The rim is divided into six obtuse segments, which spread open; the flower is of a red copper colour on the outside, but of a deeper red within; it has three stamina, which are incurved, terminated by oblong summits, of a dark brown colour, fastened in the middle to the apex of the stamina, lying prostrate. At the bottom of the tube of the petal is situated an oval three-cornered germen, supporting a slender style a little longer than the stamina, crowned by three bifid reflexed stigmas. The flowers generally appear in *May*, and the seeds ripen in *July*.

The second sort is much less than the first; the leaves are shorter, and not quite so broad; the flower-stalk seldom rises above a foot high, and the flowers are ranged closer upon the stalk; they are also of a deeper red colour.

These plants are propagated by offsets from the root, in the same manner as the *Crocus* or *Gladiolus*. The time for transplanting of the roots is in *August*, soon after the stalks decay; the larger roots must be each put into a separate pot filled with light fresh earth, and may be placed in

the open air till toward the end of *October*, when the leaves will begin to appear above ground, at which time it will be proper to remove them into shelter; for as this plant is a native of a warm country, it will require to be screened from frost.

The best way of treating these roots is to plunge the pots into an old bed of tanners bark, which has lost its heat, in *October*; this bed should be covered with a frame, the glasses of which should be drawn off every day in mild weather, that they may enjoy as much free air as possible, to prevent their drawing up weak; but they must be covered in bad weather, and screened from frost. The latter end of *April*, when they begin to put out their flower-stalks, the pots should be removed to an airy glass case, where they may stand to flower; and when the flowers are decayed, they should be placed in the open air to perfect their seeds.

The offsets and small roots may be planted three or four in a pot, according to their size, and should have the same treatment as the larger roots the first year, and by that time twelvemonth they will be strong enough to flower, so should have separate pots.

WILDERNESSES, if rightly situated, artfully contrived, and judiciously planted, are very great ornaments to a fine garden, but it is rare to see these so well executed in gardens as could be wished, nor are they often judiciously situated; for they are frequently so situated as to hinder a distant prospect, or else are not judiciously planted; the latter of which is scarce ever to be found in any of our most magnificent gardens, very few of their designers ever studying the natural growth of trees, so as to place them in such manner as not to obstruct the sight to the view; I shall therefore briefly set down what has occurred to me from time to time when I have considered these parts of gardens; whereby a person will be capable to form an idea of the true beauties, which ought always to be studied in the contrivance of wildernesses.

1. Wildernesses should always be proportioned to the extent of the gardens in which they are made, that they may correspond in magnitude with the other parts of the garden, for it is very ridiculous to see a large wilderness planted with tall trees in a small spot of ground; and, on the other hand, nothing can be more absurd than to see little paltry squares, or quarters of wilderness work, in a magnificent large garden.

Wildernesses should never be placed too near the habitation, because the great quantity of moisture, which is perspired from the trees, will cause a damp unwholesome air about the house, which is often of ill consequence. Nor should they be situated so as to obstruct any distant prospect of the country, which should always be preserved wherever it can be obtained, there being nothing so agreeable to the mind as an unconfined prospect of the adjacent country; but where the sight is confined within the limits of the garden from its situation, then there is nothing so agreeable to terminate the prospect, as a beautiful scene of the various kinds of trees judiciously planted; and if it is so contrived, that the termination is planted circularly with the concave toward the sight, it will have a much better effect than if it end in straight lines or angles, which are never so agreeable to the mind; therefore those lines should be broken.

The trees should also be adapted to the size of the plantation, for it is very absurd to see tall trees planted in small squares of a little garden; and so likewise, if in large designs the plantation has only small shrubs, it will have a mean appearance.

The walks must also be proportioned to the size of the ground, and not make large walks in a small wilderness nor too many walks, though smaller, whereby the greatest part of the ground is employed in walks; nor should the

grand walks of a large wilderness be too small, both of which are equally faulty. These walks should not be entered immediately from those of the pleasure garden, but rather be led into by a small private walk, which will render it more entertaining.

The old formal method of contriving wildernesses was to divide the whole compass of ground, either into squares, angles, circles, or other figures, making the walks correspondent to them, planting the sides of the walks with hedges of Lime, Elm, Hornbeam, &c. and the quarters within were planted with various kinds of trees promiscuously without order; but this can by no means be esteemed a judicious method, because first hereby there will be a great expence in keeping the hedges of a large wilderness in good order by shearing them, which, instead of being beautiful are rather the reverse; for as these parts of a garden should, in a great measure, be designed from nature, whatever has the stiff appearance of art, does by no means correspond therewith; besides, these hedges are generally trained up so high, as to obstruct the sight from the stems of the tall trees in the quarters, which ought never to be done.

In the next place the walks are commonly made to intersect each other in angles, which also shew too formal and trite for such plantations, and are by no means comparable to such walks as have the appearance of meanders or labyrinths, where the eye cannot discover more than twenty or thirty yards in length. These should now and then lead into an open piece of grass; and if in the middle part of the wilderness there is contrived a large opening, in the center of which may be erected a dome or banquetting-house, surrounded with a green plat of grass, it will be a considerable addition to the beauty of the place.

From the sides of the walks and openings the trees should rise gradually, above each other, to the middle of the quarters, where should always be planted the largest-growing trees which should appear to view, it will have a very different effect from the common method, where the trees are planted large and small without order.

In these plantations there may be planted next the walks and openings Roses, Honeyuckles, *Spiræa frutex*, and other kinds of low flowering shrubs; which may be always kept within compass; and at the foot of them, near the sides of the walks, may be planted Primroses, Violets, Daffodils, and many other sorts of wood flowers, to appear as in a natural wood. Behind these should be planted Syringas, *Cytisuses*, *Althæa frutex*, *Mezereons*, and other flowering shrubs of a middle growth, which may be backed with other flowering shrubs of a large growth.

In small gardens, where there is not room for these magnificent wildernesses, there may be some rising clumps of ever-greens, so designed as to make the ground appear much larger than it is in reality; and if in these there are some serpentine walks well contrived, it will greatly improve the places, and deceive those who are unacquainted with the ground as to its size.

In wildernesses there is but little trouble or expence after their first planting, which is an addition to their value; the only labour required is to keep the walks free from weeds. And in the quarters, if the weeds are hoed down two or three times in a summer, it will still add to their neatness. The trees should also be pruned to cut out all dead wood, or irregular branches, where they cross each other, and just to preserve them within due bounds; and, as was before observed, if the ground be slightly dug between the trees, it will greatly promote their vigour. This being the whole labour of a wilderness, it is no wonder they are so generally esteemed, especially when we consider the pleasure they afford.

SWEET WILLIAMS. *Sea Dianthus.*

WILLOW. *See Salix.*

WILLOW, the *French.* *See Epilobium.*

WIND is defined to be the stream or current of the air, together with such vapours as the air carries along with it, or it is a sensible agitation of the air, whereby a large quantity thereof flows out of one place or region to another.

The ancients made but four winds, according to the four cardinal points, but this was quickly looked upon as too gross a division. The following age added eight more to this number, which was thought too nice a subdividing, and therefore they reduced the last number to four, taking every other or middle wind, and adding them to the old account; but our sailors, who are far beyond the ancients for their skill in navigation, have divided the horizon into thirty-two equal parts, adding twenty-eight to the four cardinal winds; a thing useful in navigation, but of no great concern in natural philosophy, unless it be to give a hint, that the wind blows from all parts of the heavens.

Of the qualities of winds.

1. *A wind that blows from the sea is always moist; in summer it is cold, in winter warm, unless the sea be frozen up.* This is well demonstrated thus: There is vapour continually rising out of all water (as appears even hence, that a quantity of water, being left a little while in an open vessel, is found sensibly diminished), but especially if it be exposed to the sun's rays, in which case the evaporation is beyond all expectation. By this means the air incumbent on the sea becomes impregnated with a deal of vapour, but the winds blowing from off the sea, sweep these vapours along with them; and consequently are always moist.

Again, water in summer, &c. conceives less heat than terrestrial bodies, exposed to the same rays of the sun; but in winter sea water is warmer than the earth, covered with frost, snow, &c. Wherefore, as the air, contiguous to any body, is found to partake of its heat and cold, the air, contiguous to sea water, will be warmer in winter and colder in summer, than that contiguous to the earth: or thus; vapours raised from water by the sun's warmth in winter, are warmer than the air they rise in, as appears from the vapours condensing, and becoming visible, almost as soon as they are got out into the air. Fresh quantities of vapours, therefore, continually warming the atmosphere over the sea, will raise its heat beyond that over the land.

Again, the sun's rays reflected from the earth into the air in summer are much more than those from the water into the air. The air therefore over the earth, warmed by the reflection of more rays than that over water, is warmer. Hence sea winds make cloudy hazy weather.

2. *Winds which blow from the Continent are always dry, in summer warm, and cold in winter; for there is much less vapour arising from the earth than from water, and therefore the air over the Continent will be impregnated with much fewer vapours: add, that the vapours or exhalations raised by a great degree of heat out of the earth, are much finer and less sensible than those from water.* The wind therefore, blowing over the Continent, carries but little vapour with it, and is therefore dry.

Our northern and southerly winds, however, which are commonly esteemed the causes of cold and warm weather, Dr. Derham observes, are really the effects of the cold or warmth of the atmosphere: hence it is, that we frequently see a warm southerly wind on a sudden changed to the north, by the fall of snow or hail; and that in a cold frosty morning we see the wind north, which afterward wheels about toward the southerly quarters, when the sun has well warmed the air, and again in the cold evening turns northerly or easterly.

Some winds are drying, others are moist; some gather clouds, others disperse them; some are warm, others cold; but their influence is not one and the same in all places, for such winds as are warm in one country are cold in another; those that are wet with us are dry with other nations, and on the contrary.

The dry winds are such as carry but a few vapours along with them, and therefore lick off the moist particles from the bodies over which they pass; and thus in *Holland* the north and east winds, with the intermediate points, are drying, because the cold northern sea yields but few vapours in comparison of those that come from warmer parts of the ocean, but the westerly winds and others are moist, because they issue from warm and vaporous parts, the western wind seldom failing to send rain.

Such winds gather clouds which blow from the quarters where the vapours arise, which, in conjunction with the vapours of our own region, fill the air; and, on the contrary, those that bring little vapour along with them, and bear away that which hangs over us, bring fair weather.

Winds are either warm or cold, as the countries are from whence they blow; and therefore when a brisk wind blows from a cold quarter, it allays the heat of summer, which is very troublesome in still weather. Thus a quick blast of a pair of bellows will put out a flame, which a gentle blowing increases; for the quick blast drives all the flame to one side, where it is stifled by the force of the incumbent air for want of aliment, but a gentle wind augments the motion of the flame every way, and makes it seize on more parts of fuel.

Now, because all the heat or cold of wind proceeds from the heat or cold of the country where it blows, therefore the same winds are cold or hot every where. Beyond the line they are just the reverse of what they are with us; their cold winds are from the south, ours from the north; and as our south winds are warm, from no other reason but because they bring us an air heated by the sun; for the very same reason the north winds are warm to our antipodes.

From what has been said, it is evident that the sun is the cause of the wind, and motion the cause of the vapours.

Of WINE S, and vinous liquors.

WINE is a brisk, agreeable, and spirituous juice, drawn from vegetable bodies, and fermented.

Dr. *Boerhaave* characterizes wine, that the first thing that it affords by distillation be a thin, fatty, inflammable, &c. fluid, called a spirit; and in this it is distinguished from another class of fermented vegetable juices, *viz.* vinegars; which, instead of such spirit, yield for the first thing an acid, unflammable matter.

In order to the making wines, it will be of great advantage to be well acquainted with the business of fermentation. This Dr. *Boerhaave* defines and explains as follows:

Fermentation is a change produced in vegetable bodies, by means of an intestine motion excited therein; the effect whereof is this, that the part which first rises from them in distillation is either a thin, fat, acrid, hot, transparent, volatile, and inflammable fluid, that will mix with water; or else a thin, acid, pellucid, less volatile, unflammable liquor, capable of extinguishing fire.

The liquor, obtained by means of fermentation, is called thin, because none appears to be thinner than the spirit of fermented vegetables; acid, because it acts almost like fire, when applied to the tongue or other parts of the body; volatile, because there appears to be no liquor that is raised with greater ease; but it is this liquor being totally inflammable, and at the same time capable of mixing with water, that ultimately distinguishes fermentation from all other operations

rations in nature; for neither putrefaction, digestion, effervescence, nor any thing of that kind, will ever afford a liquor at once possessed of those qualities.

Putrefaction, indeed, as well as fermentation, is performed by means of an intestine motion; but the former will never produce either of the liquors above described, as the effect of fermentation; that is, neither a vinous nor acetous liquor.

We see then, that there are two different effects of fermentation, the production of an inflammable spirit, and an unflammable acid; and whatever operation will afford neither of these liquors, is improperly called fermentation; which therefore can only take place in the vegetable kingdom; for all the art in the world, so far as hitherto appears, will never gain such spirits from animals or fossils; and consequently never excite an actual and real fermentation in them; for fermentation is the single operation in nature, by which such spirits can be obtained.

2. Any vegetable liquor so fermented, as to afford the inflammable spirit above-mentioned for the first thing in distillation, we call wine; but if the liquor be so fermented, as first to afford the acid unflammable one, it is called vinegar; by which we mean every thin, acid, volatile, vegetable liquor, capable of extinguishing fire. So likewise, under the name of wine, we include beer or ale, mead and metheglin, cyder, perry, all sorts of artificial wines, and whatever liquors afford spirits possessed of the properties before set down.

The like is to be understood of vinegar, which is obtainable from all the same bodies that afford wine; so that we have either the wine or vinegar of all sorts of fruits, as of Grapes, Currants, Mulberries, Cherries, &c. all sorts of grain, as Barley, Wheat, Oats, &c. all sorts of pulse, as Beans, Peas, Tares, &c. all sorts of roots, as Turneps, Carrots, Radishes, &c. and in short, of all sorts of vegetable substances, even Grass itself.

3. All the bodies capable of being changed by fermentation, either into wine or vinegar, are said to be fermentable bodies; and because such a change can only be wrought, so far as we know at present, upon vegetables, these alone are accounted fermentable.

4. Any matter; which, being mixed with a fermentable body, increases its intestine motion, or excites or forwards the fermentation, is called the ferment; and, according to the doctrine before delivered, nothing can properly be called so, but what will produce either wine or vinegar.

These fermentable bodies may be reduced to the following classes.

The first class will consist of the meally seeds, *i. e.* all the grain, which, being fully ripe and well dried, may be reduced, by grinding, to a light meal or flour, that is neither clammy nor unctuous.

The second class consists of all the pulpy summer-fruits, which, when ripe, affect the tongue with the sense of acidity and sharpness, as Apples, Pears, Grapes, Gooseberries, &c. Under this class may be ranged all manner of bulbous pulpy roots growing in the ground, if they are first deprived of their volatile, alkaline salt, which is apt to determine them to putrefaction.

The third class takes in all the juicy parts of plants, as the leaves, flowers, stalks and roots, provided they are not too oily, or too alkaline; in which cases vegetables will rather putrefy than ferment.

The fourth class contains the fresh, expressed, and native juices of all kinds of vegetables; to which may be added all the native, saline liquors that distil from wounded plants, as the tears of the Vine, the Walnut, the Birch-tree, &c.

Under the fifth class come the most perfect of all the ve-

getable juices, *viz.* those that are unctuous, condensed, and elaborated by nature herself, such as honey, manna, sugar, and all other kinds of concocted juices capable of dissolving in water.

In order to fit any of the fermentable bodies for fermentation, there are several particulars requisite:

1. Maturity; the juice of unripe berries, as of Currants or Gooseberries, for instance, will scarce be brought to ferment at all; while it is very difficult to hinder their juice, when fully ripe, from falling spontaneously into fermentation.

Thus the juice of unripe Grapes, being incapable of fermenting, is a rough, acid liquor, called verjuice, that will for several years remain in the same unactive state; but after they come to maturity, it can no sooner be pressed into the vessel than it becomes a fermentable spirituous fluid.

2. Another requisite to prepare a body for fermentation is, that it should contain only a moderate proportion of oil; for if it either exceeds in the quantity, or be entirely destitute of oil, it will never be brought to ferment at all. Thus Almonds, Fennel-seeds, &c. are always deprived of their oil before they are attempted to be fermented.

3. The bodies intended for fermentation must not be too acid or austere; as is plain from the acid juices of unripe fruit which are greatly indisposed to ferment.

4. The last thing required to fit and prepare a body to undergo fermentation is the property of dissolving in water; for want of which all acid bodies, and such woods, roots, and herbs, as are dry and hard, become unfit for this operation; for unless the parts of these bodies are dissolved, the requisite intestine motion thereof will not ensue; but without such motion fermentation cannot subsist.

Hence honey itself can never be made to ferment, whilst it retains its native, thick consistence; but, being dissolved by heat, or let down with water, it immediately enters the state of fermentation. On the other hand, so violently as the juice of Grapes affects this state, yet if, immediately after it is expressed, it be reduced, by boiling, to the consistence of a jelly, it will lie quiet and never ferment at all, unless it be again diluted and let down with water.

Ferments are of two kinds; the natural or spontaneous, and those produced by fermentation.

The spontaneous or natural ferments are,

1. All the fresh expressed juices of fully ripened fruits, which easily run into fermentation.

2. Honey, manna, sugar, and the like thick and insipidated vegetable juices, which cause a strong fermentation.

3. The ferments produced by fermentation are, the fresh flowers or yeast of any fermenting vegetable juice or liquor, as of wine, beer, &c. By flowers or yeast is to be understood that light frothy matter, which covers the surface of the fermenting liquor in the nature of a tender crust; and which, being added to any other fermentable juices, will excite a fermentation in them.

4. The fresh *feces* or lees of any fermenting liquor, as of wine, ale, beer, &c. For all fermentation divides the liquor, which is the subject of it, into three parts, *viz.* the flowers or yeast, which possess the uppermost place; the operating or fermenting fluid, which lies in the middle; and the gross and seemingly exhausted matter, which, falling to the bottom of the vessel, is known by the name of lees, sediments, feculence, or mother, that will, if raised again out of the liquor into which it was precipitated, cause it to work afresh.

Thus, when a hoghead of wine has done fermenting, and is fined down, if the vessel be any way shaken or disturbed, it will grow turbid again, and ferment anew, as vintners very well know. For as such as were the flowers in the act of fermentation, such is the mother after the action is over.

5. Acid paste, or bakers leaven, which is no more than any kind of meal brought into a close lump by means of water, after the same manner as common bread is made; for this being set in a warm place, during the space of four or five days it will first swell, then turn very acid, and at length become a ferment.

6. Those ferments which reside in, or stick to the sides of the casks that have contained fermenting liquors; for such casks will of themselves raise a fermentation in the liquors committed to them; and *Helmont* was of opinion they might be capable of doing this for ever.

Upon account of this inherent ferment it is, that old-seasoned vessels, or such as have been long employed by vintners or brewers, bear so great a price among them.

It is very remarkable, though a thing well known to brewers and vintners, that a new cask checks the fermentation of vinous liquors, and renders them weak and spiritless; for which reason they never choose to make use of such a cask before it is seasoned, as they call it, by having first contained some spirituous or fermented liquor or other; which being plentifully drank in by the wood, the original liquor comes to be deprived of a large proportion of its spirit, and more fermentable part; whence the remainder must needs taste flat and vapid.

This is certain, that even must itself will not easily ferment in a new pure vessel, but with the greatest facility, if put into one that has before contained fermenting juices; for the parts of the fermenting liquors, with which such a vessel must have been impregnated, presently rouse and determine it to action.

7. There are some ferments that appear to be heterogeneous, or which are improperly called Ferments; as the white of an egg beat into a froth, which is used when the liquor to be fermented proves too dilute or thin to sustain the operation. For in this case the fermentable parts of the fluid easily extricate themselves, and so fly off for want of something to detain and keep them in the body of the liquor; which therefore requires some viscid substance to be mixed with it, in order to prevent this avolation of its subtle parts. And this cannot be more commodiously effected, than by the white of an egg.

8. Of the like heterogeneous kind of ferments are all fixed and acid salts. Thus, if the liquor designed for fermentation be too acid to work kindly, the addition of an alkaline salt, as that of Vine branches, or any saponaceous substance, will, by taking off from the acidity, fit it for and so promote the operation; but if the liquor be of itself too alkaline, then tartar, or the like, ought to be added to it, to promote the fermentation.

But this does not happen, because either the acid or alkaline salt is an actual ferment, as some chymists have vehemently contended for the alkaline, because the salts employed respectively temper and take down the predominant acid or alkali, which before hindered the fermentation of the liquor.

And if such salts should in due quantities be mixed with any proper subject of fermentation, possessed of all the qualities before set down, as requisite to it, the operation would be entirely checked and prevented; so that alkaline bodies may as well be said to hinder as promote fermentation.

9. And lastly: Of the same sort are certain austere or rough tasted substances, as all harsh and green fruit, Pomegranate bark and flowers, the Tamarisk bark, Crab Apples, unripe Medlars, &c. which, when the liquor designed for the fermentation is too much broken in its parts, or dissolved in its texture, bind it together again by its astringent quality; so that though it was before too thin and aqueous, it is now reduced to a proper consistence for fermentation.

Thus, when must proves thin and watery, it will not fer-

ment kindly, unless some austere or astringent ingredient, as red Rose leaves, or the like, be added to it, to thicken and improve its consistence, and at the same time prevent the air it contains from making too easy an escape.

But when a liquor is too austere, or its roughness proves so great, that it cannot ferment, the addition of a fixed alkali, in a proper quantity, will remove the obstruction, and leave it at liberty to work.

So likewise when the operation is prevented by too large a proportion of acid in the liquor, the method is to throw chalk, Crabs-eyes, Bole Armoniaek, or the like, into it; but if it be too unctuous or oily, as is the case of some *Spanish* wines, salt of tartar is made choice of; and thus, as circumstances alter, different bodies are employed to stop or promote fermentation in liquors.

In order for fitting the subjects of the second class for fermentation, and making vinous liquors, *viz.* pulpy summer fruits, and the roots of bulbous plants, in case they prove crude or hard, they are to be first boiled in water, and afterwards bruised, which will dispose them for fermentation; but if such subjects are juicy, they may be directly ground to a pulp, or have their juice pressed from them; or if they are very succulent, there may be no occasion to bruise them, only directly to commit them to the press, and squeeze out all their juice.

But if the flesh or substance be strong and tough, it may be proper to rasp, shave, or cut them into small pieces, which will be of service in some bulbous roots, and make them yield their juice with the greater ease, and in greater plenty.

Prepared fruits seldom stand in need of any thing to make them ferment, for they generally begin to work of their own accord; but if the weather should prove exceeding cold, or the operation proceed but languidly, it may not be amiss to quicken it by adding a small proportion of a ferment, as a little yeast, the lees or mother of wine, or even a little new wine may serve the turn.

The subjects of the third class, *viz.* the succulent parts of plants, need only, in order to their fermentation, be beat to a thick kind of pulp, while they are fresh, and mixed with a proper proportion of rain water, that is just enough to dilute them, for if much water be employed, the spirit will be the weaker for it.

These require but very little ferment, or none at all, to make them work in the summer season, and no large proportion in the winter; but in case any at all be required, nothing will prove more serviceable than honey or sugar.

The subjects of the fourth and fifth classes, *viz.* the fresh native juices, and weeping liquors of vegetables, with the condensed and unctuous juices of the same, are to be diluted and let down with rain-water, to a due consistence, which is then thought to be obtained, when the compound liquor will just keep a new laid egg afloat; but some vegetable juices may naturally be of this very density or consistence, and in that case they will require no water at all. If any be thicker or denser, they ferment not so kindly, and if thinner or rarer, they afford but a weak spirit. Thus, in order to ferment sugar, treacle, or any common syrup, we first let down the matter with water, to the consistence above-mentioned; and then, if there be occasion, put yeast to it, to quicken the fermentation, and make it proceed kindly.

The subjects of the fourth class, *viz.* the prepared recent juices, and spontaneous tears of vegetables, are so far from requiring any ferment, that it often proves very difficult to restrain or check the fermentation they naturally fall into, especially if the season be warm and the juices rich; at most, if the weather should prove cold, they need only be set in a warm place to make them work.

The subjects of the fifth class, *viz.* the prepared or inspissated juices of vegetables, require no ferment at all in the summer, and but a small proportion in winter, to set them on working; less than an ounce of yeast to twenty pints of prepared liquor, will usually do for that purpose in the coldest season; but in hot countries, or sultry seasons, these prepared juices, and especially sugar, are of themselves apt to fall into a too violent fermentation; which therefore ought to be abated by the contrary means.

All the vegetable bodies of the several classes designed for fermentation, and prepared for it in the foregoing manner, ought, together with their ferments, to be committed to casks of oak already seasoned with the same kind of fermented liquor, or some other consisting of subtil and penetrating parts. Then those casks or vessels having their bung-holes lightly covered with a thin or single cloth, and being set in a warm place the liquor will ferment.

The mouths of the vessels are thus slightly covered over, that the air may have a free passage in and out of them, for they are here designed to serve as vent holes; and these vessels are ordered of wood, because fermentation is never observed to be so well carried on in those of glazed earth or glass, though, on account of their transparency, it is sometimes performed in the latter, that the phenomena may be better observed.

The preparatory business of fermentation hitherto described has been carried on by art, but nature must now perform the rest of the work; so that we are here only concerned to observe the phenomena which arise in the operation.

When therefore any fermentable body is prepared after the manner above delivered, and with its due proportion of a ferment committed to a large strong glass vessel standing in a warm place;

1. The whole body of the liquor soon begins to swell, heave, rarefy, and send up little bubbles to the top of the vessel, where they burst with an audible noise, and form into froth. Now the liquor which was before transparent grows opaque, and a violent uninterrupted intestine motion manifests itself therein.

2. The parts of the fermenting fluid appear incredibly elastic, and the motion of them exceeding violent. Indeed, by means of this property of fermentation, very terrifying and surprising actions may be performed. Thus if a hundred pints of musts were, on some warm day in autumn, to be confined close in a vessel of oak above an inch thick in the sides, and made ever so tight and strong with iron hoops, yet could not this prevent the working of the liquor; but in spite of so great a resistance it would burst the vessel with a report as loud as that of a cannon.

And therefore the way to preserve new wine in the state of must is to put it up in very strong, but small casks, firmly closed on all sides, by which means it will be kept from fermenting; and then it goes by the name of *stum*; but if it should happen to fall into fermentation, the readiest and only way to stop it is by the fume of sulphur, or something of the like nature.

Were it not for the knowledge of this property of burning sulphur, the wine merchants and vintners might frequently sustain great damages from the bursting of the vessels when the liquor is upon the fret, or, by some alteration in the air, or other accident, begins to ferment again; but the smoak of a little common brimstone, or a lighted match dipped in it, and held under a cask of wine that is just ready to burst its hoops, will calm its fury, and make it subside as suddenly as a spoonful of oil thrown into a large foaming copper of boiling sugar, takes down its heat, and prevents the mischief it might otherwise occasion.

3. A thick skin or crusty scurf forms itself on the sur-

face, through which the elastic or fermenting matter is continually breaking. This crust appears to be the principal cause of fermentation, for it keeps in, or prevents the spirituous part of the liquor from flying off; and if it be frequently broken, it puts a check to the fermentation, and will often entirely stop it if wholly taken away.

4. This skin or crust, which we now call flowers or yeast, gradually consumes and precipitates to the bottom of the liquor, in which case it is called by the name of *feces* or mother; and after this, the fluid above it immediately becomes transparent again, ceases to hiss and bubble, has a very penetrating, pungent, spirituous, or vinous taste and scent, with a mixture of acidity and sweetness. And now the liquor, having undergone the operation of fermentation, is become wine.

The vapour arising from the liquor during its fermentation, ought not to be approached too near, or breathed in too great a quantity, because it is highly poisonous; and if it prove not mortal, may at least render the person apoplectic and paralytic. We have accounts in the *French* and *German* transactions, of people who were immediately struck dead, by receiving at the nose the fumes that issued from large vessels of wine in the state of fermentation.

And now if the liquor thus fermented be stopped down close, it will begin to feed upon and digest its own lees and mother, and at length consume them; in which case we commonly say the wine begins to ripen, and afterwards this mother shoots to the sides of the containing vessel, and there appears in the form of an essential salt which is then called tartar.

The space of time required for finishing the fermentation differs with the subject matter, the season of the year, the nature of the place, and other circumstances; but it is known to be perfectly performed by the several phenomena just now mentioned.

As soon as the flowers fall to the bottom, the vessel should be bunged down, otherwise the volatile part would fly off, and the fermented liquor become vapid and flat.

In this state it ought to stand for some weeks in a cool place, by which means it will grow stronger and more liquid; for during this time it imbibes and consumes its own *feces*, which abound in subtle spirituous parts, and grows soft and loses of its acidity by throwing off its tartar.

And the longer it is thus suffered to stand, the more strength it gains, or the more spirit it will yield in distillation.

Thus, for instance, malt liquors newly brewed afford but a small quantity of inflammable spirit; but if suffered to remain for some weeks in the vessel, till they become fine and clean, they will yield much greater proportion; though, to avoid so great an apparatus of vessels as would then be required, malt liquors brewed, in order to make spirits, are seldom kept, but immediately after fermentation committed to the still. And hence we are furnished with a reason why all stale, vinous liquors are stronger, and inebriate sooner, than such as are new.

Some short general directions as to the making of Wines.

Wine is made of Grapes, by stamping them in a vat, or crushing and expressing the juice out of them in a press, and then fermenting, &c.

In the southern parts of *France* their method is, for red wines, to tread the Grapes, or squeeze them between their hands, and let the whole stand, juice and husks, till the tincture be in colour as they would have it, and then they press it; but for white wines they press the Grapes immediately.

When they have been pressed they tun the must and stop up the vessel, leaving the cask empty about the depth of half a foot, or better, to give room for its working.

At the end of ten days they fill this space with some other proper wine, that will not provoke it to work again, repeating this every ten days for some time: new wine spending itself a little before it is perfect.

About *Paris*, and in the northern parts of *France*, they let the marc and must stand two days and nights for white wines, and at least a week for claret wines, before they tun it, and while it continues working they keep it as warm as possible.

Some, upon stopping it up for good and all, roll the cask about the cellar to mix it with the lees, and after it has been settled a few days rack it off with great improvement.

To fine it down they put shavings of green beech into the cask; but they first take off all the rind, and boil them an hour in water to extract their rankness, and afterward dry them in the sun or an oven. A peck of these will serve for a hoghead of wine; they put it in a gentle working, and purify it in twenty-four hours; they also give it an agreeable flavour.

Some sweeten their wines with Raisins of the sun, trod in the vat with the Grapes, they having been first plumped by boiling; others by boiling half the must, scumming it, and tunning it up hot with the other.

Wine is distinguished, from the several degrees and steps of its preparation, into

1. *Mere-goute*, mother-drop, which is the virgin wine, or that which runs of itself out of the tap of the vat, before the Grapes are trodden.

2. The must, surmoult, or scum, which is the wine or liquor in the vat, after the Grapes have been trodden in the vat.

3. The pressed wine, or *Vin de Pressurage*, which is that squeezed with a press out of the Grapes half-bruised by treading.

4. *Boisson*, or draught wine. This is made of the husks left of the Grapes, which are called rape or marc, which, by throwing water upon, and pressing afresh, they make a liquor for servants.

Wines are also distinguished into

Vin doux, or sweet wine, which is that which has not yet worked nor boiled.

Bourou; that which has been prevented working by casting in cold water.

Wine of the *cuve*, or worked wine, *i. e.* that which has been let to work in the vat to give it a colour.

Vin cuit, *i. e.* boiled wine; that which has had a boiling before it worked, and which, by that means, still retains its native sweetness.

Vin passé, *i. e.* strained wine; that which is made by steeping dry Grapes in water, and letting it ferment of itself.

The goodness of wine consists in its being neat, dry, clear, fine, brisk, without any taste of the soil, of a clean steady colour; in its having a strength, without being heady; a body, without being four; and its keeping, without growing hard.

After wines have been made, they require to be managed according to their different state and circumstances. We shall therefore consider them under these four general heads following:

1. The natural purification or clarification of wines, whereby, of themselves, they pass from the state of crudity and turbulency to that of maturity, by degrees growing clear, fine, and potable.

2. The unseasonable workings, frettings, and other sicknesses, to which, from either internal or external accidents, they are afterward subject.

3. Their state of declination or decay, wherein they degenerate from their goodness and pleasantness, becoming palled or turning into vinegar.

4. The several artifices used to them in each of these states and conditions. As to the first, *viz.* the natural clarification of new wines, two things occur which deserve consideration; the manner how, and the cause by which, the same is effected.

As for the manner, it is to be observed that wine, while yet in the must, is usually put into open vessels, the abundance and force of the spirits, *i. e.* the more subtile and active parts therein contained being then so great, as not to endure being imprisoned in close ones; at which time it appears troubled, thick, and feculent, all parts of it being violently moved and agitated, so that the whole mass of the liquor seems to boil like water in a caldron over the fire.

This tumult being in some degree composed, and the *Gas sylvestre* (as *Van Helmont* calls it), or wilder spirit, sufficiently evaporated, they then pour the must into close vessels, there to be farther defecated by continuance of the same motion of fermentation, reserving the froth or flower of it, and putting the same into small casks hooped with iron, lest otherwise the force of it might break them.

This flower, thus separated, is what they call *stum*, either by transposition of the letters in the word must, or from the word *stum*, which in high *Dutch* signifies *mute*; because this liquor (as one may say) is hindered from that maturity, by which it should speak its goodness and wholesomeness.

This being done, they leave the rest of the wine to finish its own fermentation; during which it is probable, that the spirituous parts impel and diffuse the grosser and feculent parts up and down in a confused and tumultuous manner, until, all being disposed in their proper regions, the liquor becomes more pure in substance, more transparent to the eye, more piquant and gustful to the palate, more agreeable to the stomach, and more nutritive to the body.

The impurities, being thus separated from the liquor, are, upon chemical examinations, found to consist of salt, sulphur (each of which is impregnated with some spirits), and much earth, which, being now dissociated from the purest spirits, either mutually cohere, coagulate, and affix themselves to the sides of the vessels, in form of a stony crust, which is called tartar and argol, or sink to the bottom in a muddy substance, like the grounds of ale or beer, which is called the lees of wine. And this is the process of nature in the clarification of all wines, by an orderly fermentation.

As for the principal agent or efficient cause of this operation, it seems to be no other but the spirit of the wine itself; which, moving every way in the mass of the liquor, thereby dissolves that common tie of mixture, whereby all the heterogeneous parts thereof were combined and blended together; and having gotten itself free, at length abandons them to the tendency of their gravity and other properties, which, they soon obeying, each kind consorts with its like, and betaking themselves to their several places or regions, leave the liquor to the possession and government of its noblest principle, the spirit. For this spirit, as it is the life of the wine, doubtless is also the cause of its purity and vigour, in which the perfection of that life seems to consist.

From the natural fermentation of wines we pass to the accidental; from their state of soundness to that of their sickness, which is the second general head.

We have the testimony of experience, that frequently even those wines that are good and generous are invaded by unnatural and sickly commotions, or (as the wine coopers call them) workings; during which they are turbulent in motion, thick of consistence, unfavoury in taste, unwholesome in use, after which they undergo sundry alterations for the worse.

The causes of this may be either internal or external.

Among the internal, the chief place may be assigned to the excessive quantity of tartar or of lees, which contain much salt and sulphur, and continually send forth into the liquor abundance of quick and active particles, that, like stum, or other adventitious ferment, put it into a fresh tumult or confusion, which, if not in time allayed, the wine either grows rank or prickling, or else turns sour, by reason that the sulphur, being too much exalted above the rest of the elements or ingredients, predominates over the pure spirits, and infects the whole mass of liquor with sharpness or acidity; or else it comes to pass, that the spirits being spent and flown away in the commotion, the salt, dissolved and set afloat, obtains the mastery over the other similar parts, and introduceth rankness or ropiness.

Nay, if those commotions chance to be suppressed before, the wine is thereby much depraved, yet do they always leave such ill impressions, as, more or less, alienate wine from the goodness of its former state, in colour, consistence, and taste.

For hereby all wines acquire a deeper tincture, *i. e.* a thicker body or consistence, saeks and white wines changing from a clear white to a cloudy yellow; and claret losing its bright red for a dusky Orange colour, and sometimes for a tawney. In like manner they degenerate also in taste, and affect the palate with foulness, roughness, and rancidity, very unpleasant.

Among the external are commonly reckoned the too frequent or violent motion of wines after their settlement in their vessels, immoderate heat, thunder, or the report of cannon, and the admixture of any exotick body, which will not symbolize, or agree and incorporate with them; especially the flesh of vipers, which has been frequently observed to induce a very great acidity upon even the sweetest and fullest-bodied *Malaga* and *Canary* wines; or by putting new wines in a state of fermentation into vaults with old wines, in them more or less according to their different ages, but in all enough to make it turbid.

This brings us in the next place to the third previous thing considerable, *viz.* the palling or flatting of wines, and their declining towards vinegar, before they have attained to their state of maturity and perfection.

Of this the greatest and nearest cause seems to be their jejuneness and poverty of spirits, either native or adventitious:

Native, when the Grapes themselves are of a poor and hungry kind, or gathered unripe, or nipt by early frosts, or half starved in their growth by a dry and unkindly season, or too full of watery parts:

Adventitious, when the liquor, rich perhaps and generous enough at first, comes afterwards to be impoverished by loss of spirits, either by oppression, or by exhaustion.

The spirits of wine may be oppressed, when the quantity of impurities or dregs, with which they are combined, is so great, and their crudity, viscosity, and tenacity so stubborn, that they can neither overcome them, nor deliver them from their adhesion; but are forced to yield to the obstinacy of the matter on which they should operate, and so to remain unactive and clogged, as may be exemplified in the coarse wines of *Moravia*, which, by reason of their great austerity and roughness, seldom attain to a due exaltation of their spirits, but still remain turbulent, thick, and

in a state of crudity, and therefore easily pall; in which respect they are condemned by some *German* physicians as bad for generating the scurvy, and administering matter for the stone and gout, they yielding more of tartar than other wines.

The spirits of wine may be exhausted or consumed, either suddenly or gradually; suddenly, by lightening, which spoils wine, not by congelation or fixation of its spirits; for then such wines might be capable of being restored by such means as are apt to reinforce and volatilize the spirits again, contrary to what has been found by experience; but perhaps by disgregation, and putting them to flight, so as to leave the liquor dead, palled, and never to be revived by any supply.

Gradually, two ways, *viz.* by unnatural fermentation, of the ill effects of which something has already been said; or by heat from without, of which we have an instance in the making of vinegar; which commonly is done by setting the vessels of wine against the hot sun, which, beating upon the mass of liquor, and rarefying the finer parts thereof, gives wings to the fugitive spirits to fly away together with the purer and more volatile sulphur, leaving the remainder to the dominion of the salt, which soon debaseth and infecteth it with sourness.

This being the common manner of turning wine into vinegar, in all ages and all countries, it may be doubted whether spirit of wine may be drawn out of vinegar, notwithstanding it hath been delivered as practicable by *Sennertus* himself.

The times of the year when wines are observed to be most prone to ferment and fret, and then to grow qually (as it is called), that is, turbulent and foul, are *Midsummer* and *Allballowtide*, when our vintners are wont to rack them from their gross lees, especially *Rhenish*, which commonly grows sick in *June* if not racked; and they choose to do it in the wane of the moon, and fair weather, the wind being northerly.

Having thus succinctly recounted the most remarkable distempers of wines, guessed at their respective causes, and touched upon the times, it is proper to proceed to their usual remedies, such, at least, as may be collected from wine coopers and vintners; which is the fourth and last part proposed to be treated of.

To begin, therefore, with some of the artifices used to wines when yet in must: it is observable, that though to raising a fermentation in them at that time, there is not so much need of any additional ferment, as there is in the wort of ale, beer, hydromel, metheglin, and other sorts of drinks, familiar to us in *England*; because the juice of the Grape is replenished with generous spirits, sufficient of themselves to begin that work; yet it is usual in some countries to put quick lime either upon the Grapes, when they are pressing, or into the must; to the end that, by the force and quickness of its saline and fiery particles, the liquor may be both accelerated and assisted in working.

For the same reason, perhaps, it is that the *Spaniards* mix with their wines, while they are yet flowing from the press, a certain thing they call *gieffo*, which probably is a kind of gypsum or plaster, whereby the wines are made more durable, of a paler colour, and pleasanter taste; others put into the cask shavings of Fir, Oak, or Beech, for the same purpose.

Again; though the first fermentation succeeds generally well, so that the whole mass of liquor is thereby delivered from the gross lee; yet sometimes it happens either through scarcity of spirits at first, or through immoderate cold, that some part of those impurities remain confused and floating therein.

Now, in this case, wine-coopers put into the wine certain things to hasten and help its clarification; such as, being of gross and viscous parts, may adhere to the floating lee, and, sinking, carry it with them to the bottom; of which sort are iinglass and the whites of eggs, or such as, meeting with the grosser and earthly particles of the lee, disassociate and sink them by their gravity; of which kind are the powders of alabaster, calcined flints, white marble, roach allum, &c.

The *Grecians*, at this day, have a peculiar way of spurring nature, in fining and ripening their strongest and most generous wines; and this is done by adding to them, when they begin to work, a proportionate quantity of sulphur and allum; not (as is very probable) to prevent their fuming up to the head, and inebriating, according to the conjecture of that great man the lord of *St. Alban's*, for notwithstanding this mixture, they cause drunkenness as soon, if not sooner, than other wines; nor are men intoxicated by the vapours of wine flying up immediately from the stomach into the brain, but only to excite and promote fermentation, and hasten their clarification that ensues thereupon; the sulphur, perhaps, helping to attenuate and divide those gross and viscid parts, wherewith *Greek* wine abounds, and the allum conducting to the speedier precipitation of them afterwards. And a learned traveller relates, that some merchants put into every pipe of their *Greek* wine a gill, or thereabouts, of the chemical oil of sulphur, in order to preserve it the longer clear and sound; which, though it is very probable, because the sulphur is known to resist putrefaction in liquors, yet one would decline the use of wines so preserved, unless in time of pestilential infection.

But of all ways of the hastening the clarification and ripening of wine, none seems to be more easy, or less noxious, than that borrowed from one of the ancients by the lord chancellor *Bacon*; which is, by putting the wine into vessels well stopp'd, and letting it down into the sea.

That this practice was very ancient is manifest from that discourse of *Plutarch*, *Quest. Natur.* 27. about the efficacy of cold upon must; whereof he gives this reason, that cold, not suffering the must to ferment, by suppressing the activity of the spirits therein contained, conserveth the sweetness thereof a long time; which is not improbable, because experience teaches, that such as make their vintage in a rainy season cannot get their must to ferment well in a vault, unless they cause great fires to be made near the casks; the rain mixed with the must, together with the ambient cold, hindering the motion of fermentation, which arises chiefly from heat.

That the same is frequent at this day also, may be collected from what *Mr. Boyle* has observed in his *History of Cold*, on the relation of a *Frenchman*, viz. that the way to keep wine long in the must (in which the sweetness makes many to desire it) is to tun it up immediately from the press, and, before it begins to work, to let down the vessels, closely and firmly stopp'd, into a well or deep river, there to remain for six or eight weeks; during which time the liquor will be so confirmed in its state of crudity as to retain the same, together with its sweetness, for many months after, without any sensible fermentation.

But it may be objected, how can these two so different effects, the clarification of new wine, and the conservation of wine in the must, be derived from one and the same cause, the cold of the water?

But this may be conceived without much difficulty; for it seems not unreasonable, that the same cold which hinders must from fermenting, should yet accelerate and promote the clarification of wine after fermentation; in the first, by giving a check to the spirit, before it begins to move and act upon the crude mass of liquor, so that it can-

not in a long time after recover strength enough to work; in the latter, by keeping in the pure and genuine spirit, otherwise apt to exhale, and rendering the flying lee more prone to subside, and so making the wine much sooner clear, fine, and potable. Thus much concerning the helps of new wine.

The general and principal remedy for the preternatural or sickly commotions incident to wines after their first clarification, and tending to their impoverishment or decay, is racking, i. e. drawing them from their lees into fresh vessels.

Which yet being sometimes insufficient to preserve them, vintners find it necessary to pour into them a large quantity of new milk, as well to blunt the sharpness of the sulphureous parts now set afloat and exalted, as to precipitate them and other impurities to the bottom by adhesion.

But, taught by experience, that by this means the genuine spirits of the wine also are much flatted and impaired (for the lee, though it makes the liquor turbid, doth yet keep the wine in heart and conduce to its duration); therefore lest such wines should pall and die upon their hands, as of necessity they must, they draw them for sale as fast as they can vend them.

For the same disease they have divers other remedies, particularly accommodated to the nature of the wine that needs them: to instance a few;

For *Spanish* wines disturbed by a flying lee they have this receipt: Make a parell (as they call it) of the whites of eggs, bay salt, milk, and conduit water; beat them well together in a convenient vessel, then pour them into a pipe of wine (having first drawn out a gallon or two to make room), and blow off the froth very clean; hereby the tumult will in two or three days be compos'd, the liquor refined and drink pleasantly, but will not continue to do so long; and therefore they advise to rack it from the milky bottom after a week's settlement, lest otherwise it should drink foul and change colour.

If sacks or *Canary* wines chance to boil over, draw off four or five gallons; then putting into the wine two gallons of milk, from which the cream hath been skimmed, beat them till they are thoroughly mixed together, and add a pennyworth of roach allum, dried in a fire shovel and powdered, and as much of white starch; after this take the whites of eight or ten eggs, a handful of bay salt, and having beaten them together in a tray put them also into the wine, filling up the pipe again, and letting the wine stand two or three days, in which time the wine will recover to be fine and bright to the eye, and quick to the taste; but you must be sure to draw it off that bottom very soon, and spend it as fast as you can.

For claret, in like manner diltemper'd with a flying lee, they make use of this artifice:

They take two pounds of the powder of pebble-stones baked in an oven, the whites of ten or twelve eggs, a handful of bay salt, and having beaten them well together, in two gallons of the wine, they mix them with that in the cask, and after two or three days draw off the wine from the bottom.

The same parell serves also for white wines upon the fret, by the turbulency and rising of their lee.

To cure *Rhenish* of its fretting (to which it is most prone a little after *Midsummer*, as was before observed), they seldom use any other art but giving it vent, and covering the oaken bung with a tile or slate, from which they carefully wipe off the filth purged from the wine by exhalations; and after the commotion is by this means compos'd, and much of the fretting matter cast forth, they let it remain quiet for a fortnight, or thereabouts, and then rack it into a fresh cask, newly fumed with a sulphurated match.

As for the various accidents that frequently ensue and vitiate wine (after those before-mentioned reboilings, notwithstanding their suppression before they were incurable); you may remember they have all been referred to such as alter and deprave wines, either in colour or consistence, or taste or smell. Now for each of these maladies our vintners are provided of a cure.

To restore *Spanish* and *Austrian* wines grown yellow or brownish, they add to them sometimes milk alone, and sometimes milk, and isinglass well dissolved therein; sometimes milk and white starch; by which they force the exalted sulphur to separate from the liquor, and sink to the bottom, so reducing the wine to its former clearness and whiteness.

The same effect they produce with a composition of Iris-roots and salt-petre, of each four or five ounces, the whites of eight or ten eggs, and a competent quantity of common salt, mixed and beaten in the wine.

To amend claret decayed in colour, first they rack it upon a fresh lee, either of *Alicant* or red *Bordeaux* wine; then they take three pounds of Turnsole, and steep it all night in two or three gallons of the same wine, and having strained the infusion through a bag, they pour the tincture into a hoghead (sometimes they suffer it first to fine itself in a rundlet) and then cover the bung-hole with a tile, and so let it stand for two or three days, in which time the wine usually becomes well-coloured and bright.

Some use only the tincture of Turnsole.

Others take half a bushel of full ripe Elder-berries, pick them from their stalks, bruise them, and put the strained juice into a hoghead of discoloured claret, and so make it drink brisk, and appear bright.

Others, if the claret be otherwise sound, and the lee good, overdraw three or four gallons; then replenish the vessel with as much good red wine, and roll it upon its bed, leaving it reversed all night; and then next morning they turn it again, so as the bung hole may be uppermost; which stopped, they leave the wine to fine.

But in all these cases they observe to set such newly recovered wines abroad the very next day after they are fined, and to draw them for sale speedily.

To correct wines faulty in consistence, *i. e.* such as are lumpish, foul, or ropy;

They generally make use of the powders of burnt allum, lime-chalk plaster, *Spanish* white, calcined marble, bay salt, and other the like bodies, which cause a precipitation of the gross and viscid parts of the wine then afloat: as for example;

For attenuation of *Spanish* wines that are foul and lumpish, having first racked them into a newly scented cask, they make a parell of burnt allum, bay salt, and conduit water; then they add to these a quart of Bean-flower, or powder of Rice; and if the wine be brown and dusky, milk, otherwise not; and beating all these well together with the wine, blow off the froth, and cover the bung with a clean tile or stone. Lastly, they rack the wine again after a few days, and put it into a cask well scented.

The manner of scenting casks is as follows:

They take four ounces of brimstone, one ounce of burnt allum, and two ounces of aqua vitæ; these may be put together in an earthen pan or pipkin, and hold them over a chafing dish of glowing coals, till the brimstone is melted and runs; then they dip therein a little piece of new canvass, and instantly sprinkle thereon the powders of Nutmegs, Cloves, Coriander, and Anise-seeds. This canvass they fire, and let it burn out in the bung-hole, so as the fume may be received into the vessel; and this is said to be the best scent for all wines.

To prevent the foulness and ropiness of wines, the old *Romans* used to mix sea-water with their must.

To cure the ropiness of claret, the vintners, as well *French* as *English*, have many remedies; of which these that follow are the most usual:

First they give the wine the parell, then draw it from the lee, after the clarification by that parell; this done, they infuse two pounds of Turnsole in good sack all night; and the next day, putting the strained infusion into a hoghead of wine with a spring funnel, leave it to fine, and after draw it for excellent wine.

Another is this: they make a lee of the ashes of Vine branches, or of oaken leaves, and pour it into the wine hot, and after stirring leave it to settle; the quantity of a quart of lee to a pipe of wine.

A third is only a spirit of wine, which, put into a muddy claret, serves to the refining it effectually and speedily; the proportion being a pint of spirit to a hoghead; but this is not to be used in sharp and eager wines.

When white wines grow foul and tawny, they only rack them on a fresh lee, and give them time to fine.

For the mending of wines that offend in taste, vintners have few other correctives, but what conduce to clarification; nor do they indeed much need variety in the case, seeing all unfavouriness of wines whatever proceeds from their impurities set afloat, and the dominion of others, their sulphureous or saline parts, over the finer and sweeter; which causes are removed chiefly by precipitation.

For all clarification of liquors may be referred to one of these three causes:

1. Separation from the grosser parts of the liquor from the finer.
2. The equal distribution of the spirits of the liquor, which always render bodies clear and untroubled.
3. The refining of the spirit itself.

And the two latter are consequents of the first, which is effected chiefly by precipitation, the instruments whereof are weight and viscosity of the body mixed with it; the one causing it to cleave to the gross parts of the liquor flying up and down in it; the other sinking them to the bottom.

But this being more than vintners commonly understand, they rest not in clarification alone, having found out certain specificks, as it were, to palliate the several vices of wines of all sorts, which make them disgustful. Of these I shall recite two or three of the greatest use and esteem amongst them.

To correct rankness, eagerness, and pricking of sacks, and other sweet wines, they take twenty or thirty of the whitest lime-stones, and slack them in a gallon of the wine; then they add some more wine, and stir them together in a half tub, with a parrelling staff; next they pour this mixture into the hoghead, and having again used the parrelling instrument, leave the wine to settle and then rack it.

This wine may probably be no ill drink for gross bodies and rheumatick pains, but injurious to good fellows of a hot and dry constitution and meagre habits.

Against the pricking of *French* wines they prescribe this easy and cheap composition: take of the powder of *Flanders* tile one pound, of roach allum half a pound, mix them and beat them well, with a convenient quantity of wine; then put them into the hoghead, as the former.

When their *Rhenish* wines prick, they first rack them off into a clean and strongly-scented cask or vat, then they add to the wine eight or ten gallons of clarified honey, with a gallon or two of skim milk, and, beating all together, leave them to settle.

Sometimes it happens, that claret loses much of its briskness and piquantness; and in such case they rack it upon a good lee of red wine, and put into it a gallon of Sloes or Bullace, which, after a little fermentation and rest, makes the wine drink brisk and rough.

To meliorate the taste of hungry and too eager white wines, they draw off three or four gallons of it, and infusing therein as many pounds of *Malaga* Raisins stoned, and bruised in a stone-mortar, till the wine has sufficiently imbibed their sweetness and tincture (which it will do in a day's time), they run it through an *Hippocras* Bag; then put it into a fresh cask well scented, together with the whole remainder of the wine in the hoghead, and so leave it to fine.

To help stinking wines, the general remedy is racking them from their old and corrupt lee; besides which, some give them a fragrant smell or flavour, by hanging in them little bags of spices, such as Ginger, Zedoary, Cloves, Cinnamon, Orris-roots, Cubeb, Grains of Paradise, Spike-nard, and other aromatics.

Others boil some of these spices in a pottle of good sound wine of the same sort, and tun up the decoction hot.

Others correct the ill flavour of rank-lead *French* wine with only a few Cinnamon canes hung in them.

Others again, for the same purpose, use Elder-flowers and tops of Lavender.

Having thus run over the Vintners Dispensatory, and described many of their principal receipts or secrets, for the cure of the acute diseases of wine, we shall come to the fourth head, which contains medicaments proper for their chronick distempers, *viz.* loss of spirits, and decay of strength.

Concerning these, therefore, it is observable, that as when wines are in preternatural commotions, from an excess and predomination of their sulphureous parts, the grand medicine is to rack them from the lees; so on the contrary, when they decline and tend towards palling, by reason of the scarcity of their spirits and sulphur, the most effectual preservative is to rack them upon other lees, richer and stronger than their own; that being from thence supplied with the new spirits, they may acquire somewhat more of vigour and quickness.

I say preservative; because there is, in truth, no restoring of wines after they are perfectly palled and dead, for nothing that is past perfection, and hath run its natural race once, can receive much amendment.

But besides reinforcing of impoverished wines, by new and more generous lees, there are sundry confections, by which also, as by cordials, the languishing spirits of many of them may be sustained, and, to some degree, recruited, of which the following are examples:

When sacks begin to languish (which doth not often happen, especially in this city, where it is drunk in plenty), they refresh them with a cordial syrup, made of most generous wine; sugar, and spices.

For *Rhenish* and white wines, a simple decoction of Raisins of the sun, and a strong-scented cask, usually serve the turn.

For claret inclining to a consumption, they prescribe a new and richer lee, and the shavings of Fir-wood, that the spirit, being recruited by the additional lee, may be kept from the exhaling by the unctuous spirit of the turpentine.

This artifice is used in *Paris* in the most delicate and thin-bodied wines of *France*, and is very probably the cause of that exceeding dulness and pain of the head, which always attends debauches with such wines.

Nor is it a modern invention, but well known to, and frequently used by the *Romans*, in the time of their greatest wealth and luxury; for *Pliny* (*Hist. Nat. lib. 14. cap. 2.*) takes singular notice of the custom of the *Italian* vintners, in mixing with their wines turpentine of several sorts.

The *Grecians* long before had their *vina picata* and *resinata*, as is evident by the commendation of such wines by *Plutarch*, and the prescription of them to women, in some cases, by

Hippocrates; and they were so much delighted with their *vinum pissites*, that they consecrated the Pitch-tree to *Bacchus*; but I shall next take some notice of the more disingenuous practices of vintners in the transmutation or sophistication, which they call trickings or compassings.

They transform poor *Rochelle* and *Coniac* white wines into *Rhenish*; *Rhenish* into sack; the lags of sack and malmseys into muscadels.

They counterfeit Raspie wine with *Fleur-de-llys* roots; *Verdea* with decoctions of Raisins; they sell decayed *Xeres*, vulgarly sherry, for *Lusenna* wine; in all these impostures deluding the palate so nearly, that few are able to discern the fraud, and keeping these arcana so close, that few can come to the knowledge of them.

As for their metamorphosis of white into claret, by dashing it with red, nothing is more commonly either done or known.

For their conversion of white into *Rhenish*, they have several artifices to effect it, among which this is the most usual:

They take a hoghead of *Rochelle* or *Coniac*, or *Nantz* white wine; rack it into a fresh cask strongly scented; then give the white parell; put into it eight or ten gallons of clarified honey, or forty pounds of coarse sugar, and, beating it well, leave it to clarify.

To give this mixture the delicate flavour, they sometimes add the decoction of the yellow *Clary*-flowers, or *Galitricum*, of which drugs there is an incredible quantity used yearly at *Dort*, where the staple of *Rhenish* wines was; and this is that drink with which the *English* ladies were wont to be so delighted, under the specious name of *Rhenish* in the must.

The manner of making adulterate bastard is thus:

Take four gallons of white wine, three gallons of old *Canary*, five pounds of bastard syrup; beat them well together, put them into a clean rundlet well scented, and give them time to fine.

Sack is made of *Rhenish*, either by a strong decoction of *Malaga* Raisins, or by a syrup of sack, sugar, and spices.

Muscadel is sophisticated with the lags of sack or *Malmsey* thus:

They dissolve it in a convenient quantity of *Rose-water*; of musk two ounces, of *Calamus Aromaticus* powdered one ounce, of *Coriander* beaten half an ounce, and while this infusion is yet warm, they put it into a rundlet of old sack or *malmsey*, and this they call a flavour for muscadel.

There are many other ways of adulterating wines in this city; but because they all tend to the above-mentioned alterations, and are not so general, I shall pass them over, and mention the observations of a certain curious author on this subject.

The mystery of wines consists in the making and meliorating of natural wines.

Melioration is either of sound or vicious wines. Sound wines are bettered,

1. By preserving.
2. By timely fining.
3. By mending colour, smell, and taste.

1. To preserve wines, care must be taken that after the pressing they may ferment well, for without good fermentation they become qually, *i. e.* cloudy, thick, and dusky, and will never fine themselves, as other wines do; and when they are fined by art, they must be speedily spent, or else they will become qually again, and then will not be recoverable by any art.

To preserve *Spanish* wines, and chiefly *Canary*, and therefore principally that which is *razie*, which will not keep long, they make a layer of Grapes and *Giesse*, whereby it acquires a better durance and taste, and a white colour, most pleasing to the *English*.

Razie wine is so called, because it comes from *Rhenish* Vine cuttings, sometimes renewed. The Grapes of this Vine are fleshy, yielding but a little juice.

The *French* and *Rhenish* wines are chiefly and commonly preserved by the ratch, thus used at *Dort* in *Holland*:

They take twenty or thirty pounds of brimstone, rack into it melted, as Cloves, Cinnamon, Mace, Ginger, and Coriander-seeds; and some, to save charges, use the reliques of the *Hippocras* Bag, and, having mixed these well with the brimstone, they draw through this mixture, long, square, narrow pieces of canvas, which pieces they light, and put into the vessel at the bung-hole, and presently stop it close: great care is to be had in proportioning the brimstone to the quantity and quality of the wine, for too much makes it rough. This smoking keeps the wine long white and good, and gives it a pleasant taste.

There is another way for *French* and *Rhenish* wines, *viz.* firing it. It is done in a stove, or else a good fire made round about the vessel, which will gape wide, yet the wine never runs out. It will boil, and afterwards may soon be racked.

Secondly, For timely fining of wines. All wines in the must are more opacous and cloudy. Good wine soon fines, and the gross lees settle quickly, and also the flying lee in time. When the grosser lees are settled, they draw off the wine; this is called racking. The usual times for racking are *Midsummer* and *Allhallowtide*.

The practice of the *Dutch* and *English* to rid the wine of the flying lees speedily, and which serves most for *French* and *Spanish* wine, is thus performed:

Take of isinglass half a pound; steep it in half a pint of the hardest *French* wine that can be got, so that the wine may fully cover it; let them stand twenty-four hours; then pull and beat the isinglass to pieces, and add more wine; four times a day squeeze it to jelly, and as it thickens add more wine. When it is full and perfectly jellied, take a pint or quart to a hoghead, and so proportionably; then overdraw three or four gallons of that wine you intend to fine, which mix well with the said quantity of jelly; then put this mixture to the piece of wine, and beat it with a staff, and fill it top full.

Note, That *French* wines must be bunged up very close, but not the *Spanish*; and that isinglass raises the lees to the top of strong wines, but in weaker precipitates them to the bottom.

They mend the colour of sound clarets by adding thereto red wine, tent, or *Alicant*; or by an infusion of Turnsole, made in two or three gallons of wine, and then putting it into the vessel, to be then (being well stopp'd) rolled for a quarter of an hour.

This infusion is sometimes twice or three times repeated, according as more colour is to be added to the wine; about three infusions of the Turnsole are sufficient; but then it must be rubbed and wringed.

Claret over-red is amended with the addition of white wines.

White wines coming over sound, but brown, are thus remedied:

Take of alabaster powder, overdraw the hoghead three or four gallons; then put this powder into the bung, and stir and beat it with a staff, and fill it top-full. The more the wine is stirred, the finer it will come upon the lee, that is, the finer it will be.

To colour sack-white: Take of white starch two pounds, of milk two gallons, boil them together two hours; when cold, beat them well with a handful of white salt, and then put them into a clean but sweet butt, beating them with a staff, and the wine will be pure and white.

One pound of the before mentioned jelly of isinglass takes

away the brownness of *French* and *Spanish* wines, mixed with two or three gallons of wine; according as it is brown and strong, more or less to be used. Then overdraw the piece of wine about eight gallons, and use the rod; then fill the vessel full, and in a day or two it will be fine, and be white, and mend if qually.

The first buds of *Ribes nigra*, *i. e.* black Currants, infused in wines, especially *Rhenish*, make it diuretick, and more fragrant in smell and taste, and so doth Clary.

The inconvenience is, that the wine becomes more heady: a remedy for which is Elder-flowers added to the Clary, which also betters the fragrancy thereof, as it is manifest in Elder-vinegar; but these flowers are apt to make the wine rosy.

To help brown *Malagas* and *Spanish* wines: Take powder of Oris-roots and Salt-petre, of each four ounces, the whites of eight eggs, to which add as much salt as will make a brine; put this mixture into wine, and mix them with a staff.

To meliorate muddy and tawny clarets: Take of rain-water two pints, the yolks of eight eggs, salt a handful; beat them well, let them stand six hours before you put them into the cask, then use the rod, and in three days it will come to itself.

To amend the taste and smell of *Malaga* wine: Take of the best Almonds four pounds, make an emulsion of them with a sufficient quantity of the wine to be cured; then take the whites and yolks of twelve eggs, beat them together with a handful of salt, put them into the pipe, using the rod.

To amend the smell and taste of *French* and *Rhenish* wines, which are foul: Take one pound of honey, a handful of Elder-flowers, an ounce of Orris-powder, one Nutmeg, a few Cloves to an auln of the wine, boil them in a sufficient quantity of the wine to be cured, to the consumption of half, and when it is cold, strain it, and use it with the rod; some add a little salt. If the wine be sweet enough, add one pound of the spirits of wine to a hoghead, and give the cask a strong scent. Spirit of wine makes any wine brisk, and fines it, without the former mixture.

A lee of the ashes of Vine branches, *viz.* a quart to a pipe, being beaten into wine, cures the ropiness of it, and so infallibly doth a lee of oaken ashes.

For *Spanish* rosy wine: Rack it from the lees into a new-scented cask, then take of allum one pound, of Orris-roots powdered half a pound, beat them well into the wine with a staff; some add fine and well-dried sand, put warm to the wine. If the wine besides prove brown, add three pottles of milk to a pipe: this cures rosy wine, before it begins to fret.

To amend and preserve the colour of clarets: Take red Beet-roots, *q. s.* scrape them clean, and cut them into small pieces; then boil them in *q. s.* of the same wine, to the consumption of the third part; scum it well, and when cool decant off what is clear, and use the rod.

Firing of wines in *Germany* is thus performed: They have in some vaults three or four stoves, which they heat very hot; others make fires almost before every vat; by this means the must fermenteth with that vehemency, that the wine appears between the staves; when this ebullition, fermentation, and working cease, they let the wine stand some days, and then rack it. This firing is only used in cold years, when the wine falls out green.

To set old wine a fretting, being deadish and dull of taste: Take of stum two gallons to a hoghead, put it hot upon the wine, then set a pan of fire before the hoghead, which will then ferment till all the sweetness of the stum is communicated to the wine, which thereby becomes brisk and pleasant.

Some use this stumming at any time; some in *August* only, when the wine hath a disposition to fret of itself, more or less stum to be added, as the wine requires.

The best time to rack wine is in the decrease of the moon, and when the wine is free from fretting, the wind being at north-east or north-west, and not at south, the sky serene, free from thunder and lightning.

Having thus given an account of the different practices of the vigneron, vintners, and wine-coopers, in the management of their several wines, I shall next offer a few things which have occurred to me from some observations and experiments, relating to the making of wines in *England*.

The Grapes being ripe, should be cut when they are perfectly dry, and carried into a large dry room, where they must be spread upon Wheat-straw, in such a manner as not to lie upon each other; in this place they may remain a fortnight, three weeks, or a month, according as there is conveniency, observing to let them have air every day, that the moisture perspired from the Grapes may be carried off. Then, having the presses and other things in order, you should proceed in the following manner: First, all the Grapes should be pulled off the bunches, and put into tubs, being careful to throw away such as are mouldy, rotten, or not ripe, which, if mixed with the others, will render the wine less delicate; and if the stalks of the bunches are pressed with the Grapes, there will be an austere juice come from them, which will render the wine acid and sharp; this, I fear, has spoiled a great quantity of wine which was made in *England*, which, if otherwise managed, might have proved very good; for we find in *France*, and other wine countries, where persons are desirous of having good wine, they always pick the Grapes from off the stalks before they are pressed, though indeed the common vigneron, who have more regard to the quantity than the quality of their wines, do not practise this. But as in *England* we labour under the inclemency of climate, we should omit nothing of art which may be necessary to help the want of sun.

The Grapes being thus carefully picked off, should be well pressed, and if it is designed for red wine, the husks and stones should be put into the liquor; and if the seeds or stones of the Grapes are broken in the press, the wine will have more strength, which must be put into a large vat, where the whole should ferment together five or six days; after which the wine should be drawn off, and put into large casks, leaving the bung-hole open to give vent to the air which is generated by the fermentation. But it must be remarked, that after the wine is pressed out, and put into the vat with the husks, if it does not ferment in a day or two at most, it will be proper to add a little warmth to the room by fires, which will soon put it into motion; and for want of this it often happens, where people press their wine, and leave it to ferment in open cold places, that the nights being cold, check the fermentation, and so cause the wine to be foul, and almost ever after upon the fret. This husbandry is much practised upon the *Rhine*, where they always have stoves placed in the houses where the wine is fermented, wherein they keep fires every night, if the season is cold, while the wines are fermenting.

If white wine is desired, then the husks of the Grapes should not remain in the liquor above twelve hours, which will be long enough to set it a fermenting; and when it is drawn off, and put into other vessels, it should not remain there above two days before it is drawn off again; and this must be repeated three or four times, which will prevent its taking any tincture from the husks in fermenting.

When the greatest fermentation is over, the wine should be drawn off into fresh casks, which must be filled to the top, but the bung-hole should be left open three weeks or

a month, to give vent to the generated air, and that the scum may run over; and as the wine subsides in the casks, they should be carefully refilled with wine of the same sort from a store-cask, which should be provided for that purpose; but this must be done with much care, lest, by hastily refilling the casks, the scum, which is naturally produced upon all new wines, should be broken thereby, which will mix with the wine, and foul it, causing it to take an ill taste; therefore it would be proper to have a funnel, which should have a plate at the small end, bored full of little holes, that the wine may pass through in small drops, which will prevent its breaking the scum.

After the wine has remained in this state a month or six weeks, it will be necessary to stop up the bung-hole, lest, by exposing it too much to the air, the wine should grow flat, and lose much of its spirit and strength; but it must not be quite stopped up, but rather should have a pewter or glass tube, of about half an inch bore, and two feet long, placed in the middle of the bung-hole. The use of this tube is to let the air, which is generated by the fermentation of the wine, pass off, because this being of a rancid nature, would spoil the wine, if it were pent up in the cask, and in this tube there may always remain some wine, to keep the cask full, as the wine subsides; and, as it shall be necessary, the wine in the tube may be easily replenished. For want of rightly understanding this affair, a great quantity of the choicest wines of *Italy*, and other countries, have been lost. A great complaint of this misfortune I received from a very curious gentleman in *Italy*, who says, *Such is the nature of this country wines in general (nor are the choicest Chianti's excepted), that at two seasons of the year, viz. the beginning of June and September, the first when the Grapes are in flower, and in the other when they begin to ripen, some of the best wines are apt to change, especially at the latter season; not that they turn eager, but take a most unpleasant taste, like that of a rotten Vine leaf, which renders them not only unfit for drinking, but also to make vinegar of, and is called the Settembrine. And what is most strange is, that one cask, drawn out of the same vat, shall be infected, and another remain perfectly good, and yet both have been kept in the same cellar.*

As this change happens not to wines in staves (though that will turn eager), I am apt to attribute it to some fault in refilling the cask, which must always be kept full, which, either by letting alone too long, till the decrease be too great, and the scum there naturally is on all wines, thereby being too much dilated, is subject to break, or else, being broken by refilling the cask gives it that vile taste. But against this there is a very strong objection, i. e. that this defect seizes the wine only at a particular season, viz. September; over which if it gets, it will keep good many years, so the case is worthy the enquiry of naturalists, since it is evident that most wines are more or less affected with this distemper, during the first year after making.

Upon receiving this information from *Italy*, I consulted the Rev. Dr. Hales of *Teddington*, who was then making many experiments on fermenting liquors, and received from him the following curious solution of the cause of this change in wine, which I sent over to my friend in *Italy*, who has tried the experiment, and it has accordingly answered his expectation, in preserving the wine, which was thus managed, perfectly good. He has also communicated the experiment to several vigneron in several parts of *Italy*, who are repeating the same, which take in Dr. Hales's words:

From many experiments which I made the last summer, I find that all fermented liquors generate air in large quantities, during the time of their fermentation; for, from an experiment made on twelve cubick inches of Malaga Raisins, put into eighteen cubick inches of water the beginning of March, there were 411 cubick inches of air generated by the middle of April; but afterwards, when the fermentation was over, it reformed a great quantity of

this air; and from forty-two cubick inches of ale from the tun (which had fermented thirty-four hours before it was put into the bolt-head) had generated 639 cubick inches of air from the beginning of March to the middle of June; after which it re-ferbed thirty-two cubick inches of air; from whence it is plain, that fermented liquors generate air, during the time of their fermentation, but afterwards they are in an imbibing state, which may perhaps account for the alteration of the nice Italian wines; for wine, during the first year after making, continues fermenting more or less, during which time a great quantity of air is generated, until the cold in September put a stop to it, after which it is in an imbibing state. Now the air thus generated is of a rancid nature (as the Grotto del Cano), and will kill a living animal, if put into it. So that if, during the fermentation of the wine, there are two quarts of this rancid air generated, which is closely pent up in the upper part of the vessel, when the cold shall stop the fermentation, the wine, by absorbing this air, becomes foul, and acquires this rancid taste; to prevent which, I would propose the following experiment:



Suppose the vessel A filled with wine, in the bung-hole of this vessel b, I would have a glass tube of two feet long, and about two inches bore, fixed with a pewter socket closely cemented, so as that there may be no vacuities on the sides; and into this tube should be another, of about half an inch bore, closely fixed; the lower tube should always be kept about half full of wine, up to X, which will supply the vessel, as the wine therein shall subside; so that there will be no room left in the upper part of the vessel to contain any generated air, which will pass off through the upper small tube, which must be always left open for this purpose; and the tube being small, there will be no danger of letting in too much air to the wine.

As the wine in the lower tube shall subside, it may be refilled by introducing a slender funnel through the small tube, down to the scum upon the surface of the wine in the larger tube, so as to prevent its being broken, by the wine falling too violently upon it. This experiment, being tried with glass tubes, will give an opportunity to observe what impression the different states of the air have upon the wine, by its rising or falling in the tubes; and if it succeeds, it may be afterwards done by wooden or metal tubes, which will not be in danger of breaking.

This curious experiment, having succeeded wherever it has yet been tried, will be of great service in the management of the wines, there being many useful hints to be taken from it, particularly with regard to fermenting wines; for, since we find that wines too long fermented (especially those which are produced in cool countries) seldom keep well, so, by letting them stand in a cool place, the fermentation will be checked, which is agreeable to the practice of the *Champagnois*, who keep the wines in winter in cellars above ground; but when the weather grows warmer in spring, they then carry them down into their vaults, where they are cooler than in the cellars; and this method of removing their wines from the cellars to the vaults, and back again into the cellars, as the seasons of the year shall require, is found of great service in preserving the wines in perfection; for these wines being weak (when compared with those produced in more southern countries), have not body enough to maintain them, if they are permitted to ferment all the succeeding summer, which the heat of the season will promote where the wine is exposed to its influence; and this surely must be worth the trial by those who make wine in this country, since it is the practice of the northern countries, which is the most proper for our imitation, and not that of the most southern.

But after the wine has passed its fermentation in the vat, and is drawn off in the casks, it will require something to feed upon; so that you should always preserve a few bunches of the best Grapes, which may be hung up in a room for

that purpose, until there be occasion for them; when they should be picked off the stalks, and two or three good handfuls put into each cask, according to their several sizes; for want of this, many times people make use of other things, which are by no means so proper for this purpose.

The vigneron of different countries do also put various sorts of herbs into the vat, when the wine is fermenting, to give it different flavours. Those of *Provence* make use of Sweet-marjoram, Balm, and other sorts of aromack herbs; and upon the *Rhine* they always put some handfuls of a peculiar kind of Clary into the vats, from whence arise the different flavours we observe in wines, which, it is possible, were made in the same manner, and from the same sorts of Grapes. How far this might be thought worth practising in *England*, a few experiments would inform us; though it is to be questioned, whether these herbs mend the wine, because it seems to obtain amongst the Vignerons, purely to alter the flavour of their wines, in order to render them agreeable to the palate of their particular customers; but, however this be, it is yet certain, that there is some art used to alter the flavour of the wine, in most of the different wine countries of *France*, for it is the same sort of Grape which the curious always plant in *Orleans*, *Champagne*, and *Burgundy*; and how different these wines are in their flavour and quality, every one who is acquainted with them well knows; and this difference can never be effected by the situation of the places, since there is no very great difference in the heat of those countries; nor do I believe their different ways of making the wine can alter their flavour so much, especially those of *Orleans* and *Burgundy*, where there is little difference in their management; but in *Champagne* there is this difference from the rest, that they always cut their Grapes in a morning, before the dew is gone off, or in cloudy weather; whereas the vigneron of all the other places, never cut any till they are perfectly dry, which may occasion a great alteration in the wine.

The method commonly practised to give the red colour to wine, is to let it ferment a few days upon the skins, which they always observe to press two or three times, in order to make them discharge their contents; but where a deep-coloured rough wine is desired, there they put a quantity of a certain sort of Grape, whose juice is red, into each vat; this is well known in *England* by the name of *Claret Grape*; the leaves of this Vine always change to a deep purple colour as the fruit ripens, and the Grapes are of a fine blue colour, with a flue over them like fine Plums; but the juice of them is very austere, especially if they are not very ripe.

This red wine will not require to be drawn off into casks more than at first from the vat, for it may remain in the same vessel until it is fit to bottle off, which, I think, should not be done till the wine is two years old; the greater quantity of wine there is in each vessel, the more force it will have, and so consequently be in less danger of suffering from the injuries of weather, especially if the before-mentioned method be practised; but where there are large quantities of wine preserved in close vaults, people should be very cautious how they at first enter them, after they have been shut up for some time; because the air of this vault will become rancid from the mixture of the generated air proceeding from the wines, which has often killed people who have incautiously entered them.

WINTER. [*Prognosticks of a hard winter.*] The lord Bacon gives these as signs or forerunners of a hard winter.

If stone or wainscot, that has been used to sweat (as it is called), be more dry in the beginning of winter, or the drops of eaves of houses come down more slowly than they used to do, it portends a hard and frosty winter. The reason is, that it shews an inclination in the air to dry weather,

weather, which, in the winter time, is always joined with frost.

Generally a moist and cool summer betokens a hard winter likely to ensue. The reason is, that the vapours of the earth, not being dissipated by the sun in the summer, do rebound upon the winter.

A hot and dry summer, especially if the heat and drought extend far in *September*, betokens an open beginning of winter, and cold to succeed towards the latter part of the winter, and in the beginning of the spring; for all that time the former heat and drought bear the sway, and the vapours are not sufficiently multiplied.

An open and warm winter portends a hot and dry summer; for the vapours disperse into the winter showers, whereas cold and frost keep them in, and transport them into the late spring and summer following.

When birds lay up Haws and Sloes, and other stores, in old nests and hollow trees, it is a sign of a hard winter approaching.

If fowls or birds, which used at certain seasons to change countries, come earlier than the usual time, they shew the temperature of the weather, according to that country from whence they came; as the winter birds, fieldfares, snipes, woodcocks, &c.

If they come earlier, and out of the northern countries, they intimate cold winters likely to ensue with us. And if it be in the same country, they shew a temperature of season, like that of the season in which they come; as bats, cuckoos, nightingales, and swallows, which come towards summer if they come early, it is a sign of a hot summer to follow. Cold dews and morning rains, about *Bartholomew-tide*, and hoar frost in the morning about *Michaelmas*, foretel a hard winter.

WOODS and groves are the greatest ornaments to a country seat, therefore every seat is greatly defective without them; wood and water being absolutely necessary to render a place agreeable and pleasant. Where there are woods already grown to a large size, so situated as to be taken into the garden or park, or so nearly adjoining, as that an easy communication may be made from the garden to the wood; they may be so contrived by cutting of winding walks through them, as to render them the most delightful and pleasant parts of a seat (especially in the heat of summer), when those walks afford a goodly shade from the scorching heat of the sun.

As I have already treated of the use and beauty of wildernesses, and have giving directions for the making and planting of them, I shall not enlarge much upon that head in this place; therefore I shall only give some short instructions for the cutting and making of these wood walks, in those places where persons are so happy as to have any grown woods so situated as to be near the habitation, and are either taken into the garden, or walks made from the house or garden leading to them; as also how to plant or decorate the sides of these walks with shrubs and flowers, so as to render them agreeable and pleasant; and then I shall more fully treat of the method to raise and improve woods, so as to be of the greatest advantage to the possessor, and a publick benefit to the nation.

Where persons have the convenience of grown woods near their habitation, so as that there may be an easy communication from one to the other, there will be little occasion for wildernesses in the garden; since the natural woods may be so contrived, as to render them much pleasanter than any new plantation can possibly arrive to within the compass of twenty years, where the trees make the greatest progress in their growth; and in such places where their growth is slow, there cannot be expected shade equal to the grown woods in double that number of years; but there is not on-

ly the pleasure of enjoying a present shade from these woods, but also a great expence saved in the planting of wildernesses, which, if they are large, and the trees to be purchased, will amount to no small sum.

If the wood is so situated, as that the garden may be contrived between the house and that, then the walk into the wood should be made as near to the house as possible, that there may not be too much open space to walk through in order to get into the shade; if the wood is of small extent, then there will be a necessity for twisting the walks pretty much, so as to make as much walking as the compass of ground will admit; but there should be care taken not to bring the turns so near each other as that any two walks may be exposed to each other, for want of a sufficient thickness of wood between; but where the wood is large, the twists of the walks should not approach nearer to each other than fifty or sixty feet; or in very large woods they should be at a greater distance; because, when the underwood is cut down, which will be absolutely necessary every tenth or twelfth year, according to its growth, then the walks will be quite open until the underwood grows up again, unless a border of shrubs, intermixed with some evergreens, is planted by the sides of the walks; which is what I would recommend, as this will greatly add to the pleasure of these walks.

These wood walks should not be less than eight or nine feet broad in small woods; but in large ones fifteen feet will not be too much, and on each side of the walks. The border of shrubs and evergreens may be nine or ten feet broad; which may be so managed, as to shut out the view from one part of the walk to the other at those times when the underwood is cut down; at which times there will be an absolute occasion for such plantations, and at all times they will afford great pleasure by adding to their variety, as also by their fragrant odour.

The former method, which was practised in cutting these walks through woods, was to have them as strait as possible; so that there was much trouble to make fights through the woods, for direction how to cut them; but where this was practised, every tree which stood in the line, good and bad, was cut down, and many times boggy or bad ground was taken into the walks, so that an expence of draining and levelling was necessary to render them proper for walking on; besides this, there were many other inconveniencies attending these strait cuts through woods, as, first, by letting in a great draught of air, which in windy weather renders the walks unpleasant; and these cuts will also appear at a great distance from the woods, which will have a very bad effect; therefore the modern practice of twisting the walks through woods is to be preferred. In the cutting of these walks there should be particular care taken to lead them over the smoothest and soundest part of the ground, as also to avoid cutting down the trees; so that whenever these stand in the way, it will be better to lead the walk on one side than to have the tree stand in the middle; for although some persons may contend for the beauty of such trees which are left standing in walks, yet it must be allowed, that unless the walk is made much broader in those places than in the other, the trees will occasion obstructions to the walkers or riders, especially when several persons are walking together, so that it will be much better to have the walks entirely clear from trees; and where any large spreading tree stands near the walk, to cut away the small wood so as to make an opening round the trees, where there may be some seats placed for persons to rest under the shade. The turns made in these walks should be as easy and natural as possible; nor should there be too many of them, for that will render the walking through them disagreeable; therefore the great skill in making of these

these walks is, to make the turns so easy as not to appear like a work of art, nor to extend them strait to so great length, as that persons who may be walking at a great distance may be exposed to the sight of each other; both these extremes should be avoided as much as possible, since they are equally disagreeable to persons of true taste. When a wood is properly managed in this way, and a few places properly left like an open grove, where there are some large trees so situated as to form them, there can be no greater ornament to a fine seat than such a wood.

We shall now treat of the culture of woods for profit to the possessor, and publick benefit of the nation.

The great destruction of the woods and forests which has been of late years made in this country, should alarm every person who wishes well to it; since there is nothing which seems more fatally to threaten a weakening, if not a dissolution, of the strength of this once famous and flourishing nation, than the notorious decay of its timber: and as this devastation has spread through every part of the country, so unless some expedient be seriously and speedily resolved on, to put a stop to this destruction of the timber, and also for the future increase of it, one of the most glorious bulwarks of this nation will, in a few years, be wanting to it.

And as there are small hopes of this being remedied by those entrusted with the care of publick woods, since their private interest is so much advanced by the destroying the timber, which they were appointed to preserve; therefore, unless private persons can be prevailed on to improve their estates, by encouraging the growth of timber, it is greatly to be feared, that in an age there will be a want of it for the supply of the navy; which, whenever it happens, must put a period to the trade of this country.

It has been often urged, by persons whose judgment in other affairs might be depended on, that the great plantations, which for several years past have been carried on in several parts of this kingdom, will be of publick benefit by the propagation of timber; but in this they are greatly mistaken, for in most of the plantations which have been made for years past, there has been little regard had to the propagation of timber, present shade and shelter have been principally considered; and in order to obtain these soon, great numbers of trees have been taken out of woods, hedge rows, &c. which, if they had remained in their first situation, might have afforded good timber, but by being transplanted large, are absolutely rendered unfit for any use but fuel; so that the great quantity of plantations which have been made, I fear, will rather prejudice than be of use to the improvement of timber; nor is there any other method of increasing the useful timber of this country, than by sowing the seeds in the places where they are to remain, or in such situations where there are plenty of Oaks in the neighbourhood; if the ground is properly fenced, to keep out cattle and vermin, the Acorns which drop from those trees will soon produce plenty of young trees, which, if properly taken care of, will soon grow to be large.

The two most substantial timbers of this country are the Oak and Chestnut; though the latter has been of late years almost entirely destroyed in *England*, so that there are scarce any remains of trees of size in the woods at present; but there can be no doubt of this tree having been one of the most common trees of this country, as may be proved by the old buildings in many parts of *England*, in which the greatest part of the timber is Chestnut. But as I have already treated largely of the method of propagating both these trees for profit, under their respective titles, I shall not repeat it here. Next to these, the Elm is esteemed as a profitable timber; but of these there are few cultivated in woods, especially in the south part of *England*, where they chiefly grow in hedge rows, or plantations near houses;

but in the north-west part of *England*, there are numbers of very large trees of the Witch Elm growing in parks, and some in woods, as if that tree was a native of this country, which has been much doubted; though as this tree propagates itself by seeds, it may be deemed an indigenous plant in *England*.

The Beech is another tree common in the woods, especially upon the chalky hills of *Buckinghamshire*, *Kent*, *Suffex*, and *Hampshire*, where there are some very large woods entirely of this sort; some of which have been of long standing, as appears by the age of the trees; but whether this tree is a native of this country, has been a point often disputed.

The Ash is a very profitable tree, and of quick growth; so that in less than an age, the trees will arrive to a large size from the seeds, therefore a person may hope to reap the profits of his labour, who sows the seeds; but this is not a beautiful tree to stand near a habitation, being late in the spring in putting out its leaves, and the first that sheds them in autumn; nor is a friendly tree to whatever grows near it, the roots drawing away all the nourishment of the ground, whereby the trees or plants which grow near are deprived of it; so that where the Ash tree grows in hedge rows, the hedges in a few years are entirely destroyed; and if they are in pasture-grounds, and the cows browse on them, the butter made with their milk will be bad; for which reason the Ash should be sown separate in lands which are inclosed, where cattle are not permitted to come, and at a distance from the habitation.

Upon sandy or rocky soils, the *Scotch Pine* will thrive exceedingly, and turn to great advantage to the planter, provided the plants are planted young, and treated in the manner directed in the article *Pinus*, to which the reader is desired to turn to avoid repetition.

There are also several aquatick trees, which are very profitable to those who have low marshy lands, where the harder kinds of timber will not thrive; these are the *Poplars* of several sorts, the *Willow*, *Alder*, &c. but as these, and all the other kinds of trees, have been fully treated of, both as to their propagation and uses, and also an account of the different soils in which each will thrive best, under their respective titles, the reader is referred to them for farther information; and I shall next treat of the general management of woods, of whatever kinds of trees they are composed.

Where there are young woods, great care must be taken of the fences; for if cattle should get in among the trees, they will, in a short time, do infinite damage to them, by browsing on the branches, or barking the trees; and during the first ten years of their growth, they should be secured from hares and rabbits, otherwise, in severe frost, when the ground is covered with snow, whereby they are deprived of other food, they will get into the woods, and eat off the bark from the young trees, and gnaw all the branches within their reach; so that in a few days, where there are plenty of these animals, there may be such destruction made among the young trees, as cannot be retrieved, but by cutting them down to the ground, which will be a loss of several years; therefore those persons who have the care of young woods, should be very diligent in frosty weather in looking over the trees, and stopping the holes in the fences, to keep out all vermin.

Another care to be taken of young woods, is the thinning the trees from time to time, as they increase in their growth; but in doing of this, there must be great caution used, for it should be gradually performed, so as not to open the trees too much, to let the cold air among them, which will greatly retard their growth; nor should the trees be left so close, as to draw each other up like may-poles,

poles, but rather observe a medium in this work, cutting down a few each year, according as there may be necessity for it, being careful not to permit those to stand, which may spoil the growth of the neighbouring trees, always observing to leave those trees which are the most promising.

The young trees in these woods should not be lopped or pruned, for the more they are cut the less they will increase in bulk; every branch which is cut off will rob the tree of its nourishment, in proportion to the size of the branch; therefore the hatchet should not be suffered to come into young woods, unless in the hands of skilful persons.

Where persons have more regard to the future welfare of the timber than their immediate profit, the under wood should be grubbed up as the trees advance, that the roots may have the whole benefit of the soil, and their stems enjoy the free air, without which their stems are generally covered with moss, and their growth greatly stunted; as may be observed in all such woods where there is any quantity of under wood remaining, in which places it is rarely found that the trees do ever grow to a large size; therefore where large timber is desired, the trees must have room to extend their roots and branches, without which it cannot be expected; but from a covetous temper, many people let their under wood remain as long as it will live; for as the timber increases, the under wood will be gradually decaying by the shade and drip of the large trees, so that by this method the timber suffers more in a few years than the value of the under wood; therefore by endeavouring to have both, neither of them can be so good as where they are separately preserved.

If persons who have estates would be careful to nurse up trees in their hedge rows, it would in time become a fortune to their successors; as hereby the timber growing in the hedges may be worth more than the freehold of the estate, which has often been the case with estates from which their possessors have cut down timber for fortunes for their younger children; the frequency of this should encourage persons to be a little more attentive to the growth and preservation of young woods, since the expence and trouble is not great, and the future profit very certain; besides, the pleasure of seeing trees of a man's own sowing make yearly advances, must be very great to those who have any relish for country amusements.

There are several persons who plant copses for cutting every ten or twelve years, according to their growth. These are usually planted in autumn, either with stools or young plants, which are drawn out of the woods; the latter should

always be preferred to the former. These copses are commonly planted with several sorts of trees, as Oak, Beech, Chestnut, Ash, Birch, Willow, &c. but the Ash and Chestnut are the most profitable, where they grow kindly, because the poles of Ash are very valuable; these also are good for hoops, so that there is no danger of having sale for these copse woods when they are fit for cutting; but where the copses are intended to remain, there should be no standard trees left for timber, because as the heads of the trees spread, and over-top the under wood, it will cause that to decay; and where the standards are left upon the stumps of the copse wood they will never grow to a large size, nor will the timber be so valuable as that produced immediately from a young root; therefore whoever will make the experiment, will be convinced that it is more for the advantage of both to keep them in distinct woods.

But where persons plant copses upon land free from trees, it will be the better method to sow the seeds, especially if Chestnut, Oak or Beech, are the trees intended; for although it is a prevailing opinion with the generality of persons, that by planting they save time, yet I am sure of the contrary; for if the seedling plants are kept clear from weeds, they will, in eight or ten years, out-grow those which are planted, and these unremoved copses will continue much longer in vigour than the other; so that for either timber or copse wood, the best method is to prepare the ground well, and secure the fences and sow the seeds, which is so far from losing, that in twenty years it will be found to gain time, which is what every planter wishes to do.

The usual time of felling timber is from *November to February*, at which time the sap in the trees is hardened; for when the sap is flowing in the trees, if they are cut down the worm will take the timber, and cause it to decay very soon; therefore if the durability of the timber is considered, the trees should always be cut in the winter months; but as the bark of the Oak is so valuable for tanning leather, there has been a law passed to oblige persons to cut these trees during the spring season, when the bark will readily peel off; by which the timber is rendered unfit for building either ships or houses, as it will be very subject to cast, rift, or twine, and the worm will soon take it; therefore it would be more for the publick benefit, if a law was enacted to oblige every person to strip off the bark of such trees, as are designed to be cut down in the spring, when the bark will run, leaving the trees with their branches standing till the following winter, which will be found to answer both purposes well.

X.

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XANTHIUM. *Tourn. Inst. R. H. 438. tab. 252.*
 Lesser Burdock.

The Character are,

It hath male and female flowers on the same plant. The male flowers have a common scaly empalement; they are composed of several tubulous funnel shaped florets, which are equal, and disposed in a hemisphere, cut into five segments at the top, and have each five very small stamina, terminated by erect parallel summits. The female flowers are situated under the male by pairs; they have no petals, or stamina, but they are succeeded by oblong, oval, prickly fruit, having two cells, each including one oblong seed, convex on one side, and plain on the other.

The Species are,

1. XANTHIUM caule inermi, aculeis fructibus erectis. Lesser Burdock with an unarmed stalk, and the spines of the fruit erect; or lesser Burdock.

2. XANTHIUM caule inermi, aculeis fructibus incurvis. Lesser Burdock with an unarmed stalk, and incurved spines to the fruit; or Canada Burdock.

3. XANTHIUM spinis ternatis. *Hort. Upsal. 283.* Lesser Burdock, having triple spines.

4. XANTHIUM caule inermi, aculeis fructibus, longissimis erectis simplicibus. Lesser Burdock with an unarmed stalk, and very long erect spines to the fruit which are single.

The first sort grows naturally in *Europe*, and also in *India*, from whence I have received the seeds; it has been found growing wild in a few places in *England*, but of late years it has not been seen in those places. It grew some years past in the road near *Dulwich* college. The stalk of this plant is round, spotted with black; it rises in good ground two feet high, sending out a few side branches. The leaves stand upon long slender foot-stalks. From the wings of the stalks arise the foot stalks of the flowers, which are produced in loose spikes, the male flowers growing at the top, and the female flowers under them; they are of an herbaceous colour, collected into roundish heads. The female flowers are succeeded by oblong oval fruit, closely armed with short erect spines.

This plant has been much esteemed by some physicians for the cure of scrophulous tumours, and also in leprosy, but is rarely now used.

The second sort grows naturally in *North America*. The stalks of this are much thicker, and rise higher than those of the first; the leaves are not hollowed at their base, nor are they divided so deeply on their sides as those of the first; they are unequally indented on their edges, and have three longitudinal veins. The flowers are produced in shorter and looser spikes. The fruit are much larger, and are armed with stronger spines which are incurved.

The third sort grows naturally in *Portugal* and *Spain*. The stalks of this rise three feet high, sending out many branches; these are garnished with oblong leaves which are indented on their edges, ending in acute prickles; of a dark green on their upper side but hoary on their under, having very short foot-stalks. The flowers come out from the sides

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of the branches, two or three at each place, one of which is female, and is succeeded by oblong oval fruit, armed with slender sharp spines which are erect. The stalks and branches are armed with long, stiff, triple thorns on every side, which renders it dangerous to handle them.

The fourth sort was discovered by the late Dr. *Houssoun* in the year 1730, growing naturally at *La Vera Cruz*; this plant rarely grows more than six or seven inches high. The leaves are small, and shaped like those of the second sort; the flowers are produced in loose spikes at the top of the stalks; the fruit is as large as those of the second sort, but the spines are slender, single, and strait.

All these plants are annual. The first will come up from the seeds which fall in autumn, and requires no other care but to thin the plants where they are too close, and keep them clear from weeds; the second sort formerly was as easily cultivated, and came up from the self-sown seeds as readily, and rarely failed to ripen its seeds, but of late years the autumns have proved so bad, as that the seeds have not come to maturity.

The third sort will perfect its seeds some years on self-sown plants; but as they sometimes fail, the sure way is to raise the plants on a gentle hot-bed, and, after they have obtained strength, plant them on a warm border on a lean soil, which will stint the plants in their growth, and cause them to be more fruitful; for when they are planted in rich ground the plants will grow to a large size, and will not produce flowers till late in autumn, so the seeds will not ripen.

The fourth sort must be raised on a hot-bed in the spring, and the plants should be transplanted each into a small pot, and plunged into a fresh hot-bed to bring them forward. After they have obtained strength they should be inured to the free air gradually, and in *June* some of the plants may be turned out of the pots, preserving the ball of earth to their roots, and planted in a south border, where, if the season proves favourable, they will perfect their seeds.

XANTHOXYLUM. *Lin. Gen. Plant. 335.* The Tooth-ach-tree.

The Characters are,

The flower has no empalement, but has five oval petals, and five slender stamina, which are longer than the petals, terminated by furrowed summits; it has three germen, which are united at their base, having each a lateral style crowned by obtuse stigmas. The germen after-ward become so many capsules, each containing one roundish, hard, shining seed.

The Species are,

1. XANTHOXYLUM foliis pinnatis, foliolis lanceolatis serratis petiolatis. Tooth-ach-tree with winged leaves, having spear-shaped sawed lobes growing upon foot-stalks.

2. XANTHOXYLUM foliis pinnatis, foliolis oblongo ovatis integerrimis sessilibus. Tooth-ach-tree with winged leaves, having oblong, oval, entire lobes without foot-stalks, commonly called broad-leaved Tooth-ach-tree.

The first sort grows naturally in *South Carolina*, where it rises to the height of fifteen or sixteen feet. The stem is woody, covered with a whitish rough bark, armed with short thick spines; these grow to a large size as the trunk increases in bulk, so as to become protuberances terminating in spines. The leaves are sometimes placed by pairs, and at others they stand without order; they are composed of three, four, or five pair of spear-shaped lobes placed opposite, terminated by an odd one, of a deep green on their upper side, and of a yellowish green below, a little sawed on their edges, and stand upon short foot-stalks. At the end of the branches come forth the foot-stalks which sustain the flowers; these branch out, and form a loose panicle. The flowers are composed of five white petals, which are small, and having no cover, they are by some called the empalement; but being of a different colour from the leaves, I shall take the liberty to stile them petals. Within these are situated five stamina, which are terminated by reddish summits, and in the hermaphrodite flowers there are three styles fastened to the side of the germen. After the flower is past, the germen turns to a roundish four-cornered capsule, each containing one roundish, hard, shining seed. It is sometimes called Pellitory-tree.

This has been generally confounded with the prickly Yellow Wood or Yellow *Hercules* of Sir *Hans Sloane*, but is very different from that; for in the *West-Indies* it is one of their largest timber trees, and the specimens which I have received from *Jamaica*, are very different from those of *Carolina*. The leaves of the former are twice as large as those of the latter; the lobes of the leaves are almost three inches long, and an inch and a half broad; they sit close to the foot-stalk, and the leaves are equally winged, having no single lobe at the end. The flowers of this I have not seen, but the capsules have five cells, each containing one black, shining, hard seed.

The second sort grows naturally in *Pensylvania* and *Maryland*; this hath a woody stem, which rises ten or twelve feet high, sending out many branches toward the top; these have a purplish bark, and are armed with short thick spines standing by pairs. The leaves are unequally winged, and are composed of four or five pair of oblong oval lobes, terminated by an odd one; these stand close to the midrib, having no foot-stalks. The midrib is armed on the under side with some small spines. The upper side of the leaves is of a deep green, and their under of a pale green; they have a warm biting taste. The bark of the tree is used for curing the tooth-ach, from whence it has the name. The flowers grow in loose panicles like those of the former sort, and these are succeeded by fruit with five cells, each including one hard shining seed.

These plants are generally propagated by seeds, but as these never ripen in this country, they must be procured from those places where they naturally grow. When the seeds arrive in *England*, they should be sown in pots as soon as possible, for they do not grow the first year; and when they are kept out of the ground till spring, they frequently lie two years in the ground before the plants appear; therefore the pots should be plunged into the ground up to their rims, in an east-angled border, where they may remain during the summer; this will prevent the earth in the pots from drying too fast, which it is very apt to do when the pots are set upon the ground in the sun. The only care to be taken of the seeds, is to keep the pots constantly clean from weeds, and in very dry weather refresh them now and then with water. In autumn the pots should be placed under a common hot-bed frame, where they may be screened from frost, or else plunged into the ground in a warm border, and covered with tan to keep out the frost, and the following spring they should be plunged into a hot-bed, which

will bring up the plants. When these appear, they must be frequently, but sparingly watered, and kept clean from weeds; and, as the summer advances, they should be gradually inured to bear the open air, into which they should be removed in *June*, placing them in a sheltered situation, where they may remain till autumn, when they must be placed in a hot-bed frame to shelter them in winter. The spring following, before the plants begin to shoot, they should be carefully taken up, and each planted into a separate small pot; these may be plunged into a gentle hot-bed, which will forward them greatly in putting out new roots. The after care must be to shelter them for a year or two in winter, until the plants have gotten strength; then in the spring, after the danger of frost is over, some of them may be turned out of the pots, and planted in the full ground in a sheltered situation, where the second sort will thrive very well, and resist the cold; but the first is not quite so hardy, so these may be planted against a south wall, where they will thrive very well. Some of the plants of this sort had been planted in the open air in the *Chelsea* garden, some years, where they had thriven and endured the cold without any covering; but the severe winter in 1740, destroyed them all. These plants may be increased by cutting off some of their strong roots, preserving their fibres to them, and planted in pots filled with light earth, plunging them into a moderate hot-bed, which will cause them to push out, and become plants; but these will not thrive so well, nor grow near so large as those which are raised from seeds; the roots will also put out suckers, whereby the plants may be increased.

XERANTHEMUM. *Tourn. Inst. R. H. 499. tab. 284.*
Eternal flower.

The Characters are,

The flower is composed of hermaphrodite and female florets, which have one common scaly empalement. The hermaphrodite florets, which form the disk, are funnel-shaped, and cut into five points; the female florets, which compose the border or rays, are tubulous, and cut into five less equal points; the hermaphrodite florets have five short stamina, terminated by cylindrical summits, and a short germen, supporting a slender style, crowned by a bifid stigma. The germen afterward becomes an oblong seed, crowned with hairs, which ripens in the empalement.

The Species are,

1. XERANTHEMUM foliis lanceolatis patentibus. *Lin. Sp. Plant. 857.* Eternal-flower with spreading spear-shaped leaves; commonly called Parmica.

2. XERANTHEMUM foliis lineari-lanceolatis utrinque tomentosis. Eternal-flower with linear spear-shaped leaves, which are downy on their under side.

3. XERANTHEMUM foliis lineari lanceolatis, capitulis cylindraceis, semine maximo. Eternal flower with linear spear-shaped leaves, cylindrical heads, and a very large seed.

4. XERANTHEMUM fruticosum erectum, foliis lanceolatis, ramis unifloris subnudis. *Lin. Sp. Plant. 858.* Shrubby erect Eternal flower with spear-shaped leaves, and almost naked branches bearing one flower.

5. XERANTHEMUM caulibus frutescentibus provolutis, foliis tomentosis recurvatis. *Lin. Sp. Plant. 858.* Eternal flower with shrubby trailing stalks, and downy recurved leaves.

6. XERANTHEMUM ramis unifloris imbricatis, foliis obsolete. *Lin. Sp. Plant. 859.* Eternal-flower with branches terminated by one imbricated flower, and obsolete leaves.

The first sort grows naturally in *Austria*, and some parts of *Italy*, but has been long cultivated in the *English* gardens for ornament. Of this there are the following varieties; one with a large single white flower; the purple and white with double flowers, though these only differ in the colour and multiplicity of petals in their flowers, so are not mentioned

tioned as distinct species, yet where their seeds are carefully saved separate, they are generally constant.

These plants are annual; they have a slender, furrowed, angular, branching stalk, covered with a white down, rising two feet high, garnished with spear-shaped hoary leaves, sitting close to the stalk, which divides into four or five branches, garnished with a few leaves at their lower parts, of the same shape with the other, but less. The upper part of the branches is naked, and sustains one flower at the top, composed of several female and hermaphrodite florets, included in one common scaly empalement, of a silvery colour. The florets are succeeded by oblong seeds, crowned with hairs. The petals of these flowers are dry, so if they are gathered when perfectly dry, and kept from the air, they will retain their beauty a long time.

The second sort grows naturally in *Italy*. The stalks of this do not rise much more than a foot high, and do not branch so much as the former. The leaves are narrower, and the whole plant very hoary. The flowers are not half so large as those of the former, and the scales of their empalements are very neat and silvery.

The third sort grows naturally in the *Levant*; this rises about the same height as the first sort. The leaves are narrower, and are placed closer on the stalks to the top. In other respects the plants are very like, but the flowers are much less, of a paler purple colour, and have a cylindrical empalement. The seeds are very large, and seldom more than three or four in each head.

These flowers were formerly much more cultivated in the *English* gardens than at present, especially the two sorts with double flowers, which the gardeners near *London* propagated in great plenty for their flowers, which they brought to market in the winter season, to adorn rooms, to supply the place of other flowers, which are not easy to be procured at that season; for these being gathered when they are fully blown, and carefully dried, will continue fresh and beautiful many months; but as there are no other colours in these flowers but white and purple, the gardeners had a method of dipping them into various tinctures, so as to have some of a fine blue, others scarlet, and some red, which made a pretty variety; and, if they were rightly stained, and afterwards hung up till they were thorough dry, they would continue their colours as long as the flowers lasted. The stalks of the flowers were not set in water, but the pots or glasses were half filled with dry sand, into which the stalks were placed, and in these they would continue in beauty the whole winter.

These plants are propagated by seeds, which may be sown either in the spring or autumn on a border of light earth; but the latter season is preferable, for those plants which come up in autumn will flower sooner. The flowers will be doubler and much larger than those which are sown in the spring, and from these good seeds may be always obtained; whereas the spring plants many times fail in cold years, and in hot dry seasons the plants do not grow to any size.

When the plants come up, and are about two inches high, they should be pricked out into another border under a warm wall, pale, or hedge, at about four or five inches distance from each other, where the plants will endure the cold of our ordinary winters very well, and in the spring will require no farther care but to keep them clear from weeds, for they may remain in the same place for good. In *June* they will begin to flower, and the middle or latter end of *July* they will be fit to gather for drying; but a few of the best and most double flowers of each kind should be suffered to remain for seed, which, in about six weeks or two months time, will be ripe, and the plants will perish soon after; so that the seeds must be annually sown, in order to preserve the kinds.

The fourth sort grows naturally at the *Cape of Good Hope*. This rises with a shrubby stalk three or four feet high, dividing into four or five branches, whose lower parts are garnished with thick-pointed leaves on their under side, and are ranged without order. The upper part of the branches are naked, and are terminated by one large yellow flower, composed of many oblong acute-pointed rays in the border, and the middle or disk, which is prominent, is made up of hermaphrodite florets, which are of a splendid yellow colour.

The fifth sort grows naturally at the *Cape of Good Hope*. The stalks of this sort are very slender, ligneous, and trail upon the ground, garnished with small silvery leaves placed without order, which sit close to the stalks, and are reflexed. The flowers are produced from the wings of the branches, sometimes one, and at others two or three flowers arise at the same point; these have scaly empalements; their border or rays are composed of many female florets, of a white colour, and their middle of hermaphrodite florets; these are succeeded by oblong seeds crowned with hairs.

The sixth sort is a native of the country near the *Cape of Good Hope*; this has a shrubby branching stalk, which rises three or four feet high. The branches are slender, and like those of the *Spanish Broom*, but hoary; these have very small leaves resembling scales, which sit close to the branches; they are hoary, ending in acute points. The stalks are each terminated by one large silvery flower, having a stiff, dry, scaly empalement. The rays of the flower are composed of many dry female florets, and the disk or middle is made up of hermaphrodite florets.

As these plants do not ripen their seeds in *England*, they are propagated by cuttings, which, if planted on a bed of light earth, during any of the summer months, and shaded from the sun, will put out roots. When these have gotten sufficient roots, they should be carefully taken up, and planted into separate pots, and placed in the shade till they have taken fresh root; then they may be removed to a sheltered situation, where they may have more sun; and here they may remain till autumn, when they must be removed into shelter, for they are too tender to live abroad through the winter in *England*, though they do not require any artificial warmth. I have kept these plants in a common hot-bed frame all winter, exposing them always to the open air in mild weather, but covering them in frost; and these plants have been stronger, and have flowered better than those which were placed in the green-house; so that I would recommend this method of treatment as the best, for the plants are apt to draw up weak in a green-house, and that prevents their flowering; nor are the plants near so handsome as those which are more exposed to the open air.

In the summer time they should be placed abroad in a sheltered situation with other hardy exotick plants, and in dry weather they will require to be often watered, for they are pretty thirsty plants, but in winter it should be sparingly given to them. As these plants are not of long duration, there should be young plants propagated to succeed them, for if they live four or five years, it is full long enough, because after that age they become unsightly.

XIMENIA. *Plum. Gen. Nov. 6. tab. 21.*

The Characters are,

The flower has a small empalement of three leaves, which falls off; it has one bell-shaped petal, cut into three segments at the top, which turn backward; it has three short awl-shaped stamina, terminated by single summits, and a small oval germen, situated under the flower, supporting a very short style, crowned by a beaded stigma. The germen afterward turns to an oval fleshy berry, including an oval nut with one cell, containing one seed of the same form.

The Species are,

1. *XIMENIA foliis solitariis*. *Lin. Sp. Plant.* 1193. *Ximonia* with single leaves.

2. *XIMENIA foliis geminis*. *Lin. Sp. Plant.* 1194. *Ximonia* with twin leaves.

The first sort grows naturally in the islands of the *West-Indies*; it rises with a woody stalk twenty feet high, sending out several branches, which are armed with thorns, garnished with spear-shaped leaves, standing round the branches without order. The flowers are produced at the end of the branches; they have one bell-shaped petal cut almost to the bottom into three segments, which are rolled backward, and are hairy; within they are of a yellow colour, and are succeeded by an oblong, oval, fleshy fruit, shaped like a Plum, including a hard nut of the same form.

The second sort grows naturally in *Egypt*, where it becomes a tree of middling size. The stem is large and woody; the branches are slender and stiff; they have a green bark, and are armed with strong spines; the leaves come out by pairs; they are larger than those of the Box-tree, and end in points, but are of the like consistence and colour. The flowers come out on the side of the branches; they are shaped like those of Hyacinth, but are small, and of a white colour; these are succeeded by oblong black berries, including an oval nut, having one kernel or seed.

Both these sorts are propagated by seeds, which must be procured from the countries where they grow naturally; these should be sown in pots filled with light earth, and plunged into a hot-bed of tanners bark. If the seeds are fresh, the plants will appear in six weeks or two months. When these are about three inches high, they must be each carefully transplanted into a separate small pot filled with light earth, and plunged into a good hot-bed of tanners bark, where they must be shaded from the sun till they have taken new root; then they must be treated in the same manner as other tender plants from the warm countries. During the first summer they may be kept in the tan-bed under frames, where they will thrive better than in the stove; but in autumn, when the nights grow cool, they should be removed into the stove, and plunged into the tan-bed; and in this they should always be kept, observing to shift them into larger pots when they require it; and in summer, when the season is warm, they should have a large share of free air admitted to them. With this management the plants will thrive well, but they cannot be expected to flower very soon in this country.

XIPHION, or *XIPHIUM*. *Tourn. Inst. R. H.* 362. *tab.* 189. Bulbous Iris, or Flower-de-luce.

The Characters are,

The flowers have each a permanent spatha or sheath; they have six petals, the three outer broad, obtuse, and reflexed, and the inner erect, pointed, and joined to the other at their base; they have three awl-shaped stamina, which lie upon the reflexed petals, and are terminated by oblong depressed summits, and an oblong germen under the flower, supporting a short style, crowned by a tripartite stigma. The germen afterward becomes an oblong angular capsule with three cells, filled with roundish seeds.

The Species are,

1. *XIPHIUM foliis carinatis caule longioribus*. Bulbous Iris with keel-shaped leaves, which are longer than the stalk; *Persian* Iris.

2. *XIPHIUM foliis subulato-canaliculatis, caule brevioribus*. Bulbous Iris with channelled awl-shaped leaves, which are shorter than the stalk; Bulbous Iris with a blue Violet flower.

3. *XIPHIUM foliis subulato-canaliculatis, floribus majoribus*. Bulbous Iris with channelled awl-shaped leaves, and larger flowers; or broad-leaved Bulbous Iris.

4. *XIPHIUM foliis planis caule longioribus*. Bulbous Iris with plain leaves, which are longer than the stalk; or broad-leaved Bulbous Iris with a blue flower.

The first sort grows naturally in *Persia*, but has been many years cultivated in the *English* gardens for the beauty of its flowers; it has an oval bulbous root, from which come out five or six pale green leaves, which are hollowed like the keel of a boat, ending in points. Between these the flower-stalk arises, which is seldom above three inches high, supporting one or two flowers, which are included in spathæ (or sheaths); these have three erect petals called standards, which are of a pale sky-blue colour, and three reflexed petals called falls, which on their outside are of the same colour, but the lip has a yellow streak running through the middle, and on each side are many dark spots, with one large deep purple spot at the bottom. These flowers have a very fragrant scent, and generally appear in *February*, which renders them more valuable.

The second sort grows naturally in the warm parts of *Europe*. There are several varieties of this species; the most common sort is blue, but there is one with a yellow, and another with a white flower; one with a blue flower, having white falls, another with yellow falls, one with a Violet-coloured flower, having blue falls, with some others; but these are all supposed to be varieties, which have been produced by culture.

The root of this is bulbous; the leaves are hollow or channelled, ending in points, where their two sides meet; these are not so long as the flower-stalk, which rises between them, and is embraced by the base of the leaves. This supports two or three flowers, which are each inclosed in a separate sheath at the top of the stalk. The flowers are shaped like those of the first sort, but differ in their colour.

The third sort has much larger bulbous roots than either of the former. The leaves are shaped like those of the second sort, but are much larger; the flower-stalk is near twice the height of the second sort, and the flowers are more than double their size. This is by some supposed to be only a variety of the second, but I think it a distinct species, for I have many years raised a great number of the plants from seed, and have never found a single one degenerated to the second sort, and have raised many of the second sort from seeds, without one instance of a plant improving to the third.

There is a great variety of this species, which differ in the colours of their flowers. Some are of a deep blue, others of a light or sky-blue, some of a deep purple, and others with fine variegated flowers, which make a fine appearance during their continuance, which is not long, unless the season proves cold, or the flowers are shaded from the sun.

The fourth sort grows naturally in *Spain* and *Portugal*. The root of this has a dark-coloured coat, but is white within, and of a sweet taste. The leaves are eight or nine inches long, and more than an inch broad at their base; they are almost plain, but toward their base are hollowed like the keel of a boat, and end in points, being of a pale green on their upper side, and a little hoary on their under. The flowers stand upon naked foot-stalks, which arise from the root, and grow five or six inches high, sustaining two or three flowers at the top, which are each wrapped up in a separate sheath; these are shaped like those of the other sorts, and have a very agreeable odour.

There are four or five varieties of this species, which differ in the colour of their flowers; but the most common colour is blue.

They are all propagated by offsets from their roots, but to obtain new varieties, they must be propagated by seeds in the following manner.

Having

Having procured a parcel of seeds from good flowers, you should provide some flat pans or boxes, which must have holes in their bottoms to let the moisture pass off; these should have pieces of tile or oyster-shells laid over each hole to prevent their being stopped; then they must be filled with fresh, light, sandy earth, and the beginning of *September* the seeds should be sown thereon pretty thick, observing to scatter them as equally as possible; then cover them over about half an inch thick with the same light fresh earth, and place the boxes or pans where they may have the morning sun till eleven o'clock; and if the season should prove very dry, they must be now and then refreshed with water.

In this situation they may remain until the middle of *October*, when they should be removed into a warmer situation, where they may have the full sun most part of the day, and screened from severe frosts; in which place they must abide all the winter, observing to keep them clear from weeds and moss, which, at this season, are very apt to spread over the surface of the earth, in tubs, pans, or pots, when they are exposed to the open air.

In the spring the plants will appear above ground, when, if the season is dry, they must be now and then refreshed with water, and constantly kept clear from weeds; and as the season advances, and the weather becomes warm, they should be again removed into their former shady situation, where they may enjoy the morning sun only. When the leaves begin to decay (which will be in *June*), they must be cleared from weeds and dead leaves, and some fresh earth sifted over them about half an inch thick, still suffering them to abide in the same situation all the summer season; during which time they will require no farther care, but to keep them clear from weeds, until the beginning of *October*, when they must be again removed into a warm situation, and the surface of the earth lightly taken off, and some fresh earth sifted over them.

In this place they must remain all the winter, as before; and in the spring they must be treated as was directed for the former years.

When the leaves are decayed, the bulbs should be carefully taken up (which may be best done by sifting the earth through a fine sieve), and a bed or two of good light fresh earth should be prepared, into which the bulbs must be planted, at about three inches asunder each way, and three inches deep. These beds must be constantly kept clean from weeds and moss; and if the winter should prove severe, the bed should be covered with rotten tanners bark, or Pease haulm, to keep out the frost; and in the spring, just before the plants come up, the surface of the beds should be stirred, and some fresh earth sifted over them about half an inch thick, which will greatly strengthen the roots.

During the spring and summer, they must be constantly weeded; and at *Michaelmas* the earth should be again stirred, and some fresh sifted over the beds again, as before, observing in winter and spring still to keep the beds clean, which is the whole management they will require, and in

June following the greatest part of the roots will flower; at which time you should carefully look over them, and put down a stick by all those whose flowers are beautiful, to mark them; and as soon as their leaves are decayed, these roots may be taken up to plant in the flower-garden amongst other choice sorts.

But the nursery-beds should still remain, observing to keep them clear from weeds, as also to sift fresh earth over them, as was before directed; and the following season the remaining part of the roots, which did not flower the foregoing season, will now shew their blossoms; so that you may know which of them are worth preserving in the flower-garden, which should now be marked; and when their leaves are decayed, they must be taken up and planted with the other fine sorts, in an east-border of light fresh earth; but the ordinary sorts may be intermixed with other bulbous-rooted flowers in the larger borders of the pleasure-garden, where, during their continuance in flower, they will afford an agreeable variety.

But after these choice flowers are obtained from seeds, they may be increased by offsets, as other bulbous flowers are. The offsets should be planted in a separate border from the blowing roots, for one year, until they have strength enough to produce flowers, when they may be placed in the flower-garden with the old roots.

These bulbs need not be taken up oftener than every other year, which should always be done soon after their leaves decay, otherwise they will send forth fresh fibres, when it will be too late to remove them; nor should they be kept long out of the ground; two months is full enough; for when they are kept longer, their bulbs are subject to shrink, which causes their flowers to be weak the following year.

The *Persian Iris* is greatly esteemed for the beauty and extreme sweetness of its flowers, as also for its early appearance in the spring, it generally being in perfection in *February*, or the beginning of *March*, according to the forwardness of the season, at which time there are few other plants in beauty.

This may be propagated by seeds in the same manner as the other sorts; but the boxes in which they are sown, should be put under a garden-frame in winter, to shelter them from hard frost, because, while the plants are young, they are somewhat tender. From the seeds of this kind I could never obtain any varieties, their flowers being always the same.

These plants are also propagated by offsets, in the same manner as the other sorts; but their roots should not be transplanted oftener than every third year; nor should they be ever kept out of the ground long, because their roots will shrink and entirely decay when they are long above ground, so as not to be recovered again. This sort was formerly more common in the gardens near *London* than at present, which, I suppose, has been occasioned by the keeping the roots above ground too long, which destroyed them.

XYLON. See Bombax.

Y.

Y U C

YEW-TREE. See *Taxus*.
YUCCA. *Dillen. Gen. Nov. 5.* The Indian
Yucca, or *Adam's Needle*.

The Characters are,

The flower has no empalement; it is bell-shaped, composed of six large petals, whose tails are joined, and six short reflexed stamina, terminated by small summits, and an oblong three-cornered germen, which is longer than the stamina, having no style, crowned by an obtuse stigma with three furrows. The germen afterward turns to an oblong three-cornered capsule, divided into three cells, filled with compressed seeds, lying over each other in a double arrangement.

The Species are,

1. *YUCCA foliis integerrimis.* *Vir. Cliff. 29.* *Yucca* with entire leaves; commonly called *Adam's Needle*.

2. *YUCCA foliis crenulatis strictis.* *Lin. Sp. Plant. 319.* *Yucca* with narrow leaves, which are slightly crenated.

3. *YUCCA foliis crenatis nutantibus.* *Lin. Sp. Plant. 319.* *Yucca* with nodding crenated leaves.

4. *YUCCA foliis serrato-filamentosis.* *Lin. Sp. Plant. 319.* *Yucca* with sawed thready leaves.

The first of these plants is a native of *Virginia* and other parts of *North America*.

This sort seldom rises with a stem above two feet high, which is garnished with leaves almost to the ground. The leaves are broad, stiff, and have the appearance of those of the *Aloe*, but are narrower, of a dark green colour, ending in a sharp black spine. The plants frequently produce spikes of flowers, which rise from the center of the leaves. The stalks grow three feet high, branch out to a considerable distance, but the flowers are placed very sparsely on the branches, which renders it less beautiful than the flowers of the other kinds; they are white within, but each petal is marked with a purple stripe on the outside, bell-shaped, and hang downward.

The second sort rises with a thick, tough, fleshy stalk to the height of ten or twelve feet, having a head or tuft of leaves at the top; these are narrower and stiffer than those of the former sort, and are of a lighter green colour; their edges are slightly sawed, and their points end with sharp thorns. The flower-stalk rises in the center of the leaves, and is from two to three feet long, branching into a pyramidal form. The flowers grow close on the branches, and form a regular spike; they are of a bright purple colour on the outside, and white within, making a fine appearance. The plants of this do not flower so often as the other sort; and when they flower, the head decays, but one or two young heads come out from the side of the stalk, below the old one.

The third sort grows naturally in *South Carolina*. The stalks of this sort rise about three or four feet high; the

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leaves are narrow, of a dark green colour, and hang downward; they are sawed on their edges, and end in acute spines. I never saw the flowers of this sort, but have been informed they are white.

The threaded sort is not so common as the others in the *English* gardens; but as it is a native of *Virginia*, it might easily be procured in plenty from thence. The stalk and leaves are like those of the first sort, but the leaves are obtuse, and have no spine at their ends. From the side of the leaves come out long threads, which curl and hang down.

All these plants are either propagated by seed, when obtained from abroad, or else from offsets or heads taken from the old plants, after the manner of *Aloes*.

When they are raised from seeds, they should be sown in pots, and plunged into a moderate hot-bed, where the plants will come up in five or six weeks after; and when they are two or three inches high, they should be transplanted each into a separate small pot, and plunged into the hot bed, where the plants should have air and water in proportion to the warmth of the season, and the bed wherein they are placed.

In *June* they should be inured, by degrees, to bear the open air; into which they must be removed, to harden them before winter, placing them in a well-sheltered situation, where they may remain until the beginning of *October*, when they must be removed into the green-house, where they may be arranged amongst the hardier sorts of *Aloes*, and should be treated in the same manner as hath been already directed for them; to which the reader is desired to turn for further instructions.

When these plants have acquired strength, those of the common sort, and also the threaded, may be afterwards turned out into a warm border, where they will endure the cold of our ordinary winters very well; but the other sorts must be kept in pots, that they may be sheltered in winter; and if they are treated in the same way as the large *American Aloe*, they will thrive very well.

The offsets taken from the old plants should be laid in a dry place, for a week or ten days before they are planted, that their wounds may heal, otherwise they will be subject to rot with moisture.

As the second and third sorts do not put out offsets so plentifully as the first, in order to propagate them, the heads of the plants may be cut off in *June*; and after the wounded part is dry, the heads may be planted, which will soon take root, provided the pots are plunged into a moderate hot-bed; and this cutting off the heads will occasion the stems to put out suckers, which they seldom do without until they flower; so that by this method the plants may be obtained in plenty.

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Z E A

ZANTHOXYLUM. See Xanthoxylum.

ZEA. Lin. Gen. Plant. 926. Turkey Corn.

The Characters are,

It has male and female flowers situated at remote distances on the same plant. The male flowers are disposed in a loose spike, having oval, oblong, chaffy empalements, opening with two valves, each inclosing two flowers; these have two short compressed nectariums, and three hair-like stamina, terminated by quadrangular summits, which open in four cells at the top. The female flowers, which are situated below the male, are disposed in a thick spike, inclosed with leaves; these have thick chaffy empalements with two valves. The flowers are composed of two short membranaceous broad valves, which are permanent, and a small germen with a slender style, crowned by a single stigma, which is hairy toward the point. The germen afterward turns to a roundish compressed seed, angular at the base, and half inclosed in its proper receptacle.

The Species are,

1. ZEA caule altissimâ, foliis latioribus pendulis, spicâ longissimâ. Indian Corn with the tallest stalk, broader hanging leaves, and the longest spike.

2. ZEA caule graciliore, foliis carinatis pendulis, spicâ longâ gracili. Indian Corn with slenderer stalks, keel-shaped hanging leaves, and a long slender spike.

3. ZEA caule humiliori, foliis carinatis pendulis, spicâ breviori. Indian Corn with a lower stalk, hanging keel-shaped leaves, and a shorter spike.

These three species have been generally supposed but one, and only accidental variations; but from long experience I can affirm, they are different, and do not alter by culture.

The first sort grows naturally in the islands of the West-Indies; this hath a very large strong stalk, which rises to the height of ten or twelve feet. The leaves are long, broad, and hang downward; they have a broad white midrib. The male flowers come out in branching spikes at the upper part of the stalks; these are eight or ten inches long. The female flowers come out from the bottom of the leaves on the side of the stalk; they are disposed in a close, long, thick spike, and are covered closely with thin leaves; out of the end of the covers hang a small long bunch of filaments or threads, which are supposed to receive and convey the farina of the male flowers to the germen of the female. When the seeds of this sort are ripe, the spikes or ears are nine or ten inches long, and sometimes a foot; but these rarely ripen in England.

I have not seen any variety of colours in this species, though it is very probable there are the same varieties in the colour of the grain, as in the other species; but as this is less common in Europe, we are not so well acquainted with it.

The second sort is cultivated in Italy, Spain, and Portugal. The stalks of this sort are slenderer than those of the former, and seldom rise more than six or seven feet high. The leaves are narrower than those of the first sort, and are hollowed like the keel of a boat, and their tops hang downwards. The spikes of male flowers are shorter than those of the first, and the ears or spikes of grain are slenderer,

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and not more than six or seven inches long. The grains of this sort do not come to maturity in England, unless the season proves very warm; and the grains are planted early in a warm soil and situation.

The third sort is cultivated in the northern parts of America, and also in Germany. The stalks of this are slender, and seldom rise more than four feet high. The leaves are shorter and narrower than those of the two former; they are hollowed like the keel of a boat, and their tops hang down. The spikes of male flowers are short, and the ears or spikes of grain are seldom more than four or five inches long. This sort ripens its grain perfectly well in England, in as little time as Barley, so may be cultivated here to advantage.

There are several varieties of the two last species, which differ in the colour of their grain. The most common colour is that of a yellowish white; but there are some with deep yellow, others with purple, and some with blue grains; and when the different colours are planted near each other, the farina will mix, and the ears will have grains of several colours intermixed; but when the grains of the different varieties are planted at a proper distance from each other, the produce will be the same with the grains which were sown.

These plants are seldom cultivated in England for use, but in Italy and Germany it is the food of the poor inhabitants; as it is also in many parts of North America, where it is treated in the following manner:

They first dig the ground well in the spring, and after having made it level, they draw a line across the whole piece intended to be planted; then they raise little hills at about three or four feet distance, into each of which they put two or three good seeds, covering them about an inch thick with earth; then they move the line four feet farther, continuing to do the same through the whole spot of ground; so that the rows may be four feet asunder, and the hills three or four feet distance. Six quarts of this seed is generally allowed to an acre of land, which, if the soil be good, will commonly produce fifty bushels of Corn.

In the planting of this Corn, where they observe to plant the grain of any one colour in a field by itself, and no other coloured grain stand near it, it will produce all of the same colour again, as hath been affirmed by many curious persons who have tried the experiment; but, if the rows are alternately planted with the grain of different colours, they will interchange, and produce a mixture of all the sorts in the same row, and frequently on one and the same spike; and some do affirm they will mix with each other, at the distance of four or five rods, provided there is no tall fence or building between to intercept them.

There is nothing more observed in the culture of this grain, but only to keep it clear from weeds, by frequent hoeing of the ground; and when the stems are advanced, to draw the earth up in a hill about each plant, which, if done, will greatly strengthen them, and preserve the ground about their roots moist for a considerable time.

When

When the Corn is ripe, they cut off the stalks close to the ground, and after having gathered off the spikes of grain, they spread the stalks in the sun, to harden and dry, which they afterward use in the same manner as Reeds in *England* for making fences, covering sheds, &c. for which purpose they are very useful to the inhabitants of warm countries; and when there is a scarcity of forage, they feed their cattle with them green, as fast as the Corn is gathered off.

The Corn is ground to flour, and the poorest sort of people in *America*, and also in *Italy* and *Germany*, make their bread of this flour; and in many of the warmer countries, the inhabitants roast the whole spikes, and dress them many different ways, making several dishes of it; but this grain seldom agrees with those who have not been accustomed to eat it; however, in times of scarcity of other grain, this would be a better substitute for the poor than Bean-flour, or other sorts, which have been used in *England*, and at all times will be found a hearty food for cattle, hogs, and poultry; so that in light sandy lands, where Beans and Peas succeed not well, this grain may be cultivated to answer both purposes to advantage.

If this grain is cultivated by the horse-hoeing husbandry, it may be done at less expence than in any other method; for this is one of the plants which is more particularly adapted to this husbandry.

The time for sowing this Corn, is about the same as for Barley; in light warm land it may be sown the latter end of *March* or the beginning of *April*, but in cold ground the middle or end of *April* will be early enough, for the grain is subject to rot in cold land, especially if the season proves wet. When the large sorts are planted in a garden for curiosity, their seeds should be sown upon a moderate hot-bed the beginning of *March*; and when the plants are fit to remove, they should be transplanted on another moderate hot-bed to bring them forward; but they must not be kept too closely covered, for that will draw them up weak; therefore, when the weather is mild, they should be inured to bear the open air; and the middle of *May*, they should be taken up with balls of earth to their roots, and transplanted into a warm border at three or four feet distance, carefully watering them if the weather proves dry, until they have taken new root; after which they will require no other care but to keep them clean from weeds. If the season should prove warm, these plants will ripen the Corn late in autumn.

ZINNIA. *Lin. Gen. Plant.* 1161.

The Characters are,

The common empalement of the flower is imbricated with scales, and permanent, of a cylindrical oval form. The flower is composed of several funnel-shaped hermaphrodite florets, having each five short stamina, whose summits coalesce; the ray is composed of several large, spreading, female, half florets, which are permanent. The hermaphrodite florets have an oblong bearded germen with a slender style, crowned by two short reflexed stigmas; these florets are succeeded by oblong single seeds with two horns, which ripen in the empalement.

The Species are,

1. ZINNIA foliis oblongis oppositis sessilibus, calycibus ovato-cylindricis, radii plurimis dentatis. Zinnia with oblong leaves sitting close to the stalk opposite, an oval cylindrical flower-cup, and many indented rays to the flower.

2. ZINNIA caule erecto hirsuto, foliis ovato-lanceolatis sessilibus, floribus terminalibus. Zinnia with an erect hairy stalk, oval spear-shaped leaves sitting close to the stalk, which is terminated by a flower.

The first sort grows naturally in *Peru*; it is an annual plant, which rises from two to four feet high; the lower part of the stalk becomes ligneous in autumn. The branches come out opposite, and are garnished with oblong leaves,

which vary both in form and size: some are broad at their base, and terminate in acute points; others are of an oblong oval; they are smooth without foot-stalks, and placed opposite. The flowers are produced singly upon pretty long foot-stalks, most of them terminating the branches; but sometimes they rise from the division of the branches. The empalement of the flower is of a cylindrical form, composed of scales, lying over each other imbricated, closely inclosing several hermaphrodite florets, which form the disk, surrounded by half florets or rays, which are large, spread open, and of unequal number: in some flowers there are but five, in others ten or more, of a yellow colour, but afterward change to a brown, remaining till the seeds are ripe.

The second sort grows naturally in *Louisiana*; this is also an annual plant. The stalk is more erect than that of the former, as are also the branches; they are covered with soft hairs, and are channelled; the leaves are placed opposite; they are oval, spear-shaped, having three longitudinal veins, and are hairy. The flowers terminate the branches; the ray or border, which is composed of female half florets, spread open, and are of a deep gold colour on the upper side when first open, but afterward change to a dark copper, but on the backside of a pale straw colour. The florets which compose the disk are tubulous, and have five stamina stretched out beyond the corolla, whose summits which are yellow are connected; the half florets which compose the border or ray are permanent, remaining till the seeds are ripe, which are of the same structure with those of the former sort.

Both these plants are propagated by seeds, which must be sown upon a moderate hot-bed in *March*. When the plants come up, they must have air admitted to them by tilting of the lights of the bed every day when the weather is not too cold, otherwise the plants will draw up weak: when the plants are about an inch high, they should be planted on another hot-bed to bring them forward; but they should not be treated too tenderly, for they are very subject to grow too luxuriant in branches; and the first sort will not produce many flowers, if the plants are not stunted in their growth while young, which may be effected by planting them in small pots to confine their roots, otherwise the seeds will not ripen in *England*.

The second sort is much more prolific of flowers than the first, so may be treated with less care: these, when they have been brought forward on the hot bed, may be inured gradually to bear the open air in *May*, and in *June* should be transplanted into the borders of the flower-garden, where they will continue flowering all the summer, and will perfect their seeds very well; but the plants of the first sort should be placed either in the stove or a glass-case to obtain good seeds.

ZIZIPHORA. *Lin. Gen. Plant.* 33. Field Basil.

The Characters are,

The flower hath a long, rough, cylindrical empalement, which is slightly cut into five parts at the brim. The flower is of the labiated kind, having a long cylindrical tube. The upper lip is oval, reflexed, and entire; the under lip (or beard) is divided into three equal segments; it has two spreading stamina, terminated by oblong summits, and a quadrifid germen, supporting a bristly style, crowned by a sharp-pointed inflexed stigma. The germen afterward turns to four oblong seeds, which ripen in the empalement.

The Species are,

1. ZIZIPHORA capitulis terminalibus, foliis ovatis. *Lin. Sp. Plant.* 21. Field Basil with heads terminating the stalks, and oval leaves.

2. ZIZIPHORA floribus lateralibus, foliis lanceolatis. *Lin. Sp. Plant.* 21. Field Basil with flowers growing on the sides of the stalk, and spear-shaped leaves.

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3. *ZIZIPHORA foliis lanceolatis, floribus terminalibus.* Hort. Cliff. 305. Field Basil with spear-shaped leaves, and flowers terminating the stalks.

The first sort grows naturally in *Virginia*; this is an annual plant, which has a four-cornered stalk, sending out side branches, which stand opposite; these are terminated by a cluster of small flowers, surrounded by oval leaves, ending in acute points. The flowers have a slender cylindrical empalement, out of which they just peep; they are purple, of the lip kind, and have but two stamina.

The second sort grows naturally in the *Levant*; this sends up many slender ligneous branches, which rise near a foot high, garnished with spear-shaped leaves, about the size of those of Summer Savory, and have a scent like them. The flowers are produced in whorls round the stalks, which are like those of the former sort.

The third sort grows naturally on the *Alps* and *Appennine* mountains. The stalks of this rise about six inches high, garnished with small spear-shaped leaves placed opposite. The flowers are produced in a cluster at the top of the stalks, which are of the same shape and colour as those of the first sort, and are surrounded with spear-shaped leaves.

These plants are all of them annual, so are propagated only by seeds.

The seeds may be sown in a border of light earth, either in spring or autumn. Those plants which come up in autumn, will abide through the winter, and will grow much larger than those which come up in the spring; though neither of them rise very high. The seeds should be sown where the plants are to remain; for they do not thrive well when they are transplanted, unless the earth remains to their roots. These have a pretty strong aromack scent, somewhat resembling Summer Savory; but as they are plants of little beauty, they are seldom cultivated but in botanick gardens for sake of variety.

The seeds of those plants which come up in autumn, will be ripe in *July* or *August*; but those of the spring plants will not ripen till the latter end of *August*, or the beginning of *September*, when, if the seeds are permitted to scatter, the plants will come up, and require no farther care, but to clear them from weeds, and thin them where they are too close.

ZIZIPHUS. Tourn. Inst. R. H. 627: tab. 433. *Rhamnus.* Lin. Gen. Plant. 235. The Jujube.

The Characters are,

The flower has no empalement; it has one funnel-shaped petal, which spreads open at the top, and is cut into four or five segments; it has five awl-shaped stamina, whose base are inserted to the petal, and are terminated by small summits, and an oval germen, supporting two slender styles, crowned by obtuse stigmas. The germen afterward becomes an oblong oval berry, inclosing a single nut of the same form, which has two cells, each containing an oblong seed.

The Species are,

1. *ZIZIPHUS aculeis geminatis rectis, foliis oblongo-ovatis serratis.* Jujube with strait thorns growing by pairs, and oblong, oval, sawed leaves; or the common Jujube.

2. *ZIZIPHUS aculeis geminatis, altero recurvo, foliis ovatis nervosis.* Jujube with twin spines, one of which is recurved, and oval veined leaves; or the wild Jujube.

3. *ZIZIPHUS aculeis solitariis recurvis, pedunculis, aggregatis, foliis cordato-rotundis nervosis, subtus tomentosis.* Jujube with single recurved spines, foot-stalks in clusters, and round heart-shaped veined leaves, which are downy on their under side.

4. *ZIZIPHUS aculeis geminatis rectis, foliis ovatis nervosis.* Jujube with double strait thorns, and oval veined leaves.

The first sort grows naturally in the warm parts of *Europe*; it has a woody stalk, which divides into many crooked

irregular branches, which are armed with strong strait thorns set by pairs at each joint. The leaves are two inches long and one broad, slightly sawed on their edges, and stand upon short foot-stalks. The flowers are produced on the side of the branches, two or three arising from the same place, which sit close; they are small, and of a yellow colour; these are succeeded by an oval fruit, about the size of a middling Plum, of a sweetish taste, and are clammy, including a hard oblong stone, pointed at both ends.

The fruit of this tree was formerly used in medicine; it is reckoned pectoral, and good for coughs, pleurisies, and hot sharp humours, but is now seldom to be found in the shops. In *Italy* and *Spain*, this fruit is served up at the table in deserts during the winter season, as a dry sweetmeat.

The second sort grows naturally about *Tunis* in *Africa*; this has slender woody stalks, which send out many weak branches, covered with a grayish bark, and armed with spines, which come out by pairs at each joint, one of which is longer than the other, and is strait; the other is short and recurved. The leaves are small, oval, and veined; they are half an inch long, and as much in breadth, sitting close to the branches. The flowers of this sort I have not seen, so can give no farther description of this plant.

The third sort grows naturally in *India*; this rises with shrubby stalks ten or twelve feet high, sending out many slender branches, which have a yellowish bark, and are armed with single recurved thorns at each joint. The leaves are round, heart-shaped, about two inches long, and as much in breadth, and are indented at the foot-stalk; they have three longitudinal veins, and are covered with a yellowish down on their under side. The flowers come out in clusters from the wings of the branches; they are small, and of a yellowish colour; these are succeeded by oval fruit about the size of small Olives, inclosing a stone of the same shape.

The fourth sort grows naturally in *Syria*, from whence I have received the seeds; this sends up several shrubby stalks from the root, which divide into slender branches; these are armed with strait spines, which are set by pairs at each joint. The leaves are small, oval, and veined, and are placed alternate, standing upon very short foot-stalks. The flowers are small, of a yellow colour, arising at the wings of the branches. The fruit is round, and about the size of Sloes.

These plants are preserved in the gardens of some curious persons only for the sake of variety, for they do not produce fruit in *England*. The first and fourth sorts, which are the most hardy, will scarce live through the winters in *England*, even when they are planted against south walls; in which situation I have kept the plants two or three years, when the winters have proved mild, but they were afterward killed by a sharp frost. They may be propagated by putting their stones into pots of fresh light earth, soon after their fruits are ripe; and in winter they should be placed under a common hot-bed frame, where they may be sheltered from severe frost. In the spring these pots should be plunged into a moderate hot-bed, which will greatly forward the growth of the seeds; and when the plants are come up, they should be inured to the open air by degrees, into which they must be removed in *June*, placing them near the shelter of a hedge; and in very dry weather they must be frequently refreshed with water.

In this situation they may remain till the beginning of *October*, when they must be removed either into the greenhouse, or placed under a hot-bed frame, where they may be defended from frost, but should have as much free air as possible in mild weather.

During the winter season they should be now and then refreshed with water; but after their leaves are fallen (as they

they always shed them in winter), they must not be over watered, which would rot the tender fibres of their roots, and cause the plants to decay.

In *March*, just before the plants begin to shoot, they should be transplanted each into a separate small pot, filled with light fresh earth; and if they are plunged into a moderate hot-bed, it will greatly promote their taking root; but in *May* they must be inured to the open air by degrees, into which they should be soon after removed.

Thus these plants should be managed while young, at which time they are tender; but when they are three or four years old, some of them may be planted in the full ground, against a warm wall or pale, where, if they have a dry soil, they will endure the cold of our ordinary winters pretty well, but in hard frosts they will require to be sheltered, so it will be proper to keep a plant or two in pots, which may be housed in winter.

These plants may be also propagated by suckers, which the old ones many times send forth from their roots; but these are seldom so well rooted as those produced from seeds, nor do they make so good plants, for which reason they are but rarely propagated that way.

The second sort is not so hardy as the first, so these plants must be kept in pots, and in the winter placed into the green-house, and treated in the same way as other hardy exotick plants, being careful not to over-water them at that season, but especially when they have shed their leaves.

This sort is propagated by seeds, which must be procured from the country where it naturally grows; these should be sown in pots filled with light earth, and plunged into a hot-bed of tanners bark, which will bring up the plants in about six weeks, if the seeds are good. When the plants begin to advance in height, they should be gradually hardened, and in *June* they may be placed in the open air in a sheltered situation; but in autumn they must be removed into shelter, where they must remain all the winter; and in the spring, before the plants begin to push out their leaves, they should be carefully transplanted each into a separate small pot, and plunged into a gentle hot-bed to forward their putting out new roots. In summer they must be exposed abroad, but in winter they must be housed.

The third and fourth sorts are tenderer than the former, so will not thrive in this country unless the plants are kept in a warm stove. These are propagated in the same way as the former, but the plants must be more tenderly treated, for they should not be wholly exposed abroad at any time of the year; in summer they must have a large share of air in warm weather, and in winter they must be kept in a warm stove.

ZYGOPHYLLUM. *Lin. Gen. Plant.* 474. *Fabago*. *Tourn. Inst. R. H.* 258. *tab.* 135. Bean Caper.

The Characters are,

The empalement of the flower is composed of five oval obtuse leaves. The flower has five obtuse petals, which are longer than the empalement, and are indented at their points; it has a closed nectarium, which includes the germen, composed of several scales or little leaves, to which the bases of the stamina are fastened; it hath ten awl-shaped stamina, terminated by oblong summits, and an oblong germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterward becomes an oval five-cornered capsule with five cells, containing several roundish seeds.

The Species are,

1. ZYGOPHYLLUM *capsulis prismaticeo-pentandris*. *Hort. Upsal.* 103. Bean Caper with a prismatical capsule and five stamina.

2. ZYGOPHYLLUM *capsulis globoso-depressis*. *Lin. Sp. Plant.* 385. Bean Caper with globular depressed capsules.

3. ZYGOPHYLLUM *capsularum angulis compresso-membra-*

naccis. *Lin. Sp. Plant.* 385. Bean Caper with compressed membranaceous angles to the capsules.

4. ZYGOPHYLLUM *capsulis ovatis acutis*. *Lin. Sp. Plant.* 386. Bean Caper with oval acute-pointed capsules.

The first sort grows naturally in *Syria*; this has been long an inhabitant of some curious gardens in *England*. The root is thick, fleshy, and strikes deep into the ground, and will grow as thick as a man's arm when old. The stalks decay every autumn to the root, from which spring new shoots every year, in number proportional to the size of the root; they rise three or four feet high, sending out a few side branches; these are smooth, green, and jointed; they are garnished with smooth fleshy leaves like those of Purslane, two standing together upon the same foot-stalk, which is an inch long; they are of a bluish green colour. The flowers are produced from the wings of the stalk, two or three arising at the same joint upon short foot-stalks; they are composed of five roundish concave petals, of a reddish colour on their outside, and ten stamina, which are twice the length of the petals. The flowers are succeeded by oblong prismatical capsules with five sides, which have cells filled with roundish seeds. This sort flowers in *June* and *July*, and the seeds ripen in autumn.

The second sort grows naturally at the *Cape of Good Hope*. This rises with a thick woody stalk three or four feet high, sending out many branches, which are garnished with succulent leaves, placed by fours sitting close to them. From the wings of the stalks the flowers are produced upon pretty long slender foot-stalks; they are composed of five sulphur-coloured petals, which have a brown spot on each of their tails; these are succeeded by roundish depressed fruit, having five cells, each containing two roundish seeds. This plant continues flowering all summer and autumn, and the seeds ripen in winter.

The third sort grows naturally at the *Cape of Good Hope*; this has a shrubby stalk, which divides into many irregular jointed branches, which rise four or five feet high, and are garnished with thick succulent leaves, which are larger and more obtuse than those of the second sort; they are placed by fours at each joint, two on each side the stalk opposite. The flowers come out from the wings of the stalk upon slender foot-stalks; these have but four petals, which are broader than those of the second sort, but of the same colour, each having a brown spot at their tails. The fruit has four broad membranaceous wings to it, resembling the sails of a mill. This plant flowers most part of summer, but the fruit seldom ripens well in *England*.

The fourth sort is a native of the *Cape of Good Hope*. The stalks of this branch out greatly from the bottom; they are shrubby, jointed, and irregular. The leaves are of the consistence of those of Purslane; they are narrow at their tails, but oval toward their points, and are placed by fours at each joint like the former. The flowers come out from the wings of the stalk upon slender foot-stalks; they are of a pale yellow colour, each petal having a pretty large red spot at their tails. The fruit is oval, about three quarters of an inch long, having five deep furrows, and is divided into five cells, which are filled with roundish seeds. This plant flowers great part of the year, and the fruit ripens in autumn and winter.

The first sort is propagated only by seeds, which ripen very well in *England* in warm seasons; these may be either sown upon a moderate hot-bed in the spring, or on a warm border of light ground; those which are sown upon the hot-bed will come up in three weeks or a month; and about a month after, the plants will be fit to remove, when they should be each planted in a separate small pot, filled with fresh light earth, and plunged into a gentle hot-bed to promote their taking root, and shaded from the sun in the day time;

time; afterward they must be gradually hardened to bear the open air, to which they should be exposed all the summer; but in autumn, when their stalks begin to decay, they should be placed in a hot-bed frame to shelter them from the frost in winter, for while they are young they are a little tender. The spring following they may be turned out of the pots, and planted in a south border close to the wall, in a dry rubbishy soil, where they will endure the cold without covering. There is a plant of this kind in the *Chelsea* garden, which is near fifty years old, and has resisted the severest cold without any covering, and produces great plenty of flowers and fruit annually.

Those plants which come up in the full ground, will require no other care but to keep them clean from weeds, and thin them where they come up too close, giving them room to grow the first year; and when their stalks decay in autumn, the surface of the ground should be covered with tan to prevent the frost from penetrating to the roots, or in frosty weather, they may be covered with Straw or Peas haulm, which will answer the same purpose; and in the spring, the roots should be carefully taken up, planting them close to a warm wall, as was before directed.

The other three sorts are too tender to live through the winter in the open air in this country, so they must be kept in pots, and housed in autumn. These plants may be propagated either by seeds or cuttings.

The second and fourth sorts ripen their seeds pretty well in *England*, so these may be propagated by sowing them on a moderate hot-bed in the spring; and when the plants are

about an inch high, they should be each transplanted into a small pot filled with light earth, and plunged into a moderate hot-bed, shading them from the sun till they have taken new root; then as the season advances, they should be gradually hardened to bear the open air, into which they should be removed the latter end of *May*, placing them in a warm sheltered situation, where they may remain till autumn, when they should be placed in an airy dry glass-case, where they will succeed better than in a greenhouse; for they require a large share of air in mild weather, otherwise their shoots are apt to be weak and tender, so are often injured by damp air in winter; but they do not require any artificial heat. If they are screened from the frost, and have plenty of air, they will thrive very well.

The third sort seldom produces good seeds in *England*, so is propagated by cuttings, and the two others are generally increased in the gardens the same way, that method being very expeditious, though the seedling plants grow stronger, and rise to a greater height. These cuttings may be planted in a bed of light earth during any of the summer months; if these are covered close down with bell or hand-glasses, and shaded from the sun, they will put out roots in five or six weeks, and then they may be taken up carefully and potted, placing them in the shade till they have taken new root; after which they may be removed to a warm sheltered situation, and treated in the same way as those plants raised from seeds.

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 Aralia
Arbor Camphorifera, see Laurus
Arbor Coral, see Erythrina
Arbor Judæ, see Cercis
Arbor Vitæ, see Thuya
 Arbutus
 Arctium
 Arctotis
 Argemone
Aria Theophrasti, see Cratæ-gus
Arisarum, see Arum
 Aristolochia
 Armeniaca
Armerius, see Dianthus
 Arnica
 Arteria
 Artemisia
 Arum
 Arundo
 Asarina
 Asarum
 Asclepias
 Ascyrum
 Aspalathus
 Asparagus
 Asperugo
 Asperula
 Asphodelus
 Asplenium
 Alter
Asteriscus, see Bupthalmum
Asteroides, see Inula

Astragalus
 Astringia
 Athamanta
 Atractylis
 Atraphaxis
 Atriplex
Atriplex baccifera, see Blitum
 Atropa
 Avena
 Aurantium
 Auricula muris
 Auricula ursi
 Azalea
Azederach, see Melia

B.

BACCHARIS

Balaustia, see Punica
 Ballote
Balsamina, see Impatiens
Balsamita, see Tanacetum
Bamia Moschata, see Hibiscus
Banana, see Musa
 Bannisteria
Baobab, see Adansonia
Barba Capræ, see Spiræa
Barba Jovis, see Anthyllis
Barbarea, see Sifymbrium
Bardana, see Arctium
 Barleria
 Bartramia
 Bassella
Basilicum, see Ocimum
 Bacteria
 Bauhinia
Belladonna, see Atropa
 Bellis
Bellis major, see Chrysanthemum
 Bellonia
Benzoin, see Laurus
 Berberis
Bermudiana, see Sifyrinchium
Bernardia, see Croton
 Bessleria
 Beta
 Betonica
Betonica aquatica, see Scrophularia
Betonica Pauli, see Veronica
 Betula

I N D E X L A T I N U S.

Bidens
Bifolium, see *Ophris*
 Bignonia
 Biscutella
 Bisslerula
Bislingua, see *Ruscus*
 Bistorta
 Bixa
Blattaria, see *Verbascum*
 Blitum
 Bocconia
 Boerhaavia
 Bombax
Bonduc, see *Guilandina*
 Bontia
Bonus Henricus, see *Chenopodium*
 Borbonia
 Borrago
Botrys, see *Chenopodium*
 Brabejum
Branca Ursina, see *Acanthus*
 Brassica
 Breynia
 Bromelia
 Browallia
Brunella, see *Prunella*
 Brunfelsia
Bruscus, see *Ruscus*
 Bryonia
Bryonia nigra, see *Tamus*
 Bubon
 Buddleja
Buglossum, see *Anchusa* & *Lycopsis*
 Bugula
Bulbocastanum, see *Bunium*
 Bulbocodium
 Bunias
 Bupthalmum
Bupleuroides, see *Phyllis*
 Bupleurum
 Bursa Pastoris
 Butomus
 Buxus

C.

C A A P E B A, see *Cisampelos*
 Cacalia
Cacalanthemum, see *Cacalia*
 Cacao
 Cachrys
 Cactus
 Cæsalpina
Cainito, see *Chrysophyllum*
Cakile, see *Bunias*
Calaba, see *Cornus*
Calamintha, see *Melissa*
Calceolus, see *Cypripedium*
 Calendula
 Calla
 Caltha
Camara, see *Lantana*
 Cameraria
 Campanula
Campbora, see *Laurus*
 Canna

Cannabina, see *Datisca*
 Cannabis
Cannacorus, see *Canna*
Capnoides, see *Fumaria*
 Capparis
Capparis Fabago, see *Zygo-phyllum*
 Capraria
Caprifolium, see *Periclymenum*
 Capsicum
Caracalla, see *Phaseolus*
Cardamindum, see *Tropæolum*
 Cardamine
 Cardiaca
 Cardiospermum
 Carduus
Carduus Benedictus, see *Cnicus*
Carduus Fullonum, see *Dipsacus*
 Carica
 Carlina
 Carpinus
 Carthamus
 Carum
Caryophyllata, see *Geum*
 Caryophyllus
Casia, see *Osiris*
 Cassia
Cassida, see *Scutellaria*
 Cassine
 Castanea
Castanea Equina, see *Esculus*
Castorea, see *Durantia*
 Catananche
Cataputia major, see *Ricinus*
Cataputia minor, see *Euphorbia*
Cataria, see *Nepeta*
 Catechæa
 Caucalis
 Ceanothus
 Cedrus
Ceiba, see *Bombax*
 Celastrus
 Celosia
 Celsia
 Celtis
 Centaurea
Centaurium minus, see *Gentiana*
 Cepa
 Cephalanthus
 Cerastium
 Cerasus
Cerasus racemosa, see *Padus*
 Ceratonia
 Cerbera
 Cercis
Cerfolium, see *Chærophylum*
 Cereus
 Cerinthe
 Cestrum
 Chærophylum
Chamæcerasus, see *Lonicera*
Chamæcistus, see *Helianthemum*
Chamæclama, see *Glechoma*
Chamæcyparissus, see *Santolina*
Chamædaphne, see *Ruscus*

Chamædryas, see *Teucrium*
Chamælaea, see *Cneorum*
Chamamelum, see *Anthemis*
Chamæmespilus, see *Mespilus*
Chamæmorus, see *Rubus*
Chamænerium, see *Epilobium*
Chamæpytis, see *Teucrium*
Chamæripbes, see *Chamærops*
 Chamærops
Chamærubus, see *Rubus*
Chamæsyce, see *Euphorbium*
Chamærhododendron, see *Rhododendron*
 Cheiranthus
 Chelidonium
 Chelone
Chenopodio-morus, see *Blitum*
 Chenopodium
 Chionanthus
 Chironia
 Chondrilla
Christophoriana, see *Aëtæa*
Chrysanthemoides, see *Osteospermum*
 Chrysanthemum
 Chrysoalanus
 Chrysocoma
 Chrysophyllum
 Chrysoplenium
 Cicer
 Cichorium
Cicutaria, see *Ligustrum*
Cinara, see *Cynara*
Cineraria, see *Othonna*
 Circea
Cirsium, see *Carduus*
 Cistus
 Citharexylon
 Citrus
 Claytonia
 Clematis
 Cleome
 Clethra
 Cliffortia
 Clinopodium
 Clitoria
 Clusia
 Clutia
Clymenum, see *Lathyrus*
 Clypeola
 Cneorum
 Cnicus
Coa, see *Hippocratea*
Coccygia, see *Rhus*
 Cochlearia
 Coffea
 Coix
 Colchicum
 Coldenia
 Collinsonia
Colocasia, see *Arum*
Colocynthis, see *Cucurbita*
 Columnea
 Colutea
Colutea Scorpioides, see *Emerus*
Coma Aurea, see *Chrysocoma*
 Comarum
 Commelina
 Conium

Conocarpodendron, see *Protea*
 Conocarpus
Consolida major, see *Symphytum*
Consolida media, see *Bugula*
Consolida minima, see *Bellis*
Consolida regalis, see *Delphinium*
 Convallaria
 Convolvulus
 Conyza
 Copaiba
Corallodendron, see *Erythrina*
 Corchorus
 Cordia
 Coreopsis
 Coriandrum
 Coriaria
Corindum, see *Cardiospermum*
 Coris
 Corispermum
 Cornus
 Cornutia
Corona Imperialis, see *Fritillaria*
Corona Solis, see *Helianthus*
 Coronilla
 Cortufa
 Corylus
 Costus
Cotinus, see *Rhus*
Cotonea malus, see *Cydonia*
Cotoneaster, see *Mespilus*
 Cotula
 Cotyledon
Courbaril, see *Hymenæa*
 Crambe
 Craniolaria
 Crassula
 Cratægus
 Crateva
 Crepis
 Crescentia
 Crinum
 Crithmum
Crista Pavonis, see *Poinciana*
 Crocus
 Crotolaria
 Croton
 Crucianella
Crupina Belgarum, see *Centaurea*
 Cucubalus
 Cucumis
Cucumis Agrestis, see *Momordica*
 Cucurbita
Cuiete, see *Crescentia*
Cuminoides, see *Lagœcia*
 Cuminum
Cunila, see *Sideritis*
 Cunonia
 Cupressus
 Curcuma
 Cururu
Cyanus, see *Centaurea*
 Cyclamen
 Cydonia
 Cynanchum

Cynara
Cynoglossum
Cypripedium
Cysticapnos, see Fumaria
Cytiso-genista, see Spartium
Cytifus

D.

DALECHAMPIA
Damafonium
Daphne
Datisca
Datura
Daucus
Daucus Creticus, see Athamanta
D'ayena
Delphinium
Dens Canis, see Erithronium
Dens Leonis, see Leontodon
Dentaria
Dianthera
Dianthus
Diapensia, see Sanicula
Distamnus
Distamnus Creticus, see Origanum
Diervilla
Digitalis
Dioscorea
Diosma
Diospyros
Dipsacus
Dodartia
Doria, see Solidago & Othonna
Doronicum
Dorstenia
Dorycnium, see Lotus
Douglassia
Draba
Draco Herba, see Abrotanum
Draco Arbor, see Palma
Dracocephalum
Dracontium
Dracunculus Pratenfis, see Achillæa
Dulcamara, see Solanum
Durantia

E.

EBULUS, see Sambucus
Ebenus
Echinus
Echinomelocactus, see Cactus
Echinophora
Echinops
Echium
Edera quinquefolia, see Vitis
Elaterium, see Momordica
Elatine, see Linaria
Elæagnus
Elephantopus
Elicbrifum, see Gnaphalium
Emerus
Empetrum
Enula Campana, see Inula
Ephemeron, see Tradescantia

Epigæa
Epilobium
Epimedium
Equisetum
Eranthemum, see Adonis
Erica
Erica Baccifera, see Empetrum
Erigeron
Erinus
Erioccephalus
Eruca
Erucago, see Bunias
Ervum
Eryngium
Erysimum
Erythina
Erythronium
Esfchynomena
Euonymus
Euonymoides, see Celastrus
Eupatoriophalacron, see Verbesina
Eupatorium
Euphorbia
Euphrasia

F.

FABA
Faba Ægyptiaca, see Arum
Faba Crassa, see Sedum
Fabago, see Zygophyllum
Fagonia
Fagopyrum, see Helxine
Fagus
Ferrum Equinum, see Hippocrepis
Ferula
Ficoides, see Mesembryanthemum
Ficus
Ficus Indica, see Opuntia
Filago
Filipendula, see Spiræa
Flammula Jovis, see Clematis
Flos Africanus, see Tagetes
Flos Passionis, see Passiflora
Flos Solis, see Helianthus
Flos Trinitatis, see Viola
Fœniculum
Fœnum Burgundiacum, see Medica
Fœnum Græcum, see Trigonella
Fragaria
Frangula
Fraxinella
Fraxinus
Fritillaria
Fritillaria Crassa, see Stapelia
Fruentum Indicum, see Zea
Frutex Pavonius, see Poinciana
Fuchsia
Fumaria

G.

GALANTHUS
Gale, see Myrica

Galega
Galenia
Galeopsis
Galeopsis frutescens, see Præfium
Gallium
Garcinia
Garidella
Genista
Genista spinosa, see Ulex
Genistella, see Ulex
Gentiana
Gentianella, see Gentiana
Geranium
Gesnera
Geum
Gingidium, see Arteria
Gladiolus
Glaucium, see Chelidonium
Glaux
Glechoma
Gleditsia
Globularia
Gloriosa
Glycine
Glycyrrhiza
Gnaphalium
Gnaphalodes, see Micropus
Gomphrena
Gossypium
Gramen
Granadilla, see Passiflora
Gratiola
Grewia
Gronovia
Grossularia
Guaiabara, see Coccolobus
Guajana, see Diospyros
Guajacum
Guajava, see Psidium
Guanabanus, see Annona
Guaxuma, see Theobroma
Guidonia, see Samyda
Guilandina
Gypfophylla

H.

HÆMANTHUS
Hæmatoxyllum
Halicacabum, see Phytalis
Halicacabus peregrinus, see Cardiospermum
Halimus, see Atriplex
Halleria
Hamamelis
Harmala, see Peganum
Hedera
Hedera Terrestris, see Glecoma
Hedypnois, see Hyoseris
Hedysarum
Helenium
Helianthemum
Helianthus
Heliçteres
Heliocarpus
Heliotropium
Helleborine, see Serapias

Helleborus
Helleborus albus, see Veratrum
Hemerocallis
Hemionitis
Hepatica
Hepatorium, see Eupatorium
Heptaphyllum, see Potentilla
Heracleum, see Sphondylium
Herba Gerardi, see Angelica
Herba Paris, see Paris
Hermannia
Hermodactylus
Hernandia
Herniaria
Hesperis
Hibiscus
Hieracium
Hippocastanum, see Esculus
Hippocratea
Hippocrepis
Hippolapathum, see Lappathum
Hippomane
Hippophae
Hipposelinum, see Smyrni-um
Hirundinaria, see Asclepias
Holchus
Hordeum
Horminum
Hottonia
Hura
Hyacinthus
Hyacinthus Peruvianus, see Ornithogalum
Hyacinthus Tuberosus, see Crinum
Hydrangea
Hydrocotyle
Hydrolapathum, see Lappathum
Hydrophyllon
Hydropiper, see Polygonum
Hyoscyamus
Hypecoon
Hypericum
Hypericum frutex, see Spiræa
Hyslopus

I.

JA C E A, see Centaurea
Jacobæa, see Othonna & Senecio
Jalapa
Jasminoides, see Cestrum & Lycium
Jasminum
Iatropa
Iberis
Ibiscus, see Hibiscus
Icaco, see Chrysobalanus
Ilex

Impatiens
Imperatoria
Inga, see *Acacia*
Intibus, see *Cichorium*
Inula
Johnsonia
Ipomœa
Iris
Iris bulbosa, see *Xiphium*
Iris Persica, see *Xiphium*
Isatis
Isopyrum
Isoa, see *Helioteres*
Itea
Judaica Arbor, see *Cercis*
Juglans
Jujube, see *Ziziphus*
Juhan, see *Hesperis*
Juncus
Juniperus
Jussiaea
Justicia
Ixia

K.

KALI, see *Salfola*
Kalmia
Karatas
Kempferia
Keimia, see *Hibiscus*
Kiggilaria
Knautia

L.

LABLAB, see *Phaseolus*
Labrum Veneris, see *Dipsacus*
Labrusca, see *Vitis*
Laburnum, see *Cytisus*
Lacryma Jobi, see *Coix*
Lactuca
Lactuca Agnini, see *Valeriana*
Lagoccia
Lagopus, see *Trifolium*
Lamium
Lampfana, see *Lapsana*
Lantana
Lapathum, see *Rumex*
Lapsana
Larix
Laserpitium
Lathyrus
Lavatera
Lavendula
Laureola, see *Daphne*
Lauro-cerasus, see *Padus*
Laurus
Laurus Alexandrina, see *Ruscus*
Laurus Tinus, see *Tinus*
Lawsonia
Lens, see *Ervum*
Lentiscus, see *Pistacea*
Leontopetalon, see *Leontice*
Leontice
Leontodon

Leonurus
Lepidium
Lepidocarpodendron, see *Protea*
Leucanthemum, see *Anthemis*
& *Chrysanthemum*
Leucoium
Lichen
Ligusticum
Ligustrum
Lilace, see *Syringa*
Liliastrum, see *Hemerocallis*
Lilio-Aphodelus, see *Hemerocallis*
& *Crinum*
Lilio-Fritillaria, see *Fritillaria*
Lilio Hyacinthus, see *Scilla*
Lilio Narcissus, see *Amaryllis*
Lilium
Lilium Convallium, see *Convallaria*
Lilium Persicum, see *Fritillaria*
Lilium Superbum, see *Gloriosa*
Limodorum
Limon
Limonium
Linaria
Lingua Cervina
Linum
Linum Umbilicatum, see *Cynoglossum*
Lippia
Liquidamber
Lithospermum
Lobelia
Lobus Echinatus, see *Guilandina*
Lonchitis
Lonicera
Loranthus
Lotus
Lotus Arbor, see *Celtis*
Ludvigia
Luffa
Lunaria
Lupinus
Lupulus
Luteola, see *Reseda*
Lychnidea, see *Phlox*
Lychnis
Lycium
Lycopersicon
Lycopus
Lysimachia
Lysimachia Galericulata, see *Scutellaria*
Lysimachia non Papposa, see *Onagra*
Lysimachia Siliquosa, see *Epi-lobium*
Lythrum

M.

MACALEB, see *Cerasus*
Magnolia
Mabaleb, see *Cerasus*
Majorana, see *Origanum*
Mala Æthiopica, see *Lycopersicon*

Mala Armeniaca, see *Armeniaca*
Mala Cotonea, see *Cydonia*
Mala Insana, see *Melongena*
Malacoides, see *Malope*
Malope
Malpighia
Malva
Malva Arborea, see *Lavatera*
Malva Rosea, see *Alcea*
Malus
Malus Armeniaca, see *Armeniaca*
Malus Aurantia, see *Aurantium*
Malus Limonia, see *Limon*
Malus Persica, see *Persica*
Malus Punica, see *Punica*
Mammea
Mancanilla, see *Hippomane*
Mandragora
Manihot, see *Iatropa*
Maranta
Marrubiastrum, see *Sideritis*
Marrubium
Marrubium nigrum, see *Bal-lote*
Martynia
Marum, see *Teucrium*
Marum vulgare, see *Satureja*
Mastichina, see *Satureja*
Matricaria
Maurocena
Mays, see *Zea*
Meadea
Medeola
Medica
Medicago
Melampyrum
Melastroma
Melia
Melianthus
Melilotus, see *Trigonella*
Melissa
Melissa Turcica, see *Dracocephalon*
Melo
Melocactus, see *Cactus*
Melocarduus, see *Cactus*
Melochia, see *Corchorus*
Melongena
Melopepo, see *Cucurbita*
Melothria
Menispermum
Mentha
Mentha Cataria, see *Nepeta*
Mentzelia
Menyanthes
Mesembryanthemum
Mespilus
Methonica, see *Gloriosa*
Meum, see *Athamanta*
Mezerion, see *Thymelæa*
Micropus
Miliun
Millefolium, see *Achillæa*
Milleria
Mimosa
Mimulus

Mirabilis
Mitella
Moldavica, see *Dracocephalon*
Molle, see *Schinus*
Molucca, see *Mollucella*
Mollucella
Moly, see *Allium*
Momordica
Monarda
Monbin, see *Spondias*
Montia, see *Heliocarpus*
Morina
Morus
Moschatellina, see *Adoxa*
Muntingia
Murucua, see *Passiflora*
Musa
Muscari
Muscipula, see *Silene*
Muscus
Myagrum
Mycotis, see *Cerastium*
Myofurus
Myrica
Myrrhis, see *Chærophyllum*,
Scandix, & *Sison*
Myrtus
Myrtus Brabantica, see *Myrica*
Myxa, see *Cordia*

N.

NAPELLUS, see *Aconitum*
Napæa
Napus, see *Brassica* & *Rapa*
Narciso Leucoium, see *Galanthus*
Narcissus
Nasturtium
Nasturtium Indicum, see *Tropæolum*
Nepeta
Nerium
Nicotiana
Nigella
Nigellastrum, see *Agrostemma*
Nissolia, see *Lathyrus*
Noli me tangere, see *Impatiens*
Nummularia, see *Lysimachia*
Nux Juglans, see *Juglans*
Nux Vesicaria, see *Staphylæa*
Nyctanthes
Nymphæa

O.

OBELISCOOTHECA, see *Rudbeckia*
Ochrus, see *Pisum*
Oculus Christi, see *Horminum*
Ocymum
Oenanthe
Oenothera
Oldenlandia
Olea
Omphalodes, see *Cynoglossum*
Onagra

Onagra, see Oenothera
 Onobrychis
 Ononis
 Onopordum
 Ophioglossum
 Ophrys
Opulus, see Viburnum
 Opuntia
 Orchis
Oreoselinum, see Athamanta
 Origanum
 Orinthogalum
Orinthopodium, see Ornithopus
 Ornithopus
 Orobus
 Oryza
 Osmunda
 Osteospermum
 Osyris
 Othonna
 Oxalis
Oxyacantha, see Berberis
Oxys, see Oxalis

P.

PADUS

Pæonia
 Paliurus
 Palma
 Panax
 Pancratium
 Papaver
Papaver Corniculatum, see Chelidonium
Papaver Spinosum, see Argemone
Papaya, see Carica
 Parietaria
 Paris
 Parkinsonia
 Parnassia
 Paronychia
 Parthenium
 Passerina
 Passiflora
 Pastinaca
 Pavia
 Paullinia
 Pedicularis
 Peganum
Pelecinus, see Bifferula
Pentaphylloides, see Potentilla
 Pentapetes
Pepo, see Cucurbita
 Perefskia
 Periclymenum
 Periploca
 Persea
 Perfica
 Perficaria
Pervinca, see Vinca
 Petasites
 Petiveria
 Petrea
Petroselinum, see Apium
 Peucedanum
 Phaca

Phalangium, see Anthericum
Phaseoloides, see Glycine
 Phaseolus
 Philadelphus
 Phillyrea
 Phlomis
 Phlox
 Phyllica
 Phyllanthus
 Phyllis
 Physalis
 Phytolacca
 Piercea
Pilosella, see Hieracium
 Pimpinella
Pimpinella Sanguisorba, see Poterium & Sanguisorba
Pinafter, see Pinus
 Pinguicula
 Pinus
 Piper
 Pisonia
 Pistacia
 Pisum
Pisum Cordatum, see Cardiospermum
Pittonia, see Tournefortia
 Plantago
 Platanus
 Plumbago
 Plumeria
 Podophyllum
 Poinciana
 Polemonium
 Polianthes
 Polium
Polyanthus, see Primula
 Polygala
Polygonatum, see Convallaria
 Polypodium
Pomum Adami, see Aurantium
Populago, see Caltha
 Populus
 Porrum
 Portulaca
 Potentilla
 Poterium
 Prasium
 Prenanthes
 Primula
 Prinos
 Protea
 Prunus
Pseudoacacia, see Robinia
Pseudodiervanos, see Marrubium
 Psidium
 Psoralea
Psylum, see Plantago
Ptarmica, see Achillæa
 Ptelea
 Pulegium
 Pulmonaria
 Pulsatilla
 Punica
Pyracantha, see Mespilus
 Pyrola
 Pyrus

Q.

QUAMOGLIT, see Ipomæa
 Quercus
Quinquefolium, see Potentilla

R.

RANDIA

Ranunculus
 Rapa
 Raphanus
Rapistrum, see Sinapis
 Rapunculus
 Rapuntium
 Rauwolfia
 Reseda
Rhabarbarum, see Rheum
Rhabarbarum Monachorum, see Rumex
Rhamnoides, see Hippophae
 Rhamnus
Rhaponticum, see Rheum
 Rhexia
 Rhinanthus
 Rhodiola
 Rhododendron
 Rhus
 Ribes
Ricinoides, see Iatropha
 Ricinus
 Rivinia
 Robinia
 Rondeletia
 Rosa
Rosa Sinensis, see Hibiscus
 Rosmarinus
 Royena
 Rubia
 Rubus
 Rudbeckia
 Ruellia
 Rumex
 Ruscus
 Ruta
Ruta Canina, see Scrophularia
Ruta Muraria, see Adiantum
Ruta Sylvestris, see Peganum
 Ruyschiana

S.

SABINA

Saccharum
 Sagittaria
Salicaria, see Lythrum
 Salicornia
 Salix
 Salfola
 Salvia
Salvia Agrestis, see Teucrium
 Sambucus
 Samolus
 Samyda
 Sanguinaria

Sanguisorba
Sanguis Draconis, see Palma
 Sanicula
 Santolina
 Sapindus
 Saponaria
 Sapota
 Sarracena
 Satureja
 Satyrium
 Saururus
 Saxifraga
 Scabiosa
 Scandix
 Schinus
 Scilla
 Sclarea
 Scolymus
Scordium, see Teucrium
 Scorpiurus
 Scorzonera
 Scrophularia
 Scutellaria
 Secale
 Securidaca
 Sedum
 Selago
 Selinum
 Sempervivum
 Senecio
 Senna
 Serapias
Serjana, see Paullinia
Serpentaria, see Aristolochia
 Serratula
 Sefamum
 Sefeli
 Sherardia
Sherardia. Vaill. see Verbena
Sicyoides, see Sicyos
 Sicyos
 Sida
 Sideritis
 Sideroxylum
 Sigesbekia
 Silene
 Siler
Siliqua, see Ceratonia
Siliquastrum, see Cercis
 Silphium
 Sinapi
Sinapistrum, see Cleome
 Sifarum
 Sifon
 Sifymbrium
 Sifyrinchium
 Sium
 Smilax
 Smyrnium
Solanoides, see Piercea
 Solanum
 Soldanella
 Solidago
 Sonchus
 Sophora
 Sorbus
Sorbus Sylvestris, see Cratægus
 Spartium
 Spergula

I N D E X L A T I N U S.

Spermacoce
 Sphæranthus
 Sphondylium
 Spigelia
Spina Alba, see Mespilus
Spina Nigra, see Prunus
 Spinacia
 Spiræa
 Stachys
 Stæhelina
 Stapelia
 Staphylæa
 Statice
 Stewartia
 Stæbe
 Stœchas
Stramonium, see Datura
 Stratiotes
 Styraç
Suber, see Quercus
 Suriana
 Symphytum
 Syringa

T.

T A B E R N Æ M O N -
 T A N A

Tacamabacca, see Populus
 Tagetes
 Tamarindus
Tamariscus, see Tamarix
 Tamarix
 Tamus
 Tanacetum
Tapia, see Crateva
 Tarconanthus
 Taxus
Telephoides, see Andrachne

Telephium
Terebinthus, see Pistacia
Ternatea, see Clitoria
 Tetracera
 Tetragonia
*Tetragonocarpos, see Tetrago-
 nia*
 Tetragonotheca
 Teucrium
 Thalictrum
 Thapsia
 Thlaspi
 Theligonum
 Theobroma
Thlaspidium, see Iberis
 Thuja
 Thymbra
Thymelæa, see Daphne
 Thymus
 Tiarella
 Tilia
Tinus, see Viburnum
 Tithymalus
 Toluifera
 Tordilium
 Tormentilla
 Tournefortia
 Toxicodendron
 Trachelium
 Tragacantha
 Tragia
 Tragopogon
Tragoselinum, see Pimpinella
 Tribulus
 Trichomanes
 Trichosanthes
 Trichostema
 Tridax
 Trifolium

Trigonella
 Trillium
 Triosteum
Tripolium, see Aster
 Triticum
 Triumphetta
 Trollius
 Tropæolum
 Tulipa
 Tulipifera
 Turnera
 Turritis
 Tussilago

V.

V A C C A R I A, *see Sapo-
 naria*
 Vaccinium
 Valeriana
*Valeriana Græca, see Polemo-
 nium*
Valerianella, see Valeriana
 Vanilla
 Vella
 Veratrum
 Verbascum
 Verbena
 Verbesina
 Veronica
 Viburnum
 Vicia
 Vinca
Vincetoxicum, see Asclepias
 Viola
Viorna, see Clematis
Virga Aurea, see Solidago
 Viscum
Visnaga, see Daucus

Vitex
 Vitis
Vitis Idæa, see Vaccinium
Vitis Sylvestris, see Clematis
 Ulex
 Ulmaria
 Ulmus
 Urena
 Urtica
 Uva Ursi
 Vulneraria
 Uvularia

W.

W A C H E N D O R F I A
 Walkeria

Waltheria
 Warneria
 Watsonia

X.

X E R A N T H E M U M

Xiphion
 Xylon

Y.

Y U C C A

Z.

Z A N T H O X Y L U M

Zinziber, *see Amo-
 mum*
 Ziziphora
 Ziziphus

T H E

E N G L I S H N A M E S

O F

P L A N T S mentioned in this W O R K,

Referring to their L A T I N N A M E S.

A.

ABELE-Tree, *see Populus*
 Acacia, or Egyptian Thorn, *see Acacia*
 Acacia, the False, *see Robinia*
 Acacia, the German, *see Prunus*
 Acacia, the three-thorned, or Honey-Locust, *see Gleditsia*
 Aconite, or Wolf's-bane, *see Aconitum*
 Aconite, the Winter, *see Helleborus*
 Adam's Apple, *see Aurantium*
 Adder's Tongue, *see Ophioglossum*
 Adder's Wort, or Snake-weed, *see Bistorta*
 Adonis Flower, *see Adonis*
 African Marigold, *see Tagetes*
 Agrimony, *see Agrimonia*
 Agrimony, the Water, *see Bidens*
 Ague-tree, or Sassafras, *see Laurus*
 Alecoast, or Coastmary, *see Tanacetum*
 Alehoof, or Ground Ivy, *see Glecoma*
 Alder-tree, *see Alnus*
 Alder, the Berry-bearing, *see Frangula*
 Alheal, *see Panax*
 Alheal, the Clown's, *see Sideritis*
 Alifander, or Alexander, *see Smyrniium*
 Alkanet, *see Anchusa*
 Allelujah, or Wood Sorrel, *see Oxalis*
 Alligator Pear, *see Persea*
 Allspice, *see Cariophyllus*
 Almond-tree, *see Amygdalus*
 Almond, the Dwarf, *see Persica*
 Almond, the Ethiopian, *see Brabeium*
 Aloe, *see Agave*
 Amaranth, *see Amaranthus and Celosia*
 Amaranth, the Globe, *see Gomphrena*
 Amber-tree, *see Anthospermum*
 Anemomy, *see Anemone*
 Anis, *see Apium*
 Apple, *see Malus*
 Apple, the Custard, *see Annona*
 Apple of Love, *see Lycopersicon and Solanum*

Apple, the Mad, *see Melongena*
 Apple, Male Balsam, *see Momordica*
 Apple, the Paradise, *see Malus*
 Apple, the Sour, or Sourfop, *see Annona*
 Apple, the Sweet, or Sugar, *Id.*
 Apple, the Thorn, *see Datura*
 Apricot, *see Armeniaca*
 Archangel, *see Lamium*
 Aron, or Wake-robin, *see Arum*
 Arrow-root, *see Maranta*
 Arsmart, *see Persicaria*
 Artichoke
 Artichoke of Jerusalem, *see Helianthus*
 Asarabacca, *see Asarum*
 Ash, *see Fraxinus*
 Ash, the Mountain, *see Sorbus-*
 Asparagras, or Sparrowgras, *see Asparagus*
 Aspen-tree, *see Populus*
 Asphodel, *see Asphodelus*
 Asphodel, the African, *see Anthericum*
 Aphodel Lily, *see Hemerocallis and Crinum*
 Avens, *see Geum*
 Avenue
 Avocado Pear, *see Persea*
 Ax-vetch, *see Securidaca*
 Azarole, *see Mespilus*

B.

BALM of Gilead, *see Dracocephalon*
 Balm of Gilead Fir, *see Abies*
 Balsam of Capevi, *see Copaiba*
 Balsam-tree, *see Pistacia*
 Balsamine, *see Impatiens*
 Balsam Apple, *see Momordica*
 Bamboo Cane, *see Arundo*
 Bonana, *see Musa*
 Baneberries, *see Actæa*
 Barbadoes Cherry, *see Malpighia*
 Barbadoes Flower-fence, *see Poinciana*

Barberry, *see Berberis*
 Barley, *see Hordeum*
 Barley, the Naked, *see Triticum*
 Barrenwort, *see Epimedium*
 Basil, *see Ocimum*
 Basil, the Stone, *see Acinos*
 Bastard Acacia, *see Robinia*
 Bastard Dittany, *see Marrubium*
 Bachelor's Button, *see Lychnis and Centaurea*
 Bachelor's Pear, *see Solanum*
 Baulm, *see Melissa*
 Baulm, the Molucca, *see Moluccella*
 Baulm, the Turkey, *see Dracocephalon*
 Bay, *see Laurus*
 Bay of Alexandria, *see Ruscus*
 Bay, the Cherry, *see Padus*
 Bay, the Indian, *see Laurus*
 Bay, the Rose, *see Nerium*
 Bay, the Sweet-flowering, *see Magnolia*
 Bead-tree, *see Melia*
 Beam, the Hard, or Hornbeam, *see Carpinus*
 Beam-tree, the White, *see Crategus*
 Bean, *see Faba*
 Bean, the Bog, or Bogbean, *see Menyanthes*
 Bean, the Kidney, or French, *see Phaseolus*
 Bean, Caper, *see Zygophyllum*
 Bean, Trefoil, *see Cytisus*
 Bean-tree, *see Erythrina*
 Bean, the Kidney Bean-tree, *see Glycine*
 Beard, the old Man's, *see Clematis*
 Bear's Breech, *see Acanthus*
 Bear's Ear, *see Auricula*
 Bear's Ear Sanicle, *see Cortusa and Verbascum*
 Bear's Foot, *see Helleborus*
 Bedinjan, or Pottle John, *see Melongena*
 Bedstraw, our Lady's, *see Gallium*
 Bee Flower, *see Orchis*
 Beech-tree, *see Fagus*

Beet, *see Beta*
 Bell Flower, *see Campanula*
 Bells, the Canterbury, *Id.*
 Bell's Hair, *see Hyacinthus*
 Bell Flower, the Peach-leaved, *see Campanula*
 Bell Flower, the Steeple, *Id.*
 Bell Pepper, *see Capsicum*
 Belly-ache Weed, *see Iatropa*
 Belmusk, or Abelmusk, *see Hibiscus*
 Benjamin-tree, *see Laurus*
 Bennet Herb, *see Gum*
 Berberry, *see Berberis*
 Betony, *see Betonica*
 Betony, Paul's, *see Veronica*
 Betony, the Water, *see Scrophularia*
 Bethlehem Star, *see Ornithogalum*
 Bifoil, or Twayblade, *see Ophrys*
 Bilberry, *see Vaccinium*
 Bindweed, *see Convolvulus*
 Bindweed, the black, *see Tamus*
 Bindweed, the prickly, *see Smilax*
 Birch-tree, *see Betula*
 Birch-tree of America, *see Pistacia*
 Bird Cherry, *see Padus*
 Bird's Eye, *see Adonis and Primula*
 Bird's Foot, *see Ornithopus*
 Bird's Foot Trefoil, *see Lotus*
 Bird's Nest, *see Daucus*
 Bird Pepper, *see Capsicum*
 Birthwort, *Aristolochia*
 Bishop's Weed, *see Ammi*
 Bitter-sweet, *see Solanum*
 Bitter Vetch, *see Orobus*
 Bitterwort, *see Gentiana*
 Blackberry, *see Rubus*
 Black Briony, *see Tamus*
 Blackthorn, *see Prunus*
 Bladder Nut, *see Staphylea*
 Bladder Nut, the African, *see Royenia*
 Bladder Sena, *see Colutea*
 Blights
 Blite, *see Blitum*
 Blood Flower, *see Hæmanthus*
 Bloodwort, *see Rumex*
 Bluebottle, *see Hyacinthus and Centaurea*
 Bolbonach, or white Satten, *see Lunaria*
 Bonana, *see Musa*
 Borecole, *see Brassica*
 Borrage, *see Borrage*
 Box, *see Buxus*
 Box-thorn, *see Lycium*
 Brake, *see Filix*
 Bramble, *see Rubus*
 Brank-urine, *see Acanthus*
 Bread, St. John's, *see Ceratonia*
 Briar, the Sweet, *see Rosa*
 Briar, the Wild, *Id.*
 Briony, *see Brionia*
 Bristol Flower, *see Lychnis*
 Brimstonewort, *see Peucedanum*
 Broccoli, *see Brassica*
 Brooklime, *see Veronica*
 Broom, *see Genista*
 Broom, the Butcher's, *see Ruscus*
 Broom, the Green, *see Spartium*
 Broom, the Spanish, *see Genista*
 Broom, the White, *see Spartium*

Broom, Rape, *see Orobanche*
 Brownwort, *see Scrophularia and Prunella*
 Bruisewort, *see Lychnis*
 Buckhorn, or Hartshorn Plantain, *see Plantago*
 Buckthorn, *see Rhamnus*
 Buckthorn, the Sea, *see Hippophae*
 Buck Wheat, *see Helxine*
 Budding, *see Inoculating*
 Bugle, *see Bugula*
 Bugloss, *see Anchusa*
 Bugloss, the Viper's, *see Echium*
 Builace-tree, *see Prunus*
 Bully-tree, *see Chrysohyllum*
 Burdock, *see Arctium*
 Burdock, the lesser, *see Xanthium*
 Burnet, *see Sanguisorba*
 Burnet Saxifrage, *see Pimpinella*
 Butcher's Broom, *see Ruscus*
 Butter-bur, *see Petasites*
 Butterfly Flower, *see Orchis*
 Butterwort, *see Pinguicula*
 Button-tree, *see Platanus and Cephalanthus*
 Button-tree of Jamaica, *see Conocarpus*

C.

CABBAGE, *see Brassica*
 Cabbage, the Sea, *see Crambe*
 Cabbage-tree, *see Palma*
 Cajou, *see Anacardium*
 Calabash, *see Cucurbita*
 Calabash-tree, *see Crescentia*
 Calamint, *see Melissa*
 Calamint, the Water, *see Mentha*
 Caltrops, *see Tribulus*
 Calves Snout, *see Antirrhinum*
 Cammock, *see Ononis*
 Camomile, *see Anthemis*
 Camphire-tree, *see Laurus*
 Champion, *see Lychnis*
 Candle-berry-tree, *see Myrica*
 Candy Carrot, *see Athamanta*
 Candy-tuft, *see Iberis*
 Candy-tuft Tree, *Id.*
 Cane, the Bamboo, *see Arundo*
 Cane, the Indian flowering, *see Canna*
 Cane, the dumb, *see Arum*
 Cane, the Fishing-rod, *see Arundo*
 Cane, the Sugar, *see Saccharum*
 Canterbury-bell, *see Campanula*
 Caper, *see Capparis*
 Caper, the Bean, *see Zygophyllum*
 Caraway, *see Carum*
 Cardinal's Flower, *see Rapuntium*
 Carlisle Thistle, *see Carlina* *Cardoon*
 Carlock, *see Sinapis and Raphanus* *Cynara*
 Carnation, *see Dianthus*
 Carnation, the Spanish, *see Poinciana*
 Carob, *see Ceratonia*
 Carrot, *see Daucus*
 Carrot, the Deadly, *see Thapsia*
 Carrot, the Candy, *see Athamanta*
 Carrot, the Scorching, *see Thapsia*
 Cassada, or Cassavi, *see Iatropa*
 Cassidony, *see Stæchas*
 Cassidony, the Mountain, *see Gnaphalium*

Cassidony, the Golden, *Id.*
 Cassioberry-tree, *see Cassine*
 Catchfly, *see Silene*
 Caterpillar Plant, *see Scorpiurus*
 Cat Mint, *see Nepeta*
 Cauliflower, *see Brassica*
 Cedar of Bermudus, *see Juniperus*
 Cedar of Carolina, *Id.*
 Cedar, the Bastard, *see Theobroma*
 Cedar of Libanus, *see Larix*
 Cedar of Lycia, *see Juniperus*
 Cedar, the White, *see Cupressus*
 Celandine, *see Chelidonium*
 Celeri, *see Apium*
 Centaury, *see Gentiana*
 Ceterach, *see Asplenium*
 Chamomile, *see Anthemis* *Cardoon see*
 Charlock, *see Sinapis* *Cynara*
 Charvill, *see Chærophyllum*
 Chaste-tree, *see Vitex*
 Cheese-runnet, *see Gallium*
 Cherry-tree, *see Cerasus*
 Cherry Bay, *see Padus*
 Cherry of Barbadoes, *see Malpighia*
 Cherry, the Bird, *see Padus*
 Cherry Laurel, *Id.*
 Cherry, the Cornelian, *see Cornus*
 Cherry, the Portugal, *see Padus*
 Cherry, the Cowhedge, *see Malpighia*
 Cherry, the Winter, *see Physalis and Solanum*
 Cherry, the perfumed, *see Cerasus*
 Chervill, *see Chærophyllum*
 Chestnut-tree, *see Castanea*
 Chestnut, the Horse, *see Fesculus*
 Chestnut, the scarlet Horse, *see Pavia*
 Chiches, *see Cicer*
 Chickling Pea, *see Lathyrus*
 Chickweed, *see Alfine*
 Chickweed, the Berry-bearing, *see Cucubalus*
 Chives, *see Cæpa*
 Chocolate Nut, *see Cocoa*
 Christmas Rose, *see Helleborus*
 Christ's Thorn, *see Paliurus*
 Christopher Herb, *see Actea*
 Cibouls, *see Cæpa*
 Cicely, *see Chærophyllum*
 Cinquefoil, *see Potentilla*
 Cinquefoil Shrub, *Id.*
 Cinnamon, *see Laurus*
 Cistus, or Rock Rose, *see Cistus*
 Cistus, the Dwarf, *see Helianthemum*
 Citron-tree, *see Citrum*
 Citrul, *see Anguria*
 Cives, *see Cæpa*
 Clary, the Garden, *see Sclarea*
 Clary, the wild, *see Horniminum*
 Climber, *see Clematis and Vitis*
 Clivers, *see Aparine*
 Cloud Berry, *see Rubus*
 Clover, *see Trifolium*
 Clover, the Snail, *see Medicago*
 Clove Gillflower, *see Dianthus*
 Clowns Woundwort, *see Sideritis*
 Coastmary, *see Tanacetum*
 Cob Nut, *see Corylus*
 Coccygria, *see Rhus*
 Cockscorn, *see Rhinanthus*

I N D E X.

Cockscorn Amaranth, *see Celosia*
 Cocksheld, *see Onobrychis*
 Cocoa Nut, *see Coccus*
 Codlin-tree, *see Malus*
 Codlins and Cream, *see Epilobium*
 Coffee
 Cole Seed, *see Brassica*
 Colewort, *Id.*
 Colewort, the Sea, *see Convolvulus*
 Colliflower, *see Brassica*
 Coloquintida, *see Cucumis*
 Coltsfoot, *see Tussilago*
 Co'tsfoot, the Alpine, *see Cacalia*
 Columbine, *see Aquilegia*
 Columbine, the feathered, *see Thalictrum*
 Comfry, *see Symphytum*
 Comfry, the spotted, *see Pulmonaria*
 Composts
 Confound, the great, *see Symphytum*
 Confound, the middle, *see Bugula*
 Confound, the least, *see Bellis*
 Confound, Saracens, *see Solidago*
 Conservatory, *see Green-house*
 Conval Lily, *see Convallaria*
 Coral-tree, *see Erythrina*
 Coriander, *see Coriandrum*
 Cork-tree, *see Suber*
 Corn Bottle, *see Centaurea*
 Corn Flag, *see Gladiolus*
 Corn Marigold, *see Chrysanthemum*
 Corn Violet, *see Campanula*
 Corn Sallad, *see Valeriana*
 Cornelian Cherry, *Id.*
 Cornel-tree, *see Cornus*
 Costmary, *see Tanacetum*
 Cotton, *see Gossypium*
 Cotton, the Silk, *see Bombax*
 Cotton Weed, *see Filago*
 Couch, or Dog Grass, *see Gramen*
 Coventry Bells, *see Campanula*
 Cowl, the Friars, *see Arum*
 Cowslip, *see Primula*
 Cowslip of Jerusalem, *see Pulmonaria*
 Cows Lungwort, *see Verbascum*
 Crab tree, *see Malus*
 Cranesbill, *see Geranium*
 Cress, *see Nasturtium*
 Cress, the Indian, *see Tropeolum*
 Cress, the Sciatica, *see Iberis*
 Cress, the Swines, *see Cochlearia*
 Cress, the Water, *see Sisymbrium*
 Cress, the Winter, *Id.*
 Crimson Grass Vetch, *see Lathyrus*
 Cross-wort, *see Cruciatu*
 Cross of Jerusalem, *see Lychnis*
 Crowfoot, *see Ranunculus*
 Crow Garlick, *see Cepa*
 Crow Flowers, *see Lychnis*
 Crown Imperial, *see Fritillaria*
 Cuckow Flower, *see Cardamine*
 Cucumber, *see Cucumis*
 Cucumber, the wild, *see Momordica*
 Cudweed, *see Gnaphalium and Filago*
 Cullion, *see Orchis*
 Cumin, *see Cuminum*
 Currant-tree, *see Ribes*
 Custard Apple, *see Annona*
 Cypress-tree, *see Cupressus*

Cypress, the Garden, or Lavender Cotton, *see Santolina*
 Cypress, the Summer, *see Chenopodium*

D.

Daffodil, *see Narcissus*
 Daffodil Lily, *see Amaryllis*
 Daffodil, the Sea, *see Pancratium*
 Daisy, *see Bellis*
 Daisy, the Ox Eye, *see Chrysanthemum*
 Dames Violet, *see Hesperis*
 Dandelion, *see Leontodon*
 Danewort, or Dwarf Elder, *see Sambucus*
 Date-tree, *see Palma*
 Date Plum, *see Diospyrus*
 Day Lily, *see Hemerocallis*
 Dead Nettle, *see Lamium*
 Deadly Carrot, *see Thapsia*
 Deadly Nightshade, *see Atropa*
 Devil in a Bush, *see Nigella*
 Devil's Bit, *see Scabiosa*
 Diers Broom, *see Genista*
 Diers Weed, *see Reseda*
 Dill, *see Anethum*
 Distaff Thistle, *see Atractylis*
 Dittander, or Pepperwort, *see Lepidium*
 Dittany, *see Origanum*
 Dittany, the Bastard, *see Marrubium*
 Dittany, the white, *see Dictamnus*
 Dock, *see Rumex*
 Doctor Tinkers Weed, *see Triosteum*
 Dogbane, *see Apocynum, Asclepias, and Cynanchum*
 Dogberry-tree, *see Cornus*
 Dog Grass, *see Gramen*
 Dog's Mercury, *see Mercurialis*
 Dog's Tooth, *see Erythronium*
 Dog's Stones, *see Orchis*
 Dog's Tongue, *see Cynoglossum*
 Dogwood, *see Cornus*
 Dogwood of Jamaica, *see Robinia*
 Dogwood of Virginia, *see Laurus*
 Double Leaf, or Twyblade, *see Ophris*
 Double Tongue, *see Ruscus*
 Dove's Foot, *see Geranium*
 Dragons, *see Dracontium*
 Dragon-tree, *see Palma*
 Dragon, the wild, or Tarragon, *see Abrotanum*
 Dropwort, *see Spiraea*
 Dropwort, the Water, *see Oenanthe*
 Duck's Foot, *see Podophyllum*
 Duck's Meat, *see Lenticula*
 Dung
 Dwale, or deadly Nightshade, *see Atropa*
 Dwarf Bay, *see Daphne*
 Dwarf Cistus, *see Helianthemum*
 Dwarf Almond, *see Persica*
 Dwarf Oak, *see Quercus*
 Dwarf Trees

E.

EARTH
 Earth Nut, *see Bunium*
 Earth Peas, *see Lathyrus*
 Earth Peas, the African, *see Arachis*

Egg Plant see Melongena

Edging
 Eglantine, *see Rosa*
 Elder-tree, *see Sambucus*
 Elder, the Marsh, *see Viburnum*
 Elder, the Spanish, *see Saururus*
 Elecampane, *see Inula*
 Elm tree, *see Ulmus*
 Enchanters Nightshade, *see Circaea*
 Endive, *see Cichorium*
 Eringo, *see Eryngium*
 Espalier
 Eternal Flower, *see Gnaphalium and Xeranthemum*
 Ever-green Honeyfuckle, *see Perichlymenum*
 Ever green Oak, *see Quercus*
 Ever-green Privet, *see Ligustrum*
 Ever-green Rose, *see Rosa*
 Ever green Thorn, *see Mespilus*
 Everlasting Pea, *see Lathyrus*
 Eye-bright, *see Euphrasia*

F.

FEATHERFEW, *see Matricaria*
 Feather, the Princes, *see Amaranthus*
 Felonywort, *see Solanum*
 Fellwort, *see Gentiana*
 Fences
 Fennel, *see Foeniculum*
 Fennel, the Hogs, *see Peucedanum*
 Fennel-giant, *see Ferula*
 Fennel, the scorching, *see Thapsia*
 Fennel Flower, *see Nigella*
 Fenugreek, *see Trigonella*
 Fern, *see Filix*
 Fern, the sweet, *see Scandix*
 Feverfew, *see Matricaria*
 Feverfew, the Bastard, *see Parthenium*
 Fiddle Dock, *see Rumex*
 Fiddle Wood, *Citharexylon*
 Field Basil, *see Acinos*
 Fig tree, *see Ficus*
 Fig, the Arched Indian, *Id.*
 Fig, the Indian, *see Opuntia*
 Fig, the infernal, *see Argemone*
 Fig, Pharaoh's, *see Musa*
 Fig, Marigold, *see Mesembryanthemum*
 Figwort, *see Scrophularia*
 Filbert, *see Corylus*
 Fingrigo, *see Pisonia*
 Finochia, *see Foeniculum*
 Fir-trees, *see Abies*
 Fir, the Scotch, *see Pinus*
 Flag, the Corn, *see Gladiolus*
 Flag, the Common, *see Iris*
 Flag, the sweet-scented, *see Acorus*
 Flag, the yellow Marsh, *see Iris*
 Flax, *see Linum*
 Flax, the Toad, *see Linaria*
 Fleabane, *see Coryza*
 Fleabane, the African, *see Tarconanthus*
 Fleawort, *see Thyllium*
 Flixweed, *see Sisymbrium*
 Flower
 Flower-de-luce, *see Iris and Xiphion*
 Flower gentle, *see Amaranthus*
 Flower eternal, *see Xeranthemum*

Ficoides Diamond

Flower everlasting, *see Gnaphalium*
 Flower-fence, *see Poinciana*
 Flower, the four o'Clock, *see Mirabilis*
 Flower, Sun, *see Helianthus*
 Fluelline, *see Veronica*
 Flywort, or Catchfly, *see Lychnis and Silene*
 Fools Stones, *see Orchis*
 Foxglove, *see Digitalis*
 Framboise, *see Rubus*
 French Cowslip, *see Auricula*
 French Honeysuckle, *see Hedyсарum*
 French Lavender, *see Stachas*
 French Marigold, *see Tagetes*
 French Mercury, *see Mercurialis*
 French Wheat, *see Helxine*
 French Willow, *Epilobium*
 Friars Cowl, *see Arum*
 Fringe-tree, *see Chionanthus*
 Fritillary, *see Fritillaria*
 Fritillary Crassa, *see Stapelia*
 Frost
 Fruit
 Fumatory, *see Fumaria*
 Fumatory, the bulbous-rooted, *Id.*
 Fumatory, the Bladder, *Id.*
 Fumatory, the podded, *Id.*
 Furz, *see Ulex*
 Fustick-tree, *see Morus*

G.

GALE, or sweet Willow, *see Myrica*
 Galingale, *see Cyperus*
 Gall Oak, *see Quercus*
 Gardens
 Garlick, *see Allium*
 Garlick, the Crow, or wild, *see Cepa*
 Gatton-tree, *see Cornus*
 Gaule, or Dutch Willow, *see Myrica*
 Gelder Rose, *see Viburnum*
 Generation
 Gentian, *see Gentiana*
 Gentianella, *Id.*
 Germander, *see Teucrium*
 Germander-tree, *Id.*
 Germander, the Water, *Id.*
 Gilliflower, *see Dianthus*
 Gilliflower, the Queen's, *see Hesperis*
 Gilliflower, the Stock, *see Cheiranthus*
 Gill-go-by-Ground, *see Glechoma*
 Ginger, *see Anomum*
 Gladwin, *see Iris*
 Glafs-wort, *see Salicornia and Salsola*
 Glattenbury Thorn, *see Mespilus*
 Globe Daisy, *see Globularia*
 Globe Crowfoot, *see Trollius*
 Globe Amaranthus, *see Gomprena*
 Globe Flower, or Bottle, *see Centaurea*
 Globe Thistle, *see Echinops*
 Goats-beard, *see Tragopogon*
 Goats-rue, *see Galega*
 Goats-stones, *see Orchis*
 Goats-thorn, *see Tragacantha*
 Gold of Pleasure, *see Myagrum*
 Goldy-locks, *see Chrysocoma*
 Golden flower-gentle, *see Amaranthus*
 Golden Cups, *see Ranunculus and Trollius*

Golden Rod, *see Solidago*
 Goosberry, *see Grossularia*
 Goosberry of Barbadoes, *see Pereskia*
 Goosberry, the American, *see Melastoma*
 Goose-grass, *see Aparine*
 Goose-foot, *see Chenopodium*
 Gorse, or Furz, *see Ulex*
 Go-to-bed-at-Noon, *see Tragopogon*
 Gourd, *see Cucurbita*
 Gourd, the bitter, *Id.*
 Gourd, the Indian Tree, *see Crescentia*
 Gourd, the four, *see Adansonia*
 Gout-wort, *see Agopodium*
 Grafting
 Grain, the oily, *see Sesamum*
 Grain, the scarlet, *see Opuntia and Quercus*
 Grape, *see Vitis*
 Grape, the Sea Side, *see Coccolobus*
 Grape Hyacinth, *see Muscari*
 Grass, *see Gramen*
 Grass of Parnassus, *see Parnassia*
 Grass, the three-leaved, *see Trifolium*
 Grass-vech, *see Lathyrus*
 Grass, the Vipers, *see Scorzonera*
 Gravel
 Graymill, or Gromwell, *see Lithospermum*
 Greek Valerian, *see Polemonium*
 Green-house
 Green, the Winter, *see Pyrola*
 Gromwell, *see Lithospermum*
 Ground-ivy, *see Glechoma*
 Ground Pine, *see Teucrium*
 Groundsel, *see Senecio and Erigeron*
 Groundsel, the African, *see Cacalia*
 Grove
 Guava, *see Psidium*
 Guinea Corn, *see Milium*
 Guinea Henweed, *see Petiveria*
 Guinea Pepper, *see Capsicum*
 Guinea Wheat, *see Zea*
 Gum Succory, *see Chondrilla*

H.

HAIR Bell, *see Hyacinthus*
 Hardbeam, *see Carpinus*
 Hares Ear, *see Bupleurum*
 Hares-foot Trefoil, *see Trifolium*
 Hares Lettuce, *see Sonchus*
 Hares-strong, *see Peucedanum*
 Harmel, *see Peganum*
 Hartwort, *see Tordylium*
 Hartwort of Ethiopia, *see Bupleurum*
 Harts Horn, *see Plantago*
 Harts Tongue, *see Lingua Cervina*
 Hatchet-vech, *see Securigida*
 Hawk-weed, *see Hieracium*
 Hawthorn, *see Mespilus*
 Hazel, *see Corylus*
 Hazel, the Witch, *see Ulmus*
 Hearts Ease, *see Viola*
 Heath, *see Erica*
 Heath, the Berry-bearing, *see Empe-trum*
 Heath, the low Pine, *see Coris*
 Hedges
 Hedge Hog, *see Medicago*
 Hedge-hog Thistle, *see Cactus*
 Hedge Hyslop, *see Gratiola*
 Hedge Mustard, *see Erysinum*
 Hedge Nettle, *see Galeopsis*
 Hedge-nettle Shrub, *see Prasium*
 Heliotrope, *see Heliotropium*
 Heliotrope, or Sun-flower, *see Helianthus*
 Hellebore, the Black, *see Helleborus*
 Hellebore, the Bastard, *see Serapias*
 Hellebore, the White, *see Veratrum*
 Helmet Flower, *see Scutellaria*
 Hemlock, *see Cicuta*
 Hemlock, the Bastard, *see Ligusticum*
 Hemlock, the Water, *see Phellandrium*
 Hemp, *see Cannabis*
 Hemp Agrimony, *see Eupatorium*
 Hemp, the Bastard, *see Datisca*
 Hemp, the Water, *see Bidens*
 Henbane, *see Hyoscyamus*
 Henbane, the yellow, *see Nicotiana*
 Herb Bennet, *see Geum*
 Herb Christopher, *see Aëlea*
 Herb Gerard, *see Angelica*
 Herb of Grace, *see Ruta*
 Herb Paris, *see Paris*
 Herb Robert, *see Geranium*
 Herb Trefoil, *see Trifolium*
 Herb Trinity, *see Viola*
 Herb True-love, *see Paris*
 Herb Two-pence, *see Lythmachia*
 Herb Willow, *see Epilobium*
 Hercules's All-heal, *see Heracleum and Pastinaca*
 Hermodactyl, *see Hermodactylus*
 Hightaper, *see Verbascum*
 Hogs Fennel, *see Peucedanum*
 Hog Plum, *see Spondias*
 Hog Weed, *see Boerhaavia*
 Hollow Root, *see Fumaria*
 Hollyhock, *see Alcea*
 Holly-tree, *see Ilex*
 Holly, the Knee, *see Ruscus*
 Holly, the Sea, *see Eryngium*
 Holm Oak, *see Quercus*
 Holy Rose, *see Cistus*
 Holy Thistle, *see Cnicus*
 Honeysuckle, *see Periclymenum*
 Honeysuckle, the French, *see Hedyсарum*
 Honeysuckle, the Trumpet, *see Periclymenum*
 Honeysuckle, the upright, *see Lonicera*
 Honesty, *see Lunaria*
 Honey Flower, *see Melianthus*
 Honey-wort, *see Cerinthe*
 Hone-wort, *see Sium*
 Hops, *see Lupulus*
 Hop Hornbeam, *see Carpinus*
 Hop, the Wild, *see Ptelea*
 Horehound, *see Marrubium*
 Horehound, the Black, *see Ballote*
 Horehound, the Base, *see Stachys*
 Horehound, the Bastard, *see Sideritus*
 Horehound, the Water, *see Lycopus*
 Hornbeam, *see Carpinus*
 Horizontal Shelters
 Horned Poppy, *see Chelidonium*
 Horse Chestnut, *see Esculus*
 Horse Chestnut, the Scarlet, *see Pawia*
 Horse

Horfe Mint, *see Mentha*
 Horfe Radish, *see Cochlearia*
 Horseshoe-vetch, *see Hippocrepis*
 Horfe Tail, *see Equisetum*
 Horns and Hedgehog, *see Medicago*
 Hofe-in-hofe, *see Primula*
 Hounds-tongue, *see Cynoglossum*
 Hot-bed
 Houfleeck, *see Sedum and Sempervivum*
 Humble Plant, *see Mimosa*
 Hyacinth, *see Hyacinthus*
 Hyacinth, the Grape, *see Muscari*
 Hyacinth of Peru, *see Scilla*
 Hyacinth, the flarry, *Id.*
 Hyacinth, the Tuberoſe, *see Polianthes*
and Crinum
 Hyffop, *see Hyffopus*
 Hyffop, the Hedge, *see Gratiola*

J.

Jacinth, *see Hyacinthus*
 Jack by the Hedge, *see Eryſimum*
 Jack in a Box, *see Hernandia*
 Jacob's Ladder, *see Polemonium*
 Jalap, *see Convolvulus*
 Jalap, the Falſe, *see Mirabilis*
 Jaſmine, *see Jaſminum*
 Jaſmine, the Ilex-leaved, *see Lantana*
 Jaſmine, the American ſcarlet, *see Big-*
nonia
 Jaſmine, the Red of Jamaica, *see Plu-*
meria
 Jaſmine, the Perſian, *see Syringa*
 Jaſmine, the Fennel leaved, *see Ipomoea*
 Ice Houſe. *Plant. Meſembryanthe*
 Jeruſalem Artichoke, *see Helianthus*
 Jeruſalem Cowſlip, *see Pulmonaria*
 Jeruſalem Sage, *see Phlomis*
 Jeſuits Bark, the Falſe, *see Baccharis*
 Jews Mallow, *see Corchorus*
 Immortal Eagle Flower, *see Impa-*
tians
 Immortal Flower, *see Gnaphalium*
 Inarching
 Indian Arrow Root, *see Maranta*
 Indian Creſs, *see Tropæolum*
 Indian Corn, *see Zea*
 Indian Fig, *see Opuntia*
 Indian God-tree, *see Ficus*
 Indian Reed, *see Cauna*
 Indigo, *see Anil*
 Inoculating
 Job's Tears, *see Coix*
 St. John's Bread, *see Ceratonia*
 St. John's Wort, *see Hypericum*
 John's-ſweet, *see Dianthus*
 Jonquil, *see Narciffus*
 Iron-wood, *see Sideroxylum*
 Iron-wort, *see Sideritis*
 Jucca, *see Yucca*
 Judas-tree, *see Cercis*
 Jujube, *see Ziziphus*
 Julians, *see Heſperis*
 Juniper, *see Juniperus*
 Jupiter's Beard, *see Anthyllis*
 Ivy-tree, *see Hedera*
 Ivy, the Ground, *Glechoma*

K.

Kidney-bean, *see Phaficlus*
 Kidney-bean Tree, *see Glycine*
 Kidney-wort, *see Geum and Cotyledon*
 King's Spear, *see Aſphodelus*
 Kitchen-garden
 Knap-weed, *see Centaurea*
 Knee-holm, *see Ruſcus*
 Knee-holly, *Id.*
 Knights-cross, *see Lychnis*
 Knot-berries, *see Rubus*
 Knot-graſs, *see Polygonum*
 Knot-graſs, the Mountain, *see Illece-*
brum

L.

Laburnum, *see Cytifus*
 Labyrinth
 Ladies Bedſtraw, *see Gallium*
 Ladies Bower, *see Clematis*
 Ladies Comb, *see Scandix*
 Ladies Mantle, *see Alchemilla*
 Ladies Seal, *see Tamus*
 Ladies Slipper, *see Cypripedium*
 Ladies Smock, *see Cardamine*
 Ladies Traces, *see Orchis*
 Ladder to Heaven, *see Convallaria*
 Lambs Lettuce, *see Valeriana*
 Land
 Larch-tree, *see Larix*
 Larkſpur, *see Delphinium*
 Laſerwort, *see Laſerpitium*
 Lavender, *see Lavendula*
 Lavender Cotton, *see Santolina*
 Lavender, the French, *see Stæchas*
 Lavender, the Sea, *see Limonium*
 Laurel, *see Padus*
 Laurel, the Portugal, *Id.*
 Laurel of Alexandria, *see Ruſcus*
 Laurel, the Dwarf, or Spurge, *see*
Daphne
 Laurel, the Sea Side, *see Phyllanthus*
 Lauruſtinus, *see Viburnum*
 Lawn
 Layers
 Leadwort, *see Plumbago*
 Leeks, *see Porrum*
 Lemon-tree, *see Limon*
 Lemon, the Water, *see Paſſiflora*
 Lentil, *see Ervum*
 Leopards bane, *see Doronicum*
 Lettuce, *Laëtuca*
 Lettuce, the Lamb's, *see Valeriana*
 Lettuce, the Wild, *see Prenanthes*
 Level
 Life Everlaſting, *see Gnaphalium*
 Lily, *see Lilium*
 Lily, Aſphodel, *see Hemerocallis and*
Crinum
 Lily, Daffodil, *see Pancratium and Ama-*
ryllis
 Lily, the Belladonna, *see Amaryllis*
 Lily, the Day, *see Hemerocallis*
 Lily, St. Bruno's, *Id.*
 Lily, the Guernſey, *see Amaryllis*
 Lily, Hyacinth, *see Scilla*

Lily, the May, *see Convallaria*
 Lily, the Mexican, *see Amaryllis*
 Lily of Japan, *Id.*
 Lily, the Perſian, *see Fritillaria*
 Lily, the Superb, *see Glorioſa*
 Lily, the Water, *see Nymphæa*
 Lime-tree, *see Tilia*
 Lime, the ſour, *see Limon*
 Lions Leaf, *see Leontice*
 Lions Foot, *see Catananche*
 Lions Tail, *see Leonurus*
 Liquidamber
 Liquorice, *see Glycirrhiza*
 Liquorice-vetch, *see Orobus*
 Liquorice, the Wild, *see Aſtragalus*
 Live-ever, *see Anacamperos and Semper-*
vivum
 Live in Idleneſs, *see Viola*
 Liver-wort, *see Hepatica and Lichen*
 Lizards-tail, *see Saururus*
 Loam
 Locker, Goulons, *see Trollius*
 Locuſt, or St. John's Bread, *see Cera-*
tonia
 Locuſt, the Baſtard, *see Hymenæa*
 Locuſt of Virginia, *see Gleditſia*
 Logwood, *see Hæmatoxylum*
 London Pride, *see Saxifraga*
 Looking Glaſs, Venus's, *see Campanula*
 Loofetriſe, *see Lyſimachia*
 Loofetriſe, the podded, *see Epilobium*
 Loofetriſe, the ſpiked, *see Lythrum*
 Lopping
 Lote-tree, *see Celtis*
 Lote, the Baſtard, *see Dioſpyrus*
 Love apple, *see Lycoperſicum and Sola-*
num
 Love in-a-milt, *see Paſſiflora*
 Love-lies-a-bleeding, *see Amaranthus*
 Loveage, *see Liguſticum*
 Loufewort, *see Delphinium*
 Lucern, *see Medica*
 Lungwort, *see Pulmonaria*
 Lungwort, Cows, *see Verbaſcum*
 Lupine, *see Lupinus*
 Luitwort, *see Droſera*

M.

Maccaw-tree, *see Palma*
 Mad Apple, *see Melongena*
 Madder, *see Rubia*
 Madder, Petty, *see Aſperula*
 Madwort, *see Alyſſum*
 Mahogany, *see Cedrus*
 Maiden Hair, *see Aſianthum*
 Maiden Hair, the Black, *see Filicula*
 Maiden Hair, the Engliſh, *see Tricho-*
manes
 Maiden Hair, the White, *see Ruta mu-*
raria
 Malabar Nut, *see Juſticia*
 Male Baſam Apple, *see Momordica*
 Mallow, *see Malva*
 Mallow, the Jews, *see Corchorus*
 Mallow, the Indian, *see Urena and Sida*
 Mallow, the Maſh, *see Althæa*
 Mallow, the Roſe, *see Alcea*
 Mallow, the Syrian, *see Elyſium*

Pea, *see Pisum*
 Peach, *see Persica*
 Peach, the Wolf's, *see Lycopersicon*
 Pear-tree, *see Pyrus*
 Peas, Earth Nut, *see Lathyrus*
 Peas, Everlasting, *Id.*
 Peas, the Heart, *Cardiospermum*
 Peas, the Pigeon, *see Cytisus*
 Peas, the winged, *see Lotus*
 Pellitory of the Wall, *see Parictaria*
 Pellitory of Spain, *see Anthemis*
 Pellitory, the Double, *see Achillea*
 Penguin, *see Karatas*
 Pennyroyal, *see Pulegium*
 Pennywort, *see Cotyledon*
 Pennywort, the Marsh, *see Hydrocotyle*
 Peony, *see Peonia*
 Pepper, the Jamaica, *see Caryophyllus*
 Pepper, the Poor Man's, *see Lepidium*
 Pepper, the Indian, *see Capsicum*
 Pepper, the Wall, *see Sedum*
 Pepper, the Water, *see Persicaria*
 Pepper-mint, *see Mentha*
 Pepperwort, *see Lepidium*
 Perennial Plants
 Periwinkle, *see Vinca*
 Pestilencewort, *see Petasites*
 St. Peter's-wort, *see Ascyrum and Hypericum*
 Petty-whin, *see Ulex*
 Pheasant's Eye, *see Adonis*
 Pheasant-eye Pink, *see Dianthus*
 Physick Nut, *see Iatropa*
 Pigeon Pea, *see Cytisus*
 Pilewort, *see Ranunculus*
 Pimento, or Jamaica Pepper, *see Caryophyllus*
 Pimpernel, *see Anagallis*
 Pimpernel, the Water, *see Samolus*
 Pimpillo, *see Castos*
 Pimpinell, *see Pimpinella and Sanguisorba*
 Pineaster, *see Pinus*
 Pine-apple, *see Ananas*
 Pine-tree, *see Pinus*
 Pine, the Dwarf, *see Teucrium*
 Pine, the Wild, *see Karatas*
 Pink, *see Dianthus*
 Pipe-tree, *see Syringa*
 Pipe, the Pudding, *see Cassia*
 Piperidge-tree, *see Berberis*
 Pithamin, or Persimon, *Diospyros*
 Pistacia
 Pitch-tree, *see Abies*
 Plane-tree, *see Platanus*
 Plane-tree, the false, *see Accr*
 Plantain, *see Plantago*
 Plantain, the Buckthorn, *Id.*
 Plantain-tree, *see Musa*
 Plaintain Shot, *see Canna*
 Planting
 Pliant meally Tree, *see Viburnum*
 Plowing
 Plowman's Spikenard, *see Conyza*
 Plumb-tree, *see Prunus*
 Plumb, the American, *see Chrysobalanus*
 Plumb, the Black, *Id.*
 Plumb, the Hog, *see Spondias*
 Plumb, the Maiden, *see Chrysobalanus*
 Plumb, the Indian Date, *see Diospyros*

Pocoon, *see Sanguinaria*
 Pockwood, *see Guaiacum*
 Poets Rosemary, *see Cassia*
 Poifon Aih, *see Toxicodendron*
 Poifon Oak, *Id.*
 Poifon Bush, *see Tithymalus*
 Poke, or Pork Physick, *see Phytolacca*
 Poley-mountain, *see Polium*
 Polyanthus, *see Primula*
 Polypody, *see Polipodium*
 Pomegranate, *see Punica*
 Pondweed, *see Potamogeton*
 Poor Man's Pepper, *see Lepidium*
 Poplar-tree, *see Populus*
 Poppy, *see Papaver*
 Poppy, the Horned, *see Chelidonium*
 Poppy, the Prickly, *see Argemone*
 Poppy, the Spatling, *see Cucubalus*
 Potatoes, *see Lycopersicon*
 Potato, the Spanish, *see Convolvulus*
 Prickly Pear, *see Opuntia and Cactus*
 Prick Madam, *see Sedum*
 Prick Timber, *see Euonymus*
 Priest's Pintle, *see Arum*
 Primrose, *see Primula*
 Primrose-tree, *see Oenothera*
 Primrose, the Night, *Id.*
 Privet, *see Ligustrum*
 Privet, the Mock, *see Phillyrea*
 Pruning
 Pudding Grass, *see Pulegium*
 Pudding Pipe-tree, *see Cassia*
 Pumkin, *see Pepo*
 Purging Nut, *see Iatropa*
 Purplewort, *see Trifolium*
 Purslane, *see Portulaca*
 Purslane, the Sea, *see Atriplex and Chenopodium*

Q.

Quaking Grass, *see Gramen*
 Queen's Gilliflower, *see Hesperis*
 Queen of the Meadow, *see Spiraea*
 Quick, *see Mespilus*
 Quickbeam, *see Sorbus*
 Quicken-tree, *Id.*
 Quince-tree, *see Cydonia*

R.

Radish, *see Raphanus*
 Radish, the Horse, *see Cochlearia*
 Ragwort, *see Othonna*
 Ragged Robin, *see Lychnis*
 Rampion, *see Campanula*
 Ramsons, *see Allium*
 Rape, *see Rapa*
 Rape, the Wild, *see Sinapis*
 Rape, the Broom, *see Orobanche*
 Raspberry, *see Rubus*
 Rattle Grass, *see Rhinanthus*
 Redwood, *see Ceanothus*
 Reed, *see Arundo*
 Reed, the Indian flowering, *see Canna*
 Restharrow, *see Ononis*
 Rhubarb, *see Rhecum*
 Rhubarb, the Monk's, *see Rumex*
 Ribwort, *see Plantago*

Rice, *see Oryza*
 Robin, Wake, *see Arum*
 Rocket, *see Eruca*
 Rocket, the Corn, *see Bunias*
 Rocket, the Garden, *see Hesperis*
 Rocket, the Winter, *see Sisybrium*
 Rock Rose, *see Cistus*
 Rose-tree, *see Rosa*
 Rose Bay, *see Nerium*
 Rose Champion, *see Agrostemma*
 Rose, the China, *see Hibiscus*
 Rose Bay, the Mountain, *see Kalmia and Rhododendron*
 Rose, the Gelder, *see Viburnum*
 Rose of Jericho, *see Anostatica*
 Rose, the South Sea, *see Nerium*
 Rose, the Rock, *see Cistus*
 Rose Root, *see Rhodiola*
 Rosemary, *see Rosmarinus*
 Rue, *see Ruta*
 Rue, Dog's, *see Scrophularia*
 Rue, the Goat's, *see Galega*
 Rue, the Meadow, *see Thalictrum*
 Rue, the Wall, *see Ruta muraria*
 Rue, the Syrian, *see Peganum*
 Rupturewort, *see Herniaria*
 Rush, *see Juncus*
 Rush, the flowering, *see Butomus*
 Rye, *see Secale*
 Rye Grass, *see Gramen*

S.

Saffron, *see Crocus*
 Saffron, the Bastard, *see Carthamus*
 Saffron, the Meadow, *see Colchicum*
 Sage, *see Salvia*
 Sage of Jerusalem, *see Phlomis*
 Sage, the Indian Wild, *see Lantana*
 Sage-tree, *see Phlomis*
 Sage, the Wood, *see Teucrium*
 Saintfoin, *see Onobrychis*
 Saltwort, *see Salicornia and Salsole*
 Sallow, *see Salix*
 Salomon's Seal, *see Cornwallaria*
 Samphire, *see Crithmum*
 Sanicle, *see Saxifraga*
 Sanicle, the Bear's Ear, *see Cortusa*
 Sappadilla, *see Chrysophyllum*
 Saracens Confound, *see Solidago*
 Sassafras, *see Laurus*
 Sattin, the White, *see Lunaria*
 Satyrium, *see Orchis*
 Sauce-alone, *see Erysimum*
 Savin, *see Juniperus*
 Savin, the Indian, *see Baubinia*
 Savory, *see Satureja*
 Saw-wort, *see Serratula*
 Saxifrage, *see Saxifraga*
 Saxifrage, the Burnet, *see Pimpinella*
 Saxifrage, the Golden, *see Chrysofle-num*
 Saxifrage, the Meadow, *see Feucedanum*
 Scabious, *see Scabiosa*
 Scarlet Lychnis, *see Lychnis*
 Scarlet, Cardinal Flower, *see Ranuncium*
 Scarlet Oak, *see Quercus*
 Sciatica Cross, *see Lepidium*

Scorching Fennel, *see Thapsia*
 Scorpion Grass, or Caterpillar, *see Scorpion*
 Scorpion Senna, *see Coronilla*
 Scull Cap, *see Scutellaria*
 Scurvy Grass, *see Cochlearia*
 Sea Buckthorn, *see Hippophae*
 Sea Cabbage, *see Crambe*
 Sea Colewort, *see Convolvulus*
 Sea Lavender, *see Limonium*
 Sea Pink, *see Statice*
 Seeds
 Self-heal, *see Prunella*
 Seminary
 Senna, the Bastard, *see Cassia*
 Senna, the Bladder, *see Colutea*
 Senna, the Jointed-Podded, *see Coronilla*
 Senna, the Scorpion, *Id.*
 Sengreen, or Houseleek, *see Sedum and Sempervivum*
 Sensitive Plant, *see Mimosa*
 Sermountain, *see Laserpitium*
 Serpents Tongue, *see Ophioglossum*
 Service-tree, *see Sorbus*
 Service, the Wild, *see Crataegus*
 Setwell, *see Valeriana*
 Setterwort, or Bear's Foot, *see Helleborus*
 Shaddock, *see Aurantium*
 Shave Grass, *see Equisetum*
 Shepherd's Needle, *see Scandex*
 Shepherd's Pouch, *see Alysson*
 Shepherd's Staff, *see Dipsacus*
 Side-saddle Flower, *see Sarracena*
 Silk Grass, *see Aloe and Apocynum*
 Silk Grass of Virginia, *see Periploca*
 Silver Bush, *see Anthyllis*
 Silver-tree, *see Protea*
 Silver Weed, *see Potentilla*
 Skirret, *see Sium*
 Slipper, the Lady's, *see Cypripedium*
 Sloe-tree, *see Prunus*
 Smallage, *see Apium*
 Snail Trefoil, *see Medicago*
 Snakeweed, *see Bistorta*
 Snakeroot, *see Aristolochia*
 Snakeroot, the Rattle, *see Polygala*
 Snapdragon, *see Antirrhinum*
 Snapdragon of America, *see Ruellia*
 Snap-tree, *see Jusficia*
 Sneezewort, *see Achillea*
 Snowdrop, *see Galanthus*
 Snowdrop-tree, *see Chionanthus*
 Soldanel, *see Soldanella*
 Soldier, the fresh Water, *see Stratiotes*
 Sopeberry, *see Sapindus*
 Sopewort, *see Saponaria*
 Sorrel, *see Rumex*
 Sorrel, the Indian, *see Hibiscus*
 Sorrel, the Wood, *see Oxalis*
 Soursop, *see Annona*
 Southernwood, *see Abrotanum*
 Sowbread, *see Cyclamen*
 Sow Thistle, *see Sonchus*
 Spanish Nut, *see Sisyrrinchium*
 Spanish Arbor Vine, *see Convolvulus*
 Spanish Elder, *see Saururus*
 Spanish Rosemary, *see Passerina*
 Spanish Broom, *see Genista and Spartium*

Spanish Picktooth, *see Daucus*
 Spanish Majoram, *see Urtica*
 Sparrowgrass, *see Asparagus*
 Spatling Poppy, *see Cucubalus*
 Spear, the King's, *see Asphodelus*
 Spearwort, *see Ranunculus*
 Spear-mint, *see Mentha*
 Spearage, *see Asparagus*
 Speedwell, *see Veronica*
 Spiderwort, *see Phalangium, Anthericum, and Ephemelum*
 Spignel, *see Athamanta*
 Spike Lavender, *see Lavendula*
 Spinach, *see Spinacia*
 Spindle-tree, *see Euonymus*
 Spindle-tree, the African, *see Celastrus*
 Spleenwort, *see Asplenium*
 Spleenwort, the Rough, *see Lonchitis*
 Spoonwort, *see Cochlearia*
 Spurge Laurel, *see Daphne*
 Spurge Olive, *see Cneorum*
 Spurry, *see Spargula*
 Squashes, *see Cucurbita*
 Squill, *see Scilla*
 Staghorn tree, *see Rhus*
 Star Apple, *see Chrysophyllum*
 Star of Bethlehem, *see Ornithogalum*
 Star Hyacinth, *see Scilla*
 Star of Naples, *Id.*
 Star Thistle, *see Centaurea*
 Starwort, *see Aster*
 Starwort, the Yellow, *see Inula*
 Stickadore, *see Stachas*
 Stockgill flower; *see Cheiranthus*
 Stockgillflower, the Dwarf, *see Hesperis*
 Stone-break, *see Alchemilla*
 Stone-crop, *see Sedum*
 Stone crop Tree, *see Chenopodium*
 Storax-tree, *see Styrax*
 Storax, the Liquid, *see Liquidamber*
 Stove
 Strawberry, *see Fragaria*
 Strawberry Blite, *see Blitum*
 Strawberry Spinach, *Id.*
 Strawberry-tree, *see Arbutus*
 Succory, *see Cichorium*
 Succory, the Gum, *see Chondrilla*
 Sugar Cane, *see Saccharum*
 Sugar Maple, *see Acer*
 Sulphur wort, *see Peucedanum*
 Sultan Flower, *see Centaurea*
 Sumach, *see Rhus*
 Sumach, the Coriars, *Id.*
 Sumach, the Venetian, *Id.*
 Sumach, the Myrtle-leaved, *see Coriaria*
 Sun Dew, *see Drosera*
 Sun flower, *see Helianthus*
 Sun-flower, the Dwarf, *see Rudbeckia*
 Sun-flower, the Willow-leaved, *see Helenium*
 Sun-spurge, *see Euphorbia*
 Swallow-wort, *see Asclepias*
 Sweet Apple, *see Annona*
 Sweet Johns, *see Dianthus*
 Sweet William, *Id.*
 Sweet William of Barbadoes, *see Ipomoea*
 Sweet Willow, *see Myrica*
 Swines Cress, *see Cochlearia*

Sycamore, *see Acer*
 Sycamore, the false, *Id.*

T.

Tamarind, *see Tamarindus*
 Tamarisk, *see Tamarix*
 Tan
 Tansey, *see Tanacetum*
 Tansey, the Wild, *see Potentilla*
 Tare, *see Kicia*
 Tarragon, *see Abrotanum*
 Tea, the South Sea, *see Cassine*
 Teasel, *see Dipsacus*
 Thistle, *see Carduus*
 Thistle, the Blessed, *see Cnicus*
 Thistle, the Carlite, *see Carlina*
 Thistle, the Distaff, *see Atractylis*
 Thistle, the Fish, *Id.*
 Thistle, the Fuller's, *see Dipsacus*
 Thistle, the Globe, *see Echinops*
 Thistle, the Ladies, *see Carduus*
 Thistle, the Melon, *see Cactus*
 Thistle, the Melancholy, *see Cirsium*
 Thistle, the Milk, *see Carduus*
 Thistle, the Sow, *see Sonchus*
 Thistle, the Star, *see Centaurea*
 Thistle, the Torch, *see Cactus*
 Thorn Apple, *see Datura*
 Thorn, the Black, *see Prunus*
 Thorn, the Box, *see Lycium*
 Thorn, Christ's, *see Paliurus*
 Thorn, Cockspur, *see Crataegus*
 Thorn, the Egyptian, *see Acacia*
 Thorn, the Ever-green, *see Mespilus*
 Thorn, the Glasfenbury, *Id.*
 Thorn, the Goat's, *see Tragacantha*
 Thorn, the Haw, *see Crataegus*
 Thorn, the Purging, *see Rhamnus*
 Thorn, the White, *see Crataegus*
 Thorough-wax, *see Bupleurum*
 Three-leaved Grass, *see Trifolium*
 Thrift, *see Statice*
 Throatwort, *see Thracelium and Campanula*
 Thyme, *see Thymus*
 Thyme, the Lemon, *Id.*
 Thyme, the Mastich, *see Satureja*
 Toad-flax, *see Linaria*
 Tobacco, *see Nicotiana*
 Tooth-pick, *see Daucus*
 Tooth-wort, *see Dentaria*
 Tormentil, *see Tormentilla*
 Touch me-not, *see Impatiens*
 Tower Mustard, *see Turritis*
 Traces, Lady's, *see Orchis*
 Traveller's Joy, *see Clematis*
 Trefoil, *see Trifolium*
 Trefoil, the Bean, *see Cytisus*
 Trefoil, the Bird's-foot, *see Lotus*
 Trefoil, the Marsh, *see Meniantes*
 Trefoil, the Moon, *see Medica*
 Trefoil-shrub, *see Dorycnium and Ptelea*
 Trefoil, the Snail, *see Medicago*
 Trefoil, the Star-headed, *see Trifolium*
 Trefoil, the Strawberry-headed, *Id.*
 Treacle Mustard, *see Thlaspi and Iberis*
 Tree, the Cork, *see Quercus*
 Tree, the Chaste, *see Vitex*

I N D E X.

Tree, Germander, *see Teucrium*
 Tree, the Indian God, *see Ficus*
 Tree, the White-leaf, or Meally, *see Viburnum*
 Tree of Life, *see Thuya*
 True love, *see Paris*
 Trumpet Flower, *see Bignonia*
 Trumpet Honeysuckle, *see Periclymenum*
 Tuberoſe, *see Polianthes*
 Tulip, *see Tulipa*
 Tulip, the African, *see Hæmanthus*
 Tulip-tree, *see Tulipifera*
 Tulip tree, the Laurel-leaved, *see Magnolia*
 Tunhoof, or Ground-ivy, *see Glecoma*
 Turbith, *see Thapſia*
 Turks-cap, *see Lilium*
 Turk's head, *see Cactus*
 Turkey Baulm, *see Dracocephalon*
 Turkey Wheat, *see Zea*
 Turnep, *see Rapa*
 Turnep, the French, *Id.*
 Turnep Cabbage, *see Brassica*
 Turnſol, *see Helictropium*
 Turpentine-tree, *see Piſtacia*
 Turpentine, the Venice, *see Larix*
 Tatſan, *see Hypericum*
 Twyblade, *see Ophris*

V.

Valerian, *see Valeriana*
 Valerian, the Greek, *see Polemonium*
 Vegetable
 Vegetation
 Venus Comb, *see Scandix*
 Venus Looking-glaſs, *see Campanula*
 Venus Navelwort, *see Cynogloſſum*
 Vervain, *see Verbenæ*
 Vervain Mallow, *see Alcea*
 Vetch, *see Vicia*
 Vetch, the Bitter, *see Orobus*

Vetch, the Chichling, *see Lathyrus*
 Vetch, the Crimſon-graſs, *Id.*
 Vetch, the Hatchet, *see Securidaca*
 Vetch, the Horſe-ſhoe, *see Hippocrepis*
 Vetch, the Kidney, *see Vulneraria*
 Vetch, the Liquorice, *see Glycine*
 Vetch, the Medic, *see Aſtragalus*
 Vetchling, *see Aphaca*
 Vine, *see Vitis*
 Vine, the Black, *see Tamus*
 Vine, the Spaniſh Arbor, *see Convolvulus*
 Vine, the White, *see Bryonia*
 Violet, *see Viola*
 Violet, the Dame's or Queen's, *see Heſperis*
 Violet, the bulbous, *see Galanthus*
 Violet, the Dog's Tooth, *see Erythronium*
 Violet, the Corn or Venus Looking-glaſs, *see Campanula*
 Viper's Bugloſs, *see Echium*
 Viper's Graſs, *see Scorzonera*
 Virgin's Bower, *see Clematis*
 Virginian Silk, *see Periploca*
 Virginian Acacia, *see Robinia*

W.

Wake Robin, *see Arum*
 Walks
 Walls
 Wallflower, *see Cheiranthus*
 Wallwort, or Dwarf Elder, *see Sambucus*
 Walnut, *see Juglans*
 Wartwort, *see Euphorbia*
 Water
 Water Calamint, *see Mentha*
 Water Creſs, *see Siſymbrium*
 Water Dropwort, *see Oenanthe*
 Water Germander, *see Teucrium*
 Water Hemp Agrimony, *see Bidens*
 Water Horehound, *see Lycopus*
 Water Lily, *see Nymphaea*

Water Parsnep, *see Sium*
 Water Pepper, *see Perſicaria*
 Way-faring Tree, *see Viburnum*
 Weeds
 Weed, the Dyers, *see Reſeda*
 Weld, or Would, *Id.*
 Wheat, *see Triticum*
 Wheat, the Cow, *see Melampyrum*
 Wheat, the French, *see Helixia*
 Wheat, the Indian, *see Zea*
 Whicken, or Quickbeam, *see Sorbus*
 Whins, or Goſe, *see Ulex*
 Whortlebury, *see Vaccinium*
 Widow-wail, *see Cneorum*
 Wilderneſs
 Willow-tree, *see Salix*
 Willow, the Dutch, or Sweet, *see Myrica*
 Willow, the French, *see Epilobium*
 Willow Herb, *see Lythrum*
 William's ſweet, *see Dianthus*
 Wind Flower, *see Anemone*
 Wind Seed, *see Arctotis*
 Wine
 Winter Aconite, *see Helleborus*
 Winter Cherry, *see Phyſalis*
 Winter Creſs, *see Siſymbrium*
 Winter Green, *see Pyrola*
 Witch Hazel, *see Ulmus and Hamamelis*
 Woad, *see Iſatis*
 Wolfsbane, *see Aconitum*
 Woodbine, *see Periclymenum*
 Woodroof, *see Aſperula*
 Wood Sage, *see Teucrium*
 Wood Sorrel, *see Oxalis*
 Woody Nightshade, *see Solanum*
 Wormwood, *see Abſinthium*
 Woundwort, *see Vulneraria*
 Woundwort, *see Solidago*
 Woundwort of Achilles, *see Achillea*

Y.

YARROW, *see Achillea*
 Yarrow, the Water, *see Hottonia*

T H E E N D.

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BY PHILIP MILLER, F. R. S.

Member of the Botanick Academy at *Florence*, and Gardener to the Worshipful Company of APOTHECARIES, at their Botanick Garden at *Chelfea*.

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EXTRACT from the PREFACE.

THE Author, in the Execution of this Work, confined his Plan to those Plants only, which are either curious in themselves, or may be useful in Trades, Medicine, &c. including the Figures of such new Plants as have not been noticed by any former Botanists, by which all those Genera of Plants, which do not include any Species having one or other of these Properties, are omitted.

In the Execution of the Work no Expence has been spared to render it as perfect as possible: The Drawings were taken from the living Plants; the Engravings were most of them done under the Author's Inspection; and the Plants have been carefully coloured from the original Drawings, and compared with the Plants in their Perfection, wherever it could be done, as well with regard to the Leaves as Flowers, that so Gentlemen who are least conversant with the Plants described, should not be drawn into any Mistake relating to them; and the less, as he has taken their Descriptions from the living Plants.

To these Figures are added the Characters of the Genus, under which each Plant is ranged, and an Account of the Classes to which they belong, according to *Ray's*, *Tournefort's*, and *Linnaeus's* Methods of classing them; and also the several Titles which the different Writers on Botany have given to them, with References to the several Books wherein they are mentioned.

The *English* Names (of those Plants which have any) are subjoined to the *Latin* Titles, for the Benefit of such as are unacquainted with *Latin*, and to these are added the *French* Names from *Tournefort's* Institutions of Botany: And mention is also made of the Countries from whence the Plants have been brought to *England*, which will be of some Use to those who are inclinable to cultivate them. And where any of the Plants here figured are of Use in Medicine, or for other Purposes of Life, the Uses are here inserted, with the Times of their Flowering, and perfecting their Seeds: So that, although this Work was intended for an Appendix to the GARDENERS DICTIONARY, yet it may be reckoned a complete Performance of itself, independent of that.

The following is an Alphabetical List of the *English* Names of the PLANTS, engraved and described in the above-mentioned Work.

T H E

ENGLISH NAMES of the PLANTS

Engraved and Described in the above-mentioned W O R K.

A Acacia, without Thorns
 Acacia, the American
 Acacia, the Narrow-leaved
 Acacia, the False
 Adonis Flower
 Agave
 Agrimony
 Agrimony, the Waterhemp
 Alkanet
 Almond-tree
 Aloe, African
 Amaranthus, spiked
 Amaryllis
 Anemomy
 Arctotis
 Arsmart
 Arum
 Astarabaca common
 Asparagus
 Asphodel
 Balsamine, Female
 Barbadoes Cherry
 Barberry Bush
 Barrenwort
 Bacteria
 Bastard Lychnis
 Bastard Asarum
 Baulm, the Turkey
 Bean Caper
 Bear's Breech
 Bear's Ear
 Bindweed
 Bird Cherry
 Bird's Eye
 Bird's Foot Trefoil
 Birthwort
 Bishop's Weed
 Bitter Vetch
 Bladder Pea
 Bladder Sena
 Blue Bottle
 Borage
 Boxthorn
 Boxthorn
 Briony white
 Broom
 Broom, the Green
 Browallia
 Bugloss
 Bulbocodium
 Burdock
 Calve's Snout
 Cammock
 Campion
 Cassidony

Cassioberry
 Catchfly
 Caterpillar
 Celandine
 Centaury
 Chaste-tree
 Cheese-Runnet
 Chelone
 Cherry
 Chesnut
 Chickling Pea
 Chickweed, Berry-bearing
 Chrysanthemum Hardseeded
 Climber
 Clethra
 Cnicus
 Colutea, joint-podded
 Colutea Shrubby, jointed-podded
 Columbine
 Convolvulus, Scarlet
 Corn Flag, Strange
 Corn Flag, greater Byzantine
 Corn Flag, African
 Corn Flag, African
 Corn Flag
 Cotton Weed
 Cowslip Chickweed
 Cranebill
 Crowfoot
 Crown Imperial
 Cuckow-Pint
 Cunonia, the Scarlet
 Custard Apple
 Daffodil Sea
 Daffodil Lily
 D'Ayena, Smooth
 Date Plum, Indian
 Dead Nettle
 Dianthus
 Diervilla
 Diosma
 Dittany, the White
 Dodartia
 Dogbane
 Dogbane upright
 Dogwood
 Dragon
 Dragon's Head
 Dropwort
 Dwarf Cistus
 Ebony-Mountain
 Elder
 Emony
 Eternal Flower
 Eupatorium of the Greeks

Felwort
 Fennel Flower
 Ferrara
 Field Basil
 Figwort
 Fir, or Spruce-tree
 Flax
 Fleabane
 Flower de Luce
 Flower Gentle
 Foxglove
 Fraxinella
 Fumitory, the podded
 Fumitory
 Furze
 Gentian
 Germander
 Gilliflower
 Globe Amaranthus
 Globe Thistle
 Goats Rue
 Golden Rod
 Goldylocks
 Groundsel
 Gundelia
 Hare's Ear
 Hartwort
 Hatchet-vetch
 Hawkweed
 Hawkweed, Greater
 Hawthorn
 Hellotrope
 Hellebore, the Bastard
 Hellebore, the White
 Hemp
 Henbane
 Holly-tree
 Honeyfuckle
 Honeyfuckle, the Upright
 Honeyly
 Honeywort
 Horse Chesnut, the Scarlet
 Hyacinth Eastern
 Hyacinth, the Tuberose
 Hydrangea
 Hypecoon
 Jasmine
 Jasmine, the Persian
 Jerusalem Sage
 Jersey Tea
 Immortal Flower
 Indian Fig
 Indigo Bastard
 Indigo
 St. John's Wort

ENGLISH NAMES of the PLANTS.

Ironwood	Nightshade, the Deadly	Spiræa
Judas-tree	None so pretty	Spotted Sanicle
Ixia	Oak	Staff-tree
Kingspear	Oil-feed	Star of Bethlehem
Knapweed	Orpine, the Lesser	Starwort Carolina
Knapweed	Othonna	Starwort American
Ladies Bedstraw	Ox-eye	Storax-tree
Ladies Slipper	Parsley, the Bastard	Strawberry
Larkspur, Great Bee	Pellitory of Spain	Strawberry-tree
Larkspur taller, perennial	Pentapetes	Sumach, the Venetian
Lavatera	Perriwinkle	Sun-flower, the Dwarf
Lavender Cotton	St. Peter's-wort	Swallow-wort
Laurel, the Rose, or Mountain	Pheasant's Eye	Sweetwilliam
Leopards-bane	Phlox	Tacamahac-tree
Lettuce	Phytolacca	Tamarisk
Lilac	Pine-tree	Tame Poison
Lily	Pink	Ttr agonia
Lily Asphodel	Piony	Thistle, the Torch
Lily Daffodil	Pipe-tree	Thistle, Melancholy
Lily, the Mexican	Pipperish Bush	Thistle, the Golden
Lion's Tail	Poke. or Pork Physic	Thistle, Woolly
London Pride	Polyanthes	Thorn, the Egyptian
Lungwort	Pomegranate	Toad-flax
Lupine	Poppy, the Prickly	Tobacco
Madwort	Poppy the Horned	Trefoil, the Bean
Magnolia	Primrose-tree	Trefoil, Carolina Shrub
Malabar Nut	Privet	Trefoil, Star-headed
Mallow, the Yellow Marsh	Punica	Triumfetta
Mallow, the Vervain	Quince	Trumpet-flower
Malpighia	Ranunculus	Tulip-tree, the Laurel-leaved
Mandrake	Ragwort foreign	Turnera
Mantle, Ladies	Raspberry	Turnsole
Maple-tree	Reitharrow	Tyger flower
Marigold	Rhubarb	Valerian, the Greek
Marigold, the Fig	Rocket, the Bastard	Venus Navel-wort
Martynia	Rock-Rose	Vetch Kidney
Mastick tree, Indian	Rose	Vetch, the Chickling
Maudlin	Saffron	Vetch, the Horse-shoe
Meadia	Sage	Vetchling
Meadow Rue	Sawwort	Wake-Robin
Meadow-sweet	Saxifrage	Warneria
Medlar	Self-heal	Water Apple
Melon, the Water	Senna, the wild	Watsonia
Mesembryanthemum	Senna, the Bladder	Watsonia, Dwarf
Milk-vetch	Senna, the Scorpion	Water Lily
Monarda	Sensitive Plant	Wayfaring-tree
Monk's Hood	Side-saddle Flower	Whin, Petty
Morea	Snake Gourd	White Satin
Moon Trefoil	Snakeweed	Widow-wail
Motherwort	Snapdragon	Wild Service
Moonwort	Solomon's Seal	Winter Cherry
Mullein	Sour Sop	Wolfsbane
Mullein, the Moth	Southernwood	Wood sorrel
Myrtle	South-Sea Tea	Woundwort
Nettle-tree	Sowbread	Yellow Root
Nightshade	Spiderwort	Zerumbeth

This Work was published in Fifty Numbers, Price Five Shillings each, coloured, or Two Shillings and Six-pence plain: And as there may be many Persons who would be glad to be in Possession thereof, who do not chuse to purchase it altogether, on Account of the Price, it may be bought by a single Number once a Week or Month, or at such other Times as suits any Gentleman and Gardeners Conveniency to purchase it.

