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A GENERAL
T R E A T I S E
O F
Husbandry and Gardening.

CONTAINING

Such Observations and Experiments
as are New and Useful for the Im-
provement of Land.

W I T H

An Account of such extraordinary In-
ventions, and natural Productions, as may
help the Ingenious in their Studies, and pro-
mote universal Learning.

V O L. III.

With Variety of curious CUTTS.

By RICHARD BRADLEY,
Fellow of the Royal Society.

L O N D O N :

Printed for T. WOODWARD, at the Half-Moon
against St. Dunstan's Church, Fleet - Street ;
and J. PEELE, at Locke's Head in Pater-
Noster Row. M.DCC.XXIV.

1880

THEATRE

1880

Library and Catalogue

1880

Good Observations and Experiments
on the Nature of the Human Mind



By the Rev. John Locke
M.A. Fellow of the Society of Christ Church
Oxford

1880

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mote universal Learning.

With Variety of curious CUTTS.
For the Months of APRIL and MAY,
The Second Year.

By RICHARD BRADLEY,
Fellow of the Royal Society.

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A GENERAL

TREATISE

OF

WILLS AND TESTAMENTS

BY

JOHN WILLIAMS, ESQ.,
OF THE MIDDLE TEMPLE, BARRISTER AT LAW.

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TO THE
RIGHT HONOURABLE
ROBERT WALPOLE, *Esq;*
*First Lord-Commissioner of
the Treasury, Chancellor
of the Exchequer, &c. &c.*

S I R,



THE Reasons which encourage me to hope for Your Protection of the following Papers, are founded upon Your gene-

The Dedication.

rous Character, which declares You the Patron of every Thing which tends to the Advantage or Improvement of Your Country ; and it is no small Happiness, that after great Expence and Study, I have an Opportunity of presenting a Gentleman of Your polite Taste with some New Discoveries, which will gain Time in raising Plantations, and fill our Gardens with Fruit at every Season of the Year ; which I hope will afford You some Amusement in Your Leisure Minutes, especially since Your Genius has led You to purchase one of the finest Collections of Plants in the Kingdom.

This, *Sir*, is Engagement enough for me to offer the following
Sheets

The Dedication.

Sheets to Your Perusal, and that I
may have the Honour of declaring to
the World that I am, with the
greatest Respect,

S I R,

Your Most Obedient

Humble Servant,

R. BRADLEY



P R E F A C E.



S this Work wears a different Title, from my former Monthly Treatise of Husbandry and Gardening, it is necessary I should say a Word or two by way of Preface concerning it. When I undertook the last Year's Memorandums, relating to the Improvement of the landed Estates, the Observations were chiefly my own; and my Intent was then not only to render them useful, but to establish a general Correspondence among all the curious Men in Britain, in Order to raise these Arts to a much higher Pitch than ever they were before. This Undertaking has had that good Fortune, that several curious Societies of ingenious Men, are now become correspondent with one another, and by their assisting each other in making Experiments and Observations; we have Room to expect many extraordinary Discoveries, which may be brought into general Practice, and prove greatly useful to the Publick.

This no Person singly could have ever brought to pass; for neither could a single Purse go throw such a Design, nor one alone endure

P R E F A C E

endure the Fatigue of perswading a People to step out of their common Road, tho' it would be never so much for their Advantage. As Experiments in these Arts, require some Time to give Evidence of their Worth, so it could not be expected that all the Queries which were propos'd and sent to me the last Year, could be answer'd in the Compass of Time, in which my monthly Papers were publishing.

Since I have now prevail'd upon the Curious in several Counties in England, to establish Societies, and hold Correspondence with one another; whereby whatever is found of publick Use, may be inserted in such a Register, to the Honour of the Discoverer, and for the Welfare of every Particular. In such an Undertaking, it will appear that I shall act rather as a Secretary, than as a Director, by communicating what Discoveries come to my Hands, from one Society to the rest, and shall take what Care I can, to bring them abroad correct and perfect.

I take this Opportunity of acknowledging my Obligations for many Remarks and ingenious Discoveries, communicated by several noble and curious Personages, which were inserted in my monthly Papers for the last Year. The Letters which yet remain in my Hands unanswer'd, will be explain'd in this Work, as soon as the Experiments made upon them are perfected.

T H E

Fig. 1.

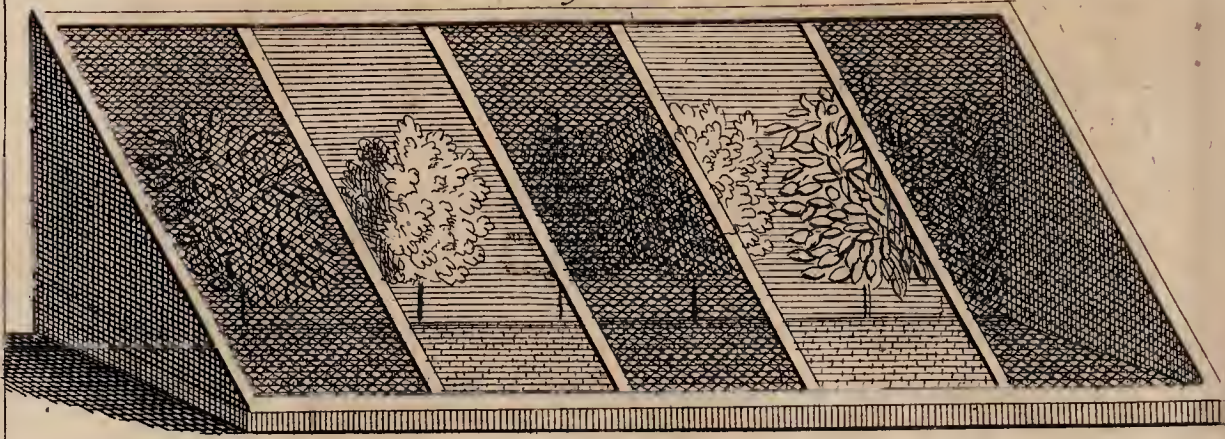


Fig. 2.

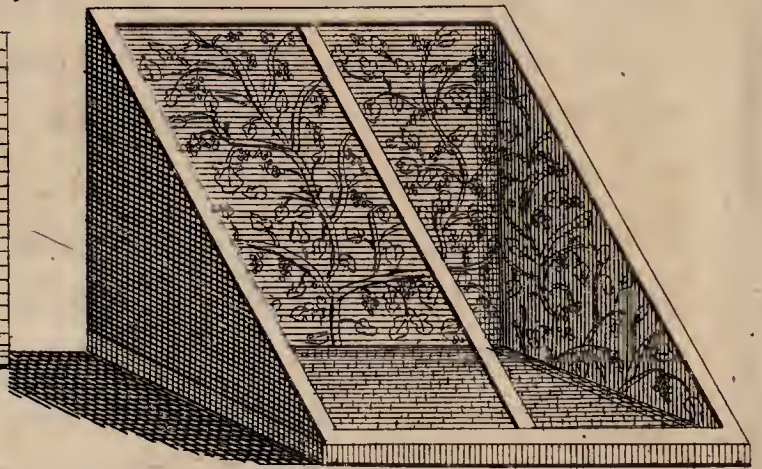
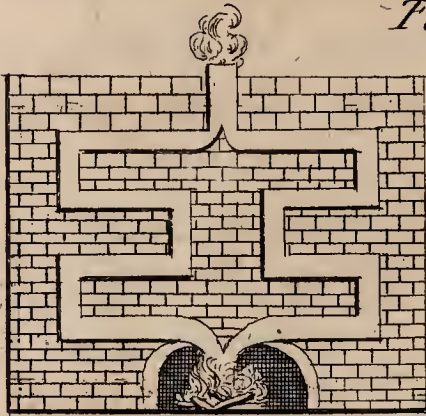
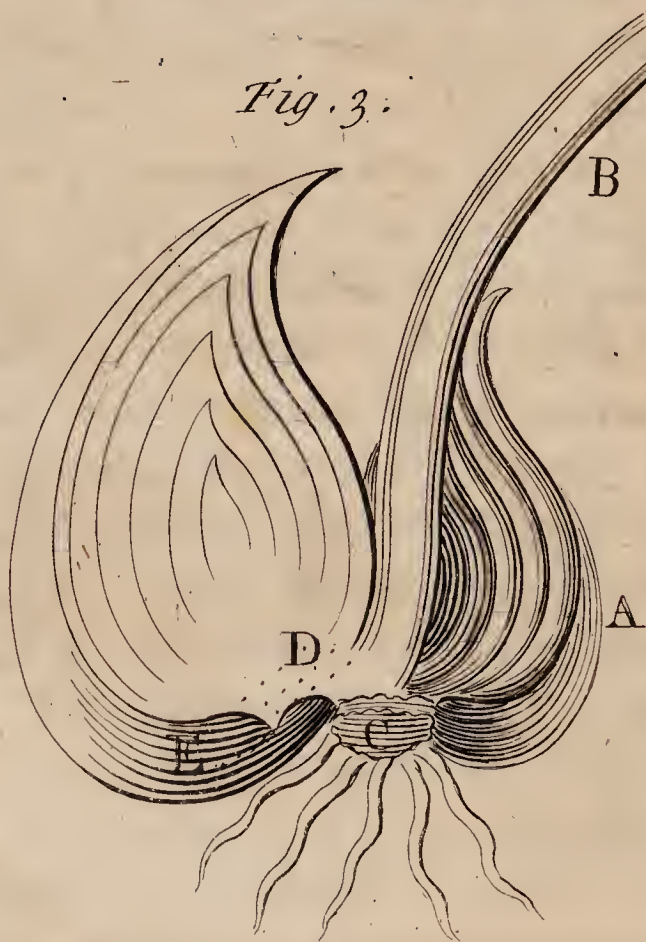


Fig. 3.





THE
Monthly Register
OF
EXPERIMENTS
AND
OBSERVATIONS
IN
Husbandry and Gardening.

For the Month of APRIL, 1722.

*The Method of Making and Ordering such
a Garden as will bring Fruits and Herbs
for Table-Use in uncommon Seasons.*



HAVE been now about a
Twelve Month collecting such
Examples in the Way of for-
warding and retarding the Ri-
pening of Fruits, as may give them to
B us

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us in those Seasons when Nature is unactive among Vegetables, or does not of her own Accord produce any Fruit : I mean the Months of *November, December, January, February, March, and April.* These Months are stiled in *England*, the Dead Months, because there is then no Fruit Naturally growing upon the Ground, tho' in Countries nearer the Equinoctial there are several Excellent Fruits ripe in these Months, without any Art; so much Influence has the Sun then in the Southern Parts, that they rejoyce in their Natural Fruits when our Gardens are vacant, unless by the Help of Art.

The Methods which have been taken with us to ripen some few Fruits out of their Natural Season, have been various, and but few of them successful; but however the Artists have failed of the Perfection they aim'd at; yet, if they have had any Fruit at all, it has, for its bare Appearance Sake, in an uncommon Season, so much recreated the Minds of the Curious, that it has been enough esteem'd, to bring good Profit to the Gard'ner that rais'd it.

Mr. *John Millet*, whom I have so often mention'd on account of ripe Cherries in *February*, was the chief if not the only Gard'ner in *England*, for bringing
his

his Fruit out of Season to good Ripeness and Perfection. I have eaten in *February*, Duke Cherries, so ripe that they were almost black, and, in my Opinion, were as well tasted as any of the Summer Growth, which depended upon his just Management of them, in applying a due Heat at proper Times; but where that has not been rightly understood, and the Fruit has been forced unnaturally, or with too great Violence, it prov'd always insipid.

Some Men of Quality have, for these Reasons, advised me to publish my Thoughts concerning the Means which should be used to give them good Fruits at uncommon Seasons; and particularly one Curious Gentleman, who designs to make a Garden on purpose for such Curiosities; and this I hope to prescribe in such a Method as will not be very expensive.

The Sorts of Fruit which I shall propose are, **CHERRIES** of the Early Sorts, which bear well, *viz.*

The *May* Cherry.

The *May* Duke-Cherry.

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ABRICOTS are :

The Masculine Abricot.

The Bruxelles Abricot.

PEACHES are :

The Avant-Peach.

The Anne-Peach.

The early *Newington* Peach.

The *Albemarle* Peach.

The Brown Nutmeg.

NECTARINES are :

Mr. *Fairchild's* early Nectarine.

The *Alrouge* Nectarine.

And the *Newington* Nectarine.

CURRANS are :

The large *Dutch* White.

The large *Dutch* Red.

GOOSEBERRIES are :

The *Dutch* White.

The *Dutch* early Green Goosberry.

The Walnut Goosberry.

To these Fruits we may likewise add
Two or Three Sorts of GRAPES, as

The White and Black Sweet-water.

The large *July* Grape, whose Berries
are equal on the Bunches.

The Malmsey.

The Royal Muscadine.

The *Burgundy* Grape.

All these may be planted against a
Paling of Five Foot high, made after
the following Manner.

The Stakes to support this Paling, must
be set about Six Foot distance from one
another; to which we are to nail whole
Deal Boards of Twelve Foot long, well
jointed to one another, and plow'd on
the Edges, so as to let in Lathes, that
thereby the Steam of the Dung, which
is to lye at the Back, may not get among
the Plants, for where such Steam comes
it causes a Mildew.

The Deals if they are not quite an
Inch thick, will be apt to scorch the
Trees upon the first Application of the
hot Dung, or if they are much thicker,
the Artificial Heat apply'd to their Backs
upon the Time it begins to decline, will
not be powerful enough to warm them
thorough, and then the Dung must be
oftner refresh'd.

Thus

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Thus a Paling of 60 Foot long, will answer to Five Deals in length, and if it be somewhat above Five Foot high, will take up in all Thirty Deals.

When this is up, we may mark out a Border on the South-Side of it, about Four Foot wide; and on the Outside of the Border, we must fasten to the Ground, in a streight Line, some Scantlins of Wood about Four Inches thick, to rest the Glafs Lights upon, which are to slope back to the Paling, for sheltering the Fruit, as Occasion requires; between these Glafs Lights must be Bars cut out of whole Deal, about Four Inches wide, so made, that the Glafs Lights may rest in them. These Bars must always remain fix'd, as in a Frame for a hot Bed. But the Figure will explain the Manner of this Frame more easily to us.

If we had a mind that the Glafs Lights should not slope so much as they must by this Fall from the Upright, we may have a Line of whole Deals on the Top of the Paling, to project their whole Breadth over the Trees, and so to let the Tops of the Glafs Lights fall in an Inch or two under them.

At each End of this Frame must be a Door shaped to the Profile of the Frame,

to be open'd, either the one or the other, as the Wind happens to blow.

If a Frame of this Nature be made in the Summer Season, we may Plant it the same Summer, with the Sorts of Fruit I have mention'd, except only the Grapes; for I have not yet experienc'd whether Vines will bear transplanting in the Summer, as I have done other Trees: Peaches, Plums, Nectarines, Abricots, Apples, and Gooseberries, I have successfully removed when their Fruit has been full grown upon them, and we have Instances enough of Pears, that do very well, which have been transplanted about Midsummer; there is now one at *Mr. Fairchild's, Hoxton.*

I find by the Planting these Trees in Summer, that they make very good Roots before Winter, and are so well stored with Sap against the following Spring, that they shew no Sign of their Removal; but bear extreamly, and make very good Wood. And especially I think it necessary to take this Advantage, if we design to force them sooner than ordinary to Blossom; because, unless the Roots are well furnish'd, the Fruit cannot be sufficiently nourish'd. Besides, by this Summer Planting, the Trees seldom or never throw away their Strength in Autumn Shoots, or make any attempt
to-

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towards it, till the Frosts in *September* and *October* stop their Design.

If we should perceive their Desire to shoot at Autumn we should by no Means be tempted to encourage such Shoots, either by covering the Frames with the Glasses, or laying hot Dung to the Back of the Paling; for it would induce the Blossom Buds to open Imperfect, and so loose their Promise of Fruit the following Spring; but we must allow them Time for the Juices to digest, before we begin to force them.

I find by Experience that we hurt our Trees, if we apply our Heat before *November*. And I find likewise, that about the Middle of that Month, or towards the End, is Time enough to bring us ripe Cherries, both Duke Cherries, and those call'd *May* Cherries, in *February*. And at the same Time likewise, the Heat may be used for Abricots, so as to make the Masculine Abricot as large in *February* as Duke Cherries, and ripen them the Beginning of *April*.

Abricots, tho' forced in this uncommon Season, will thrive and prosper well for many Years; but Cherries do not seem to bear this Alteration in Nature so well as the Abricots, however I have known them hold Seven Years in good Plight.

Some

Some of the forward Sorts of Plums have been try'd, and ripen about the End of *April*, and I judge that the *Anne-Peach* would be ripe about that Time, or a Week later; and Mr. *Fairchild's* early Nectarine, which is a great Bearer, would, in my Opinion, ripen much about the same Time as the Masculine Abricot, if they were to be both forced together, and the Brugnion Nectarine would soon follow.

The Goosberries, which are of themselves apt to bud out early, would, undoubtedly, by this Means, be brought very forward, that is, to have Green Fruit fit for Tarts in *January* and *February*, and might probably ripen about the End of *March*, or Beginning of *April* at farthest; and altho' there is a Way of preserving Green Goosberries all the Year about, yet we find so great a Difference between the Preserv'd-Goosberries, and those fresh gather'd from the Trees, that the Price of the latter is Eight or Ten Times more than that of the former, when Green Goosberries first appear'd in the Markets; they were sold this Year, on the Third Day of *April*, for Eight Shillings *per* Quart; but if they had had the Assistance of a little Heat, they would have been much larger in *February*, and higher
C flavour'd

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flavour'd, and consequently would have been more esteem'd.

The Curran likewise, which tends to shoot forward, might, by that Heat which brings the Cherries in *February*, be forc'd to ripen its Fruit in *April* or sooner; for naturally the Heat or Temper of Air which ripens the *May Duke-Cherry*, brings the Curran so forward in its Fruit, that it is hardly Three Weeks later than the Cherry, in ripening its Fruit.

We might also Plant a Row or Two of Strawberries, close to the Back of this Frame, and they should be of the Scarlet Kind. We may expect from these, Strawberries ripe at the End of *February* or Beginning of *March*.

The Vines likewise which I have mention'd, may be brought to Blossom in *February* or *March*, and have ripe Fruit in *May*.

Among this Fruit we might here and there have a monthly Rose-Tree, and the Border might be planted with Early Tulips, Hyacinths, Junquils, and Narcissus Polyanthos, and then the monthly Production of this Frame would be in *December* Hyacinths, and some Tulips.

JANUARY.

Hyacinths, Tulips, and Green Gooseberries, Cherry Blossoms, Strawberry Blossoms, Abricot Blossoms, Peach Blossoms, Plum Blossoms, and the young Rose Buds beginning to appear.

FEBRUARY.

Some of the later Tulips, Junquils, Narcissus Polyanthos, Roses, Green Gooseberries, Green Abricots, ripe Cherries, Green Peaches, Green Plums, and towards the End, a few ripe Strawberries. Likewise we may then expect the Vines to put out their Blossoms, and the Currans to be pretty large.

MARCH.

Tulips, Roses, Junquils, Narcissus, Duke Cherries, Strawberries, Green Gooseberries, Green Abricots, Green Plums, and about the End perhaps, if the Weather be favourable, some Currans, beginning to turn, and some small Green Grapes.

APRIL.

Roses, Strawberries, the Masculine Abricot ripe, some Duke Cherries yet remaining, ripe Gooseberries, ripe Currans, and about the End, some Early

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Plums, and the Early Nectarines; and Peaches so forward as to ripen at the End of this Month; and also the Grapes so much forced as to ripen the next Month, and about the End to be in full Perfection.

But I come now to speak of the Method of Planting, Pruning and Ordering these Fruit Trees, that they may give us these Rarities in the Months I have promised them: And first, Of the Planting them.

We are to understand, that contrary to what we have said of Planting Trees against Walls, these Trees must be planted close to the Paling; for tho' I advise to plant Wall-Trees with their Roots at a little Distance from the Wall, for their better Nourishment; the Case here is very different; for the Roots will run under the Pales, and draw Nourishment equally from the Earth about them; but the Foundations of Walls lye too deep in the Ground to suffer the Roots of Fruit Trees to draw Nourishment from the Wall Side.

Again, In such a Frame we need not Plant our Trees at greater Distance than Four or Five Foot, or at proportionable Distances, according to the Shoots they have upon them; if they had been
trained

trained in Espalier, or against Walls, Two or Three Years beforehand, it would not be amiss, because of filling our Frame more speedily with bearing Wood. For my Part, I should not scruple removing Trees that had stood Seven or Eight Years against Walls, rather than want those that are Bearers for these forcing Frames; or if they were of a much greater Age, they may be safely transplanted by a New Method.

The Goosberries, Currans, and Roses, will serve to fill up the small Spaces at the Bottom of the Paling, while the Cherries, Abricots, Peaches, Nectarines and Plums, employ the higher Parts of the Pales.

When we come to Pruning these Trees, we may follow the same Method of Pruning the several Sorts as is recommended in my Month of *February*, in my preceeding Papers; but the Time of Pruning and Nailing must not be the same, for this Reason: In the Forcing Frames, our Spring begins in *November*; but in the common Case of Stone-Fruit against Walls, the Spring does not begin till the End of *January*, or in *February*, and there we leave our Trees unprun'd, till the Spring begins to stir, least the Frosts should damage them, and also that they might not be wounded till they

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they had Strength enough, and a favourable Temper of Air to grow freely, and help their wounded Parts. Now as the Case is with the Trees against the Paling where the Spring begins in *November*, and the Air will be so temper'd by Art to set the Trees a growing, and no Frosts can come at them, I have found it necessary to Prune such Fruit-Trees about a Week before I began to apply any Heat, and put up all the Glasses as soon as they were pruned.

In the Nailing the Trees to the Pale, every Branch and Shoot should lye as close as may be to the Pales, for there will be a Months Difference between the Ripening of the Fruit which touches the Pales, and that which lyes Two Inches from them, nor in these Frames does the Fruit which grows next the Root, always ripen first; I have seen the Tops of the Trees have Blossoms and Fruit, a Month or Six Weeks sooner than the Bottom; sometimes a Branch has been full of Blossoms, when Ten or a Dozen more, growing upon the same Tree, have not stirr'd till the Fruit of the first Blower has been almost ripe, and yet the Tree has done very well; so that 'tis not uncommon for such Trees to have Fruit ripening upon them near Three Months.

Now,

Now, as for the Gooseberries, we should pick out such Plants as will spread; and besides laying as many Shoots to the Paling as we can conveniently, we may leave others at a distance from the Pales, to follow the first in Fruit. I observ'd before, we may have them bear the first Year, as well as if they had not been transplanted, if they are taken up in the Summer, and managed after my new Method. The Currans may be order'd in the same Manner, as well as the Roses. But we must note, That the best Sort of Rose for this Purpose, is the Cluster monthly Rose, and these Roses should always be top'd about the End of *July* or Beginning of *August*, to make them sling out a great Quantity of Flower Buds, when we apply the Heat to the Pales.

We now come to consider the Manner of laying the hot Dung to the Back of the Pales, and what Proportion of Air these Plants require while we are forcing them.

The Dung which is design'd for this Use, ought to be toss'd up in an Heap some Days before it be lay'd to the Back of the Pales, that it may yield a Heat every where alike, and be constant. When it is fit to apply to the Pales, we
must

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must lay it Four Foot wide at the Base, and let it slope to Two Foot at the Top, the Height in all should be at first within Four Inches of the Top of the Pales, and in Six Weeks Time it will sink to about Three Foot, and then we must apply some fresh; the first Heat doing little more than Swelling the Buds of the Trees, and bring them to a Green Colour, or, at most, barely shewing the Colour of the Blossom Buds; but this happens to be sooner or later, as the Frost has had less or more Influence over the Buds. It helps very much to forward the Blossoming of these Trees, to cover them with the Glass Lights, when the Frosts happen; for tho' the Frosts will not destroy the Blossoms, yet the more the Frost comes at them, the dryer they will be, and the harder they will be to open. It must be observ'd likewise, that no Opportunity of Showers be deny'd them, if the Weather be tolerable mild, till the Buds begin to stir; but, after that, let the Glasses remain over them constantly, till the Sun begins to have some Power. In the meanwhile, let the Doors at each End be open'd when the Sun shines warm, and the Wind is not too sharp; and if this does not happen during the Space of Fourteen Days, then open the Doors at
both

both Ends, and put up Matts of Bafs or Canvas over the Door-ways, to correct the Winds, and cause the Air to circulate in the Frames.

About Three Changes of Dung will go near to bring our Cherries ripe in *February*, allowing each Parcel to remain a Month at the Back of the Pales; but if *April* proves cold, as it has done this Year, we must continue our forcing Heat till the Weather in *May* is settled, for our Plums, Peaches, Nectarines, Abricots, and Grapes; but while these last Fruits are growing, as they will be in *March* and *April*, open some of the Glasses in the Mornings when the Sun is warm and the Winds still, and give them such gentle Showers as happen to fall; but never let the Rain come at them when they are in Blossom, for it is plain from Experience, that when the Rain falls upon the Blossoms, before they are set for Fruit, they will rarely come to Good.

Now where Forcing Frames of this Kind are kept, the Dung, when it has lost its Heat, may be laid into Heaps, to rot, for the Benefit of stubborn Grounds. And we should observe that, when we plant these Frames, we should plant such Fruits as come forward, together; and the latter Fruits, by themselves: For when the forward Fruits have done bearing, it would be prejudicial to them to

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give them any more Heat, as they must have, if they are set promiscuously among the late Fruits, which perhaps may require artificial Heat till *May*.

To render this Sort of Frame still more pleasant and useful, we should have one, which besides the Fruits already mention'd, should have its Border chiefly disposed for bringing forward Pease, Beans, Cabbage-Lettice, young Sallads, Kidney-Beans, some Artichokes, Cauliflowers, and Nasturtium Flowers, and Early Minth.

I have seen some of the Second Dwarf Pease which were fit to gather about the Tenth of *January*, being closely planted to the Pales, and kept close to them with a Packthreed; and I have heard of some that were sow'n about the Middle of *September*, and were only glafs'd in the Nights, to keep them from Frosts till the Beginning of *November*; and then the hot Dung being apply'd, they had Fruit ready to gather about *Christmas*.

The Beans next to this Row of Pease were fit to gather about the Middle of *February*, and the Minth was very good from *November*, till there was enough in the Natural Borders. In an open Part of such a Border there has been good Cabbage-Lettice, about the Middle of *February*, they were of the brown *Dutch* Kind; and those Lettices which were
cabbaged

cabbaged in *October*, have kept very found till *January*, chiefly the Imperial Lettuce.

When the Pease are gone, which will be about the End of *January*, we may refresh the Earth, and set Kidney Beans of the *Batersea* Kind; which will begin to run by that time Beans are gather'd, that is, about the End of *February*, and about the first Week in *April*, will be fit to gather, and continue to bring fresh Fruit from Day to Day till the End of *May*.

The Nasturtiums being sown about *November*, or at the End of *October*, will Blossom about the End of *April*, or Beginning of *May*. And Artichokes, by this Assistance, will perhaps be fit to cut about the Beginning of *February*; but these, I think, take up too much Room to reward our Pains.

The Produce then of this Frame, will be in *November*, Cabbage-Lettuce, Minth, and young Sallads.

I n D E C E M B E R.

Minth, young Sallads, Cabbage-Lettuce of several Sorts, and Green Pease.

I n J A N U A R Y.

Minth, young Sallads, Cabbage-Lettuce, and Green Pease.

In FEBRUARY.

Mint, young Sallads, Cabbage-Lettuce, Beans, some Green Collyflowers and Artichokes.

In *March* we have these continued, and about the End of *April*, we have Kidney-Beans and Nasturtium Flowers. Besides the Fruits, as in the other Frames.

To bring Cherries in *December*, it has been practised to pull off all the Blossoms of a Tree as soon as they were Budding out in the Spring, and the Tree kept very dry from Rains, all the Summer; and about the End of *July*, or in *August*, give it gentle Waterings, by little and little; so that about the End of *September* it has been full in Flower; we must then keep the Glasses over it, and about the End of *October*, if the Weather be cold, or Beginning of *November*, apply the Dung to the Back of the Pales, and give fresh once a Month; so we may expect ripe Cherries in *December*.

If we have Two of these Frames, they should stand about Twenty Foot a-part, for the greater Freedom of the Air, and that the Sun may have the Opportunity of warming the Ground in the Front of the back Frame.

The Morello Cherry, which is apt to come late, will hang a long time upon
the

the Tree, even till the End of *October*, and I believe, if we were to shelter such Trees from the Frosts with Matts or Glasses, the Fruit might remain a Month longer upon the Tree, and perhaps till *December*, for it is not apt to rot as other Cherries do; this Cherry likewise is very apt to Blossom twice in a Year, the first about the End of *April*, and the second Blossom, about the End of *July*. Now 'tis likely that the Cherries which I have seen upon these Trees in *October*, were the Fruit of the second Blossom. A curious Member of the *Royal Society*, *William Tempest*, Esq; had a Cherry of this Sort, if I mistake not, ripen'd in *November* from the second Blossoms. I would advise therefore, the taking off all the Spring Blossoms from a Tree or Two of this Sort, to make it Blossom the better for a Crop of Winter Fruit; 'tis the most hardy of all the Cherries.

It is observable, that Currans will remain good upon the Trees till *October*, if the Bushes are well matted up as soon as the Fruit is colour'd; but it must be a very dry Season when the Matts are put on. I am of Opinion, That we have many Sorts of Fruits which will hang upon the Trees all the Year about, and be fair to the Eye all that Time, if they are kept from the Frosts. Mr. *Fairchild* has now one of the *Nonpareille* Apples,
upon

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upon a small Tree, in a Pot, which seems capable of holding good till the Blossoms of this Year have ripen'd their Fruit.

We should likewise provide some Beds of Strawberries, chiefly of the White and Scarlet Wood Kinds, to bear Fruit in *September* and *October*; and the Hautboy-Strawberry likewise, will bear Fruit at that Time of the Year; but all these must have their Blossoms pinch'd off in the Spring, as soon as they begin to appear, and the Plants kept dry, till about the Middle of *July*, and then gently refresh'd with Water. This Method will certainly make them bear as I say; but they should be shelter'd from the frosty Nights in *September*, with Matts upon Hoops, to make them hold bearing till towards the End of *October*. From Two Beds, each 35 Foot long, and Four Foot wide, I have had near a Quart of Strawberries a Day, from this Autumn Blossoming.

But I come now to mention what Helps we may expect from hot Beds, towards the Furniture of the Table in the Winter Months; and that, with good Management, may be very considerable: As Kidney-Beans, Asparagus, Cucumbers.

As for Kidney-Beans; I once sow'd some about the Middle of *July*, and they began to bear Fruit about the End of *September*; but not being shelter'd from the Frosts, which were pretty sharp about the
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the Middle of *October*, the Plants were lost. A second Tryal was made by a Friend, who set some of the Dwarf-Kidney-Beans at the End of *July*, in common hot Bed Frames; but did not put on any Glasses till the small Frost at the End of *August* began, and then only cover'd them a Nights. These began in *October*, about the 15th, to have Beans upon them, and, without any artificial Heat, he gather'd Beans till the Middle of *November*. The following Year, I had Baskets made a little open on the Sides, and about Ten Inches over, such as I have prescrib'd for Cucumber Plants in my new Improvements; in some of these I set Beans the End of *July*, and, in others, I planted some about the Middle of *August*, and placed them in Frames, for the Conveniency of covering them when the Frosts began. About the Middle of *October* I had a hot Bed made, to yeild a very gentle Heat, and set my Baskets of Plants upon it. The Beans planted in *July*, had Fruit much about the same Time; but those set in *August*, did not Blossom till the Beginning of *November*, and, about the End, had Fruit fit to gather; and all this while the others yeilded Plenty of Beans.

About the End of *November*, I had a fresh hot Bed made, and put into it only the Kidney-Beans raised in *August*, and gathered

gathered good Fruit from them till near *Christmas*, and I believe they would have continued good till *January*, if they had been taken care of; so that I think we need not doubt of this Rarity at an easy Rate, if it is cultivated with Judgment.

It might be well, to consider the several Sorts of hot Beds which I have treated of in my new Improvements, and in my monthly Papers for the preceeding Year, and particularly of the hot Bed made of Tanners Bark, in the Observations concerning the Ananas by Mr. *Telende*.

Asparagus, and the Manner of Forcing it in Winter, I have treated of in my former Works, so that we may have it from *November* till *April* that it comes naturally. This Year indeed the Season was so much forwarder than usual, that I saw Asparagus growing in the Natural Beds in the first Week of *March*, which was a Month earlier than ever I have seen it come up about *London* without Forcing.

We have had a late Demonstration that Cucumbers may be brought to bear Fruit in *January*, by such Management as Mr. *Thomas Fowler* gave them; and it is as evident to me, that they may be brought to bear Fruit in every Month in the Year, with Care and good Judgment; but it must be a Man of true Spirit and Ingenuity that

that undertakes it, and he must not want Necessaries; and indeed those Necessaries, considering the Value of such Productions, are but trifling; but were they made never so expensive, yet they will not do without a brisk Genius, to use them according to Art.

The Reason why I say that Cucumbers may be fit for the Table every Month in the Year, is from what I observ'd the last Year. The common natural Cucumbers last tolerable good till the End of *August*, without Spotting, tho' they run upon the Ground; and if we take Care to let some Cucumber-Vines run up Sticks against Walls, they will have very fair Fruit till the End of *October*, without Spots, but especially if they are cover'd in the Nights from Frosts; and in *November* and *December*, Mr. *Fowler*, Gardener to Sir *Nathaniel Gould*, among his Cucumber Plants, of various Ages and Degrees of Growth, had Fruit set, which he could have brought to Perfection, if he had thought proper; but this he only did by the by, for Experiment Sake: His Aim, as he told me when he first began, was to cut Cucumbers on *New-Years-Day*; which he very judiciously brought to pass. And in *February* and *March*, we have had Cucumbers cut in several Places besides, this Year; and, for the other Months, there is no Doubt of having them in Plenty.

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While I am speaking of hot Beds, I cannot avoid mentioning a very curious Contrivance of an ingenious Gentleman, *Samuel Molyneux*, Esq; which will, in my Opinion, be of great Use in Gardening, and take up very little Room: There must be a Frame made of Wood, in the Manner of a hot Bed Frame, suppose about a Yard long, and Two Foot over, with a Glass Light to cover it, and wiew'd at Bottom, so as to hold a sufficient Depth of Earth, for the Nourishment of the Plants it will contain.

We are then to provide a Box of the same Length and Breadth, of about Ten Inches deep, to be fill'd with Sand, for the Frame to stand upon, the Bottom of this Box to be a thin Iron Plate. Thirdly, We must cause a Box to be made of Iron Plate, proportionable to the Box of Sand, so deep that a Lamp may burn in it; and at one End of this Box there may be an Outlet for the Smoak, to be used as we see Occasion. Upon this Iron Box, which may be made to move upon Wheels or Rollers, we are to set the Box of Sand, and upon that the Frame of Earth; I suppose the Iron Plate at the Bottom of the Box of Sand, may serve for the Top of the Iron Box where the Lamp is to burn.

The Oyl which may be used for the Lamp, will cost about Six-Pence *per* Quart,

Quart, and a Quart of Oyl divided into Eight Parts, will last burning so many Times Twelve Hours.

If we consider that such a Body of Sand will hold an Heat for Eight or Ten Hours when it is once warm'd through, we need not keep the Lamp always burning, so that perhaps then a Quart of Oyl may serve a Fortnight; but there may be a Thermometer placed in the Earth, within the Frame, to shew us when the Lamp may burn, or when it may be put out, and a little Experience will inform us of the just Quantity of Oyl necessary to be expended. In my Opinion, Heat may be regulated to any Degree we desire, by this Invention; if it is too moderate we may take away some of the Sand, and if too violent, we may add more. Besides, we may move this hot Bed from Place to Place, that is, it may stand Abroad in fair Weather, and be shelter'd in a Green-house, when the Weather is very sharp and frosty.

But in the moving of it from Place to Place, I think it advisable to fix its Face always to the South, and not for the Sake of getting a little Sun to change it sometimes to the East and West, for it is the Nature of Plants always to stand still, and never to change their Face from the Point they were first directed to; and this has been so much regarded by the

old Planters, that they direct us, when we plant Trees, to set always that Side of the Tree which stood towards the South, as exactly as may be, to point the same Way ; and even among the smaller Plants, I think 'tis reasonable to do as much, for they are under the same Law of Nature.

There are Two or Three Things more I shall mention relating to this Garden, before I speak of the Walls which are to enclose it: The first is, the Method of bringing Beans to bear early with safety, and without the Use of hot Beds. When we set our Beans for a forward Crop, we should put a good Quantity of them into such Places as may be cover'd with such Frames as are used for hot Beds, when the Frosts begin; and by that Means, if all those that stand abroad should be destroy'd by Severity of Weather, we may plant out those which have been preserv'd under the Frames, in their Places, and they will prosper very well, and bear Plenty of Beans, if they have not been too much confined, or have not been drawn too much under the Glasses; for then they would be tender in the Shank, their Joints wide, and their Fruit weak, and few in Number. I have try'd this with good Success; and whether the Plants of Beans have been shelter'd or not, they may be transplanted very well
in

in the Spring, tho' they are Four or Five Inches high, and even in *May*, if we cut them down within Two Inches of the Ground, a Week before we transplant them.

The next Thing is, To sow Cucumbers the Beginning of *May*, in Drills, the Seeds may be set about Ten Inches asunder, and the Drills may be a Foot a-part. When the Cucumbers have made their second Leaf, set a Line of Brush-Wood Stakes about Five Foot high, between the Lines of Cucumbers, and they will run up these Stakes of their own Accord, and bring very good Fruit till the End of *September*, and even in *October*. We may note, that Cucumbers, thus raised, without transplanting, if they have the Liberty of running up Stakes, will not be subject to the Rot or Canker, as I have experienced.

Lastly, We should have in this curious Garden, Conveniencies for raising of the Ananas or Pineapple; which I have describ'd in my monthly Papers of the preceding Year.

Thus having gone through what I proposed in describing the Frames for forcing of Fruits, Flowers, &c. out of their wonted Seasons, I come in the next Place to inform my Reader of the Method of Building the Walls which should partly enclose this Garden, and may be so order'd,

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order'd, that we may forward the Fruits planted against them as we shall see convenient; and I shall be the more particular in my Description of these, because it is not every where in *England* that we can find hot Dung enough for hot Beds, and there are many Countries where Coals are in such Plenty, that the Expence of warming Walls of several Hundred Foot long will scarcely amount to Thirty Shillings *per Annum*, for the smallest Coal, such as is generally counted good for nothing, except mending the Highways, will do for this Use.

The Walls I speak of should be expos'd to the South Sun, for the Walls lying to the East, West, and North Aspects, as they are not sufficiently in the Sun's Way to bring Fruit forward, so they may be built after the common Manner.

The Walls then which lye to the South-Sun, should be built Eight Foot high, with Fireplaces at the Back, at Twelve or Fourteen Foot distance from one another. From each of these should run a Flue of Nine Inches square, parallel with the Border, about Four Foot and half from the Center of the Fireplace, and then rise in an upright, about a Foot and half, and be return'd towards the Peer over the Fireplace parallel to the first, and rise to an upright as before, to be return'd back again in course with
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the first. And these Turnings of the Flue must be continued till it comes near the Top of the Wall, and lets it smoke out at a Chimney over the Fireplace. We are to note, That these Sort of Flues may be carried both from the right and left of a Fireplace, and by that Means the Fires being about Twelve Foot distance from one another, the whole Wall may be regularly warm'd at once, if we think proper, or about Ten or Eleven Foot of Wall may be warm'd at a Time by one Fire only.

The Border on the South-Side may be rais'd so high as that the Earth might lye against the Bottom Flue, to be warm'd the better.

This Wall should be Two Bricks thick, for the better forming the Flues, as well as for its Strength; and for the better regulating the Flues, and for the greater Ease of the Builder, there should be made on purpose Tile-Bricks of Eighteen Inches and Quarter long, Nine Inches and a Quarter broad, and Two Inches and a Quarter thick; which will at once cover the Flues, and reach the whole Thickness of the Wall. Now considering the Space which will be vacant in the Flues, such a Wall will hardly take up more Bricks than a Wall of a Brick and Half thick.

When this is done, we must provide Frames and Glasses, in the Manner of those used against the Paling I have already treated of, only with this Difference, that if we have a mind to force a single Tree, only that Part where the Tree is, may be cover'd with Glasses, and shut up.

The Border may be Four or Five Foot wide; and if the Glasses were to be set upright, and a Covering of Sloping Glass from those to the Wall, one might then have Room to walk within-side. By the Help of this Contrivance, we may have every Thing mention'd in the forcing Frames, as above; and one might add Carnations too, to be kept blowing all the Winter, and the *Spanish* Jessamine, and if they were nail'd against the Walls, would open their Flowers very large.

But these Walls would likewise be extremely useful, to forward our late Kinds of Grapes and Pears, and with good Management, might in a manner place us in as warm a Climate as Thirty Degrees Latitude. And besides, here our Crops of Fruit would never fail us, if the Trees were in a Blossoming Condition, and were well prun'd, and the Advantage that might be gain'd by the extraordinary Number of Fruit, and its superior Excellence, would very soon return the Expence of the Glass Frames, and the Trouble of making Fires.

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The Pears which we should cultivate against such a Wall should be those which are brought to Table in the Winter, as the Colmar, Bon Chretien, &c. which want Sun at our Autumn, to give them their true Flavour ; so that if we force them to Blossom about Six Weeks or Two Months sooner than usual, we may be sure to have their Fruits as excellent as they are any where in *Europe*.

So the Grapes which might be help'd by these Walls, are all the Sorts of Frontiniacks, the Raisen Grape, and every other Sort of late Grape, even the Canary Grape, only by bringing them to Blossom in *March* ; there would then be Summer enough for their Growth and good Ripening ; but against this Wall also, we must not forget to have some of the forward Sorts of Grapes, to ripen about the End of *May*, as they they have done already in *England*, by such Means.

To conclude, I shall insert a Method of making a hot Bed by Means of Fire, for the Service of those Gardeners who have but little Opportunity of getting hot Horse-Dung. This I learn'd from Mr. *Benjamin Whitmill*, a curious Gardener at *Hoxton*. He prescribes, to make a Frame of Brickwork of any Length, but as wide only as a common hot Bed, to have a Fireplace at one End, to pass into a Flue which shall wind from Side to Side till it reaches

F reaches

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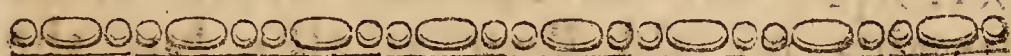
reaches the other End, and discharges its Smoke by a Chimney ; the Top of these Flues may be cover'd with Square Tiles, or such Tile-Bricks as I have mention'd before ; and when the intermediate Spaces between the Flues are fill'd with coarse Sand, cover the Whole with Square Tiles, and raise the Wall about Ten Inches above the Pavement, so that we may cover the Pavement as deep with Sand, if we see Occasion ; then upon this Sand place such Frames as are commonly used for hot Beds, with Wire at the Bottom, to hold the Earth in them, and that the Earth may receive the Heat of the Sand. And, I am of Opinion, it may be as useful as any hot Bed, and be more lasting and less troublesome.

We may see the Method of the Flues for the great Wall, in *FIG. II.*

Since I have written this, I have learn'd from the curious Mr. *Dubois* at *Mitcham*, somewhat more than I have yet related, concerning the Production of Pease in the Winter : That Gentleman informs me, that he gather'd Pease this Winter, from about Six Plants which were sow'n in a Pot late in the Autumn, and that had stood expos'd abroad for some Time, and shelter'd, during the rude Season, in the Conservatory ; they were of the Second Dwarf-Pea Kind, which bear plentifully, and were trained upon Sticks ; the Pease
gather'd

gather'd at one Time yeilded, when they were shell'd, about half a Pint, which turn'd to good Account considering the Room they fill'd. And I think it would be an agreeable Amusement for such as have Conservatories, to cultivate, either this Sort of Pea, or the smallest Dwarf, in Pots, so as to have them all the Winter long without extraordinary Trouble.

I forgot to mention, That this curious Garden should have one Part of it dispos'd for Mushroom-Beds, after the Manner they are propagated about *Paris*.



A L E T T E R

To — TROWEL, of the Middle-Temple, Esq; concerning the Growth of Tulips; with some Hints concerning the Circulation of Sap, &c. tending to discover a Method of Breaking Breeding Tulips, or making the Plain Flowers become Strip'd,

S I R,



Have lately had an Opportunity of Viewing and Considering several Collections of Breeding Tulips, and have gather'd a few Remarks concerning them, which hitherto has been but little observ'd, tho' I believe

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the Breaking or Striping of Tulips, very much depends upon them.

First, We are to observe that a Tulip does not preserve its Root Two Years together, but the Root that was taken out of the Ground last Year, is quite lost this Year, in the Leaves, Stem, Flower, and Seed; and while these Parts are growing, and by that Means diminishing the Root they spring from, the Juices which circulate through them, are framing a fresh Root, bordering upon the Place where the first was; so that when the Plant has perform'd all its Summer Work, there remains no old Root at all; but the Flower-Stem sticks to the Side of the new made Root.——You may be sure this Root is new, because the Stalk stands on the Outside of it, and every one knows that the Flower-Stalk always comes out of the Middle of the Root that was planted.

While Tulips are under several Degrees of Growth from the very first putting forth of the Leaf, the Root declines daily, and a new Root is forming itself and daily encreasing; and when the Flower and Seed is fully perfected, the old Root is entirely wasted, and the new one is fully compleated.

To discover this, I took up several Tulip Roots in different Degrees of Growth, and in Proportion to the Times they

they severally required to perfect their Seed; I observ'd the new Roots were greater or smaller, as there was less or more of the old Root left. Before the Flowers were colour'd, I found the old Roots were but half decay'd, and the Cloves in those Roots on the Outside began to dry.

When they were in full Bloom, the Cloves which were remaining were all inclining to dry, and there were Three, and sometimes but Two in Number, in the old Root; and then the young Roots were very strong.

While the Tulips were in this State, I took up several Roots of the large Red breeding Tulips with Black Bottoms, the Roots and Stalk of one of them, which I split through the Middle, I have delineated, for the better explaining of this Relation,

FIG. III. *A* is part of the old Root with its declining Cloves, from the Bottom of which springs the Flower Stalk *B*. This Flower Stalk is partly fix'd to a hard Substance, like the Kernel of an Hazle-Nut at *C*, and partly at the Bottom of the new-framing Root *D*, which is likewise of a Substance like the Kernel of a Nut; and from thence the Cloves of the Root take their Rise. *E* shews the Point of the new Root from whence the
Fibres

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Fibres will spring the next Year, as C does the same Part where grow the Fibres of this Year, and here is plainly a Correspondence between all the Parts, both of the new and old Roots; but 'tis the old Root which only receives the immediate Nourishment from the Earth by its Fibres.

When we split the Flower-Stem of a Tulip, we find a great Number of Vessels running through the Stem till they come at the Flower, and are then branched into the Petals or Flower-Leaves, and distribute Nourishment into the *Stamina*, the *Apices*, and *Pistillum* of the Flower; but where the Flower-Leaves are set on, the Stalk becomes larger, and is of much harder Substance than in other of its Parts.

Again, when we examine a whole Tulip Plant in Flower, and first cut the Stalk horizontally, within an Inch of the Root, we find the Sap-Vessels much closer set together than they are towards the Top of the Stem. These Vessels as they rise from the Root, branch themselves, into the Leaves which grow upon the several Parts of the Stalk.

I infer from these Observations: *First*, That all these Parts, *viz.* the Flower-Stem, the Leaves, the Flower, and the Seed, are all perfected from the very Root
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that we put into the Ground, and prove more or less luxuriant, only as the Soil is more or less favourable to the Tulip; the Nourishment the Tulip receives from such Soil, is taken in by the Fibres.

Secondly, That by the Wasting of the old Root, and the Growth of the new one, which both correspond immediately with the Flower-Stem, it is plain that the Sap circulates through the Whole, for the new Root has no Fibres to nourish it and make it grow from the Earth, and therefore can be nourish'd only from some Vessels in the Stem upon the Return of the Sap which goes up from the old Root, and this Return of Sap must be constant, as the Growth of this new Root is constant; for was this new Root to be nourish'd only at set Times, it would lose in the Intervals what it gain'd at the Times of its Nourishment; but Experience shews us the contrary.

Thirdly, This new Root grows till the Flower and Seed is perfected, and then the old Root is quite decay'd, the Flower-Stalk dries, and parts from the new Root without Difficulty, which it will not do while the Stalk is green, and the Juices flowing in it.

Fourthly, We are to observe, that it is from the new Root we are to expect the Change or Alteration in the Stripes of the Flower; and tho' the Root we put
into

into the Earth for Blowing this Year, should bring a plain Flower, yet, by the Want of Nourishment which may happen to it by being planted in Brick, Lime, or Stone Rubbish, the Parts which are framed in the new Root may be so modell'd as to bring its Flower into Stripes the next Year. Therefore when we plant plain Tulips in Rubbish, to make them break into Colours, we must not expect to see any Alteration the first Year, for it is the new Roots, that are form'd in the Rubbish Soil, that must blow, to shew the Effect of Planting in such a Soil. The old Roots had already in them their Properties fix'd before we put them into the Ground, which could admit of no Alteration but of Blowing taller or lower, as they had more or less Nourishment from the Soil they were planted to blow in.

But it may be perhaps, that some of the Tulip Roots which we planted last *September*, might bring strip'd Blossoms this Year; but then we have good Reason to suppose, that those Stripes were regulated in the Roots that were made the Year before.

It is observable, that some Tulips already broke or come to stripe, will one Year abound in the dark Colours, and the next Year will come finely mark'd, as that Tulip which is call'd the *Vulcan* will

will do. I conceive therefore, that while a Tulip blows with a very large Share of the dark Colours, the new Root has imbibed a large Share of those Juices which will afford the brighter Colours, and so on the contrary; for in those Tulips which are call'd Breeders, I observe that the Mass of Colour in their Flowers, before they break, is a Compound of several Colours which simply appear in their Stripes when they come to break; and, that these Breeders cannot break into any Stripe of Colour but what is of one or more of the Colours which make the Compound Mass in their plain Flowers. As for Example:

The *Bagget Primo*, which is counted one of the best breeding Tulips, brings its plain Blossoms of a pale Purple, wherein is a large Share of White, a moderate Share of a deep Lake Colour, and a small Share of Blue. These Three Colours rightly blended together, will make exactly the Colour of the Flower of this *Bagget*. And when this Flower comes to break and stripe, which happens from these Colours being separated, then the Stripes are always of those Colours which were used to make the Compound Colour in the plain Flower of that Sort.

When the Lake is quite alone, it shews its Gaiety; when mix'd with a great

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Share of Blue, 'tis much darker; when with a great Share of White, of a Flesh Colour; and the Blue and White brings a Sky Colour; and so the Stripes will produce as much Variety as can be made, from mixing these Colours in different Proportions with one another. The Reason why these Colours come to be separated, seems to be from the Structure of the Vessels which are form'd in the new Root, some being made in such a Manner as to receive only such Juices as will yield one Colour, and another such as will yield another Colour, just like the Vessels in Animal Bodies; some yielding Red, as in the Veins; some White Liquor, such as Milk in the Breasts; and others, such as are of the Colour of Urine. Now I say, it is as plain, that there are Vessels in Plants for the Circulating and Secreting of Juices, as that there are Vessels in Animals which distribute and separate Juices in every Part of their Bodies.

It also seems necessary that this Circulation of Juices should be continued in the Tulip till it has perform'd all its Offices, such as perfecting its Flower-Stalk, its Leaves, its Flower, &c. for the better adapting the new forming Root to the same Mode of Growth, and imprinting in it every Natural Perfection of the Original it took its Rise from; therefore
I sup-

I suppose it is, that the new Root continues Growing all the Time that the old one is performing its Offices, that the Principles of every Part may circulate through it.

But the next Breeding Tulip which I shall take notice of, is that which is call'd the *Beau Regard*, which is of a much paler Purple than the *Bagget Primo*, its Mass of Colour is compos'd of a very small Share of Blue, a great deal of White, and about as much of the deep Lake Colour as of Blue. This Flower, when it comes to stripe, shews the Colours separately, that the plain Flowers are compos'd of, as the *Bagget Primo* has done before.

The Breeder which is call'd *Van Porter*, has its plain Flowers of a reddish Purple, where the Lake prevails more than the Blue, and there is less White than Blue; the various Colours which may be produced from these Three Colours, may be expected in those of this Sort which become strip'd.

The great *Dutch Red Breeder*, with the Black Bottom, has its plain Flowers of a dirty Red Colour, tho' compos'd of Two Colours, which are separately as beautiful as can be imagin'd, a fine Yellow, like that of Gamboge, and a Carmine Colour, make this unpleasant Mass of Colour; but when this Flower stripes, and the

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Colours are somewhat separated, the Variations are extremely fine.

The *Dutch* Red Breeder with a Yellow Bottom, is of a darker Colour than the former; the Colours which compose the Mass, are such as make the former; but in this there is a little Black intermix'd, and when it breaks, its Stripes partake only of the Colours in the Mass, either simple or compound, like the others before-mention'd.

We observe sometimes that the White is very prevailing in a Flower when it breaks; and spotted only here and there with other Colours, which were blended in the Mass of the plain Breeder; one may then not unreasonably suppose that the new forming Root possesses those Juices which make the darker Colours, and will shew them in its Flower the following Year.

Having now gone through my Observations concerning the Growth of Tulips, I shall recommend to your Tryal a Thought or two, how to make the Colours separate in plain Tulips, and bring those Stripes which make them so much admired: And that the Colours of the Flowers circulate with the Juices all over the Plant, seems certain to me, because of those Green Leaves which are now and then, upon certain Occasions, ting'd with Scarlet, Yellow, and other Colours,

Colours, only common to the Flowers on whose Stalks they are found. And that these Colours, or their Rudiments, likewise circulate through the new Root in some Proportion is evident, because that Root produces Flowers partaking of the same Colours of the Flower produced by the old Root.

As the Vessels which correspond between the old Root and the Flower, and from the Flower to the new Root, are all of them in the Flower-Stem, I am of Opinion, if we could pinch some of them without wounding them all, or arrest the Sap, so that it should not circulate with its wonted Freedom, then, I suppose, that the new forming Root, would, by such Checks, be brought to separate its Colours in such Manner as to produce Stripes of those simple Colours that composed the Compound Colour in the Mass. One Way of doing this may be, by binding the Flower Stem pretty hard with Packthread, a little before the Flower opens, for this Binding will, in my Opinion, either press or wound some of the Sap Vessels so much, that the Course of Sap will be prevented in them, and the new forming Root, by that Want, will become varied from the old Root; or if by a fine Lancet one could cut a few of them, it might perhaps have a good Effect; but whether they would
not

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not heal or close again, I am in some Doubt. The Vessels I would advise to be cut, lye just within the thin Skin of the Flower Stem; but I think the Pinching of them with Packthread is the surer Way.

There has been many Trials made, to alter the Colours and Properties of Tulips, as the Steeping the Roots in Liquors of several Colours, and the putting into the Cloves of the Roots, the Powders of several Colours, and the Planting them in colour'd Earth: But these Trials have all prov'd vain, as well as that of Drawing colour'd Silks of several Sorts, through the Roots, to stripe their Flowers. The Experiment which I propose, cannot hurt any of your Roots.

We may also observe, that now and then we shall find a Root form'd upon the Flower-Stem, an Inch or Two above Ground, which seems to discover that in that Flower Stem are Principles of all the Parts that belong to a Tulip Plant, and those could not all be in that Part, unless the Sap circulatated throughout the whole Plant.

I shall conclude this Letter with an Observation made by *Charles Dubois*, Esq; who, in his Gardens at *Mitcham*, shew'd me a ready Proof of the Saps Circulation in the great Garden Spurge, which immediately upon cutting off a little Shoot, the

the wounded Vessels in the Stalk, emit so large a Quantity of milky Juice, that it continues dropping for near Two Minutes, till the Air and Sun thickens it so much, that it stops the Mouths of the wounded Vessels. And that this Sap flows through Vessels which have their Rise in the Root, and have a Correspondence with others which return, it is evident in the Leaves of the Plant without the Help of a Microscope; but especially if we cut one of the Leaves a-crofs with Sciffers, the Milk will immediately shew itself at the Mouths of those Vessels which are wounded.

The *Apocinum* or *Dog's-Bane-Tribe*, which have milky Juices, will also shew us the same Thing, especially those that have the largest Leaves, and are the quickest Growers; and, I am apt to think, that some of them have Leaves transparent enough for us to discern the Milk circulating through them, as we do the Blood in the webb'd Part of a Frogs Foot, or Fishes Tail; but the Leaf we examine must be growing upon the Plant while we make the Observation, and the Microscope fix'd in some Frame to be kept steddy; we may also use a Lamp, to help the Discovery.

The Vessels which serve to convey this Juice through the Leaves of Plants, may be easily observ'd on the Back of the Fig-
Tree

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Tree Leaf, where we shall find that they are all branched into one another; and what Sap flows through one, corresponds with all the rest; so that the Juice which comes into the Vessels in the Leaf, through some of the Pipes or Vessels in the Foot-Stalk, circulates through all the Vessels in the Leaf, as well downwards as upwards, as the following Experiment will demonstrate. If we cut or stamp a small Hole, between any Two of the capital Vessels in the Leaf, we shall find the White Sap flow from the wounded Vessels on one Side, or about half the Circumference of the Hole we have cut; but rarely will it issue from the other Vessels that are wounded, because the Communication is broken; but if we make several of these small Holes in a Leaf, without cutting the larger Vessels, we shall find the Vessels in some, flinging out Juice towards the Root of the Leaf, and some flowing with Juices from the Foot-Stalk towards the upper-part of the Leaf, so that the Sap is running through all the Branches of the Vessels, whether up or down, at the same Time; and the Plant is increas'd in Bulk, by taking in to all its Parts such Shares of the Circulating Juices as each is appointed to receive. I am, S I R,

Your most Humble Servant,

RICHARD BRADLEY.

An



An Account of *Ranuncula's* rais'd from
Seeds by Mr. WILLIAM POTTER,
Gardener, at Mitcham in Surry. In a
LETTER to J. S. Esq;

S I R,



When I last had the Happiness of
your Company, you desired I
would, as Occasion offer'd, send
you an Account of such Curio-
sities as occur'd to me in the Way of
Gardening, and I have now the good
Fortune of acquainting you with one of
the most surprising Productions of Na-
ture that I have ever met with, either at
Home or Abroad, and I doubt not but it
will be the more acceptable to you, as
you are a Lover of Flowers.

I was lately at *Mitcham* in *Surry*, to
view a Collection of Seedling *Ranuncula's*
rais'd there by Mr. *William Potter*, a Gar-
dener, having first heard of their Excel-
lence from several of our best Judges,
who had seen them in the Strength of
their Bloom. I confess, among all that
I have ever seen of the *Ranunculus* Kind,

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I have

I have yet never met with any that were so agreeable to me, either in Beauty of Colours, Variety of Make, or Largeness of Blossom; and tho' there are many Hundred distinct Sorts of them, I am yet puzzled to say which of them pleased me best: There are many of them which have all the Properties that we could expect in a good Flower; and the others are so widely different from whatever has been seen in *England*, that they shine in such Properties as my Knowledge of Flowers could never give me Hopes of expecting; in a Word, they are *Nonpareils*, and deserving of a much better Character than I am capable of giving them.

Their Colours are of all Sorts, in several Degrees, from the clearest White to the darkest Purple, but the Azure-Blue is only wanting, to carry them through all the Colours, to the deepest Black. Some of these Flowers are of one Colour alone, others with their Petals or Flower-Leaves strip'd with various Colours which mark quite through, as the Carnations do, which are call'd *Flakes*. Some are powder'd or pounc'd with the gaiest Colours, like the Carnations call'd *Picketees*. Others again, are ting'd on the Edges with Varieties of Colours; and some have their Centers stain'd with Colours directly opposite to those of their other Leaves.

As

As for the Make or Figure of these Flowers, there are some shap'd like the *Ranunculus*, call'd the *Turks Turbant*, and such Sorts as we have usually cultivated in our Gardens, extreamly double, and blow very tall; others take the Form of *Roses* of several Kinds, and have their Flower Leaves of that Shape, and dispos'd in that Manner. Some again, are shaped like the *African Marygold*, and others like the *French Marygold*, even resembling these in their Colours. Some flower like *Double Anemonies*, and others like the finest *Double Poppies*, bringing Blossoms as large as *Peonies*. Some are of a *Star-like Figure*, and others turning their Leaves back, so as to form the Figure of a *Globe*. And there are many of such odd Figures, that I know not what to compare them with.

The greatest Part of these Flowers blow near Two Foot high, and branch liberally from the Root; so that it is not rare for one Root to bring near Forty Flower-Buds to Blossom with good Strength: The Manner of their Growth, and bringing their Blossoms, is much like that of the great *Yellow Ranuncula's* of the Meadows, which hold in Flower near Three Months, and are very hardy.

Many of these are *Semi-Doubles*, which bear Seeds that ripen well, and

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come out of the Ground with little Trouble; and some of these are extraordinary, for having their Seed bearing Vessels of a bright Yellow Colour. But 'tis an endless Work, to mention every remarkable Difference in them; you should see them, to admire them enough.

Tho' the Original of these Flowers came from *Persia*, I find the Offspring are very hardy, and resist the Frosts, even better than our old Sorts of *Ranuncula's*, and will flourish any where, if the Ground be rightly prepared for them.

The Natural Soil in Mr. *Potter's* Garden is pretty light, with a gravelly Bottom; but his Flower-Beds are made with the following Mixture, which he gives me Leave to mention, that every one may have the same Success that he has had, in Blowing this Sort of Flower: It consists of rotted Leaves, rotted Wood, Cow-Dung, Horse-Dung, and some of the Surface of the Natural Earth; which he gathers altogether, by the Side of a Wood, into an Heap, and sifts very fine for his Beds, after it has lain together for some Time. And when these are prepared, he plants his Roots, about *Michaelmas*, so as to bury the Bud of the Root about Two Inches and half deep. When they begin to come out of the Ground, we may shelter them in frosty Weather with Mats; and, as they begin
to

to rise, cover the Bed with a fresh Coat of the aforesaid Earth, about half an Inch thick, which will greatly strengthen the Roots, and especially help the new forming Roots or Off-sets: But this must be done carefully, without injuring the Leaves or their Stalks; for every bruis'd or broken Stalk injures the Root, till the Plants come to flower, and even then too, if the Blossoms are frequently crop'd. There is one Reason in particular, for the Coating the Beds with a little fresh Earth, which is, that the Ranunculus Root which is put into the Ground, always produces its Off-sets near an Inch above it, and as they grow, the Mother-Root decays; and even these new Roots help the good Blossoming of the Plant, because they join with the Flower Stalk, and help to nourish it, as well as receive Nourishment from it; and therefore this fresh Earth helps both them and the Flowers.

Now, when I consider that your Soil is very strong and binding, I shall take the Freedom to offer you a little Advice from my own Practice, in a Soil which was so stiff that it was judg'd fit for nothing but making of Bricks, and even upon such a Soil I had extraordinary Success, in the Culture of Ranuncula's, tho' it is suppos'd by many, that a Clay Country will not blow a Ranunculus,

or

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or even suffer it to live, altho' the Beds are prepared with proper Soil. I confess, was the common Method of preparing Beds in such a Soil to be follow'd, we must expect the Roots to be destroy'd, or to produce very weak Flowers; for the usual Way of making these Beds, is to dig deep Trenches in this Clay Ground, and fill those Trenches with good light sifted Mould, which Practice I find to be wrong, for if we once dig Trenches in Clay Ground, they serve only to receive and hold all the Water that falls; so that the fine Earth which is put into them, becomes a perfect Bog, which corrupts and chills the Roots, altho' they are planted somewhat above where the Surface of the Clay reaches; yet this muddy and standing Water, at the Bottom, has surely an unwholsome Vapour which rises from it, and the Earth, in the upper part of the Bed, is kept so continually moist by the Wet below, that a Ranunculus cannot, by any Means, endure it; and I have experienc'd, that the best Drains that can be made from these Sort of Beds cut in Clay, will not sufficiently drain them of the Wet they receive, even tho' the Ground lies upon a hanging Level. I therefore find it advisable, in such Ground, only to take off the superficial Soil which covers it, three or four Inches deep, without entering the
Clay,

Clay, and then lay a little Coat of Sea-Coal Ashes, or for want of them, some Lime Rubbish, and upon any of these, to raise my Bed about Nine Inches or a Foot thick, with good prepared Earth, such as I have mention'd above, or as I used to do about one third Part sandy Loam, as much old Melon Earth, and the rest rotted Wood and Leaves, but these must be well mix'd together, and sifted before we use it. But I have had very good Success likewise in making my Beds for Ranuncula's of Mould that I have taken out of great Woods, I mean the Parings of the Surface, which has been chiefly rotted Leaves and Wood, that has lain there, I suppose, many Years. The Reason I chose that Soil, was, because I observ'd the common Ranunculus call'd *Pilewort*, grew and prosper'd in it wonderfully. And a Gardener at *Acton*, who made his Ranunculus-Beds of old Tanners Bark, had his Ranuncula's prosper so well in it, that he had seldom less than Eight or Ten Roots Encrease, for every one he put into the Ground.

I must observe likewise, that the Paths, or Alleys between these Beds, should be fill'd up with Sea-Coal Ashes, or Lime, or Brick-Rubbish, or Sea-Sand, to draw the super-abundant Moisture from the Beds, and keep the Ground about them as dry as may be; or else, if these are
difficult

difficult to be had, we may lay the Alleys with Grass-Turf, which will likewise help to keep the Beds dry in the Winter, which the Ranuncula's require. The raising the Beds thus, upon the Top of the Clay, will suffer the Wet that falls, to pass away without incommoding the Plants, and you may then expect a good Shew of Flowers. I have known this Kind of Flower blow extreamly well under a South Wall.

As any extraordinary Things in this Way shall occur to me, I shall send you an Account of them: But I have detain'd you longer than ordinary upon this Occasion, because I imagine you will have Part of this Collection in your Garden, the next Season. I am,

S I R,

Your most Humble Servant,

RICHARD BRADLEY.



T H E

Monthly Register

O F

E X P E R I M E N T S

A N D

O B S E R V A T I O N S

I N

Husbandry and Gardening.

For the Month of MAY, 1722.

Observations concerning the Improvement of Beans and Pease. In a Letter to Mr. R. TROTTER of Newbold Vardon in Leicestershire, May 3. 1722.

S I R,



Our great Curiosity in *Husbandry* gives me an Opportunity of communicating to you some Thoughts and Experiments which will be of great
I — Advantage

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Advantage to those who cultivate Beans and Pease, either for Seed or otherwise.

First, It is a common Custom amongst the Farmers, when they are once provided with any Sort of Seed, to sow the same Sort continually upon their Farms, and thereby render it, in Course of Time, quite unprofitable; for where any Sort of Seed, tho' never so good at first, when 'tis brought into a Country, has been cultivated for Three or Four Years successively in the same Air and Scituation, tho' the Spot of Land be varied from Acre to Acre, or those Grounds enrich'd from Time to Time with Manures; yet, Experience shews us, that such Seed will degenerate and lose its first Excellence; so that, as I have observ'd in some of my monthly Writings, I still advise, that when we once become Masters of a good Sort of Seed, we should at least put it into Two or Three Hands, where the Soils and Scituations are as different as possible; and every Year the Parties should change with one another; by which Means I find the Goodness of the Seed will be maintain'd for several Years. For Want of this Use, many Farmers have fail'd in their Crops, and been great Losers. When I have had the best Sorts of Lettuce, Onions, Pease, Beans, and other

ther Seeds, I have found that, in a Year or two, they have degenerated in my Garden; but the Seeds of them which I gave away to my Friends, preserv'd their first Goodness; and I have receiv'd some Seeds of their sowing, which have brought me as good Crops as I had at first.

2^{dly}, It has been a great Neglect, that our Farmers have not been curious enough to enquire into the several Sorts of Beans and Pease, which Kinds of them produce the greatest Crops. I have known some Kinds of Pease that have produced about Forty Cods each Plant, and each Cod Two, or at most, Three Pease apiece. So that, to make an easy Computation of the Increase of one Plant, it might produce in a Year (or Summer) about a Hundred Pease for Seed. On the other hand, We have some Sorts of Pea that will produce about Thirty Cods upon a Plant, and one with another, will yield Seven or Eight Pease in each Cod, and then a single Plant will yield in one Year after the Rate of Seven in each Shell, Two Hundred and Ten Pease, which is above double the Number of those mention'd above, and the Pease are also larger than those that bring so few. So that in the Measure, there will be near two Thirds Difference, between the first and the last Kinds. In Beans likewise it is

observable, that some are apt to grow tall and long-jointed, while others are low and short-jointed, and bear full Crops of Fruit, even to yield half as much more in Measure as those do which are long-jointed. Mr. *Smith*, a good Gardener at *Putney*, is, I think, the only one who has taken notice of this, and has gain'd Profit by it. Among some Soil which was brought into his Garden, there was a Bean accidentally grew up, which brought a greater Quantity of Beans than ever he had seen before upon one Plant; he saved the Seed of this, and by changing it from Place to Place, became Master of the most profitable Sort of Bean in that Country, and now uses no other Sort in his Garden. 'Tis now a Time of Year when Things of this Nature should be enquired into: I have already mark'd several near *London*, and I wish you would do the like in the Country; for in these Plants we ought as much to observe, which are the best Bearers, as when we chuse our Fruit-Trees, for the Profit will be in Proportion. Neither do I find that these profitable Sorts of Beans and Pease are less agreeable to the Taste than the others; the larger Kinds are generally as sweet as the smaller Sorts: And 'tis a Maxim founded upon Experiment, that the larger a Bean or Pea is, so much more Room

Room and Air it requires to perfect its Growth, and ripen its Fruit.

3dly, It is a Custom among the Farmers (without great Reason) to sow some Crops of Beans and Pease before *Christmas*, and others early in the Spring, as in *February*, for Example; the Consequence is, That these Two Crops bring their Fruit at one Time, and therefore, about *London*, the Markets are glutted with them, and their Price is small. Besides, those that are put in before *Christmas* are endanger'd by the Frosts, and are often lost, which is a Hazard that we need not venture, unless we have Shelter for them, and the Help of a Wall; and how far that will mend the Case, see first Chapter of the *Remarks*, which will be publish'd for *April 1722*.

But let us suppose that we have Three or Four Crops, which were planted at as many different Seasons, that all are tending to bear Fruit together, as I have observ'd oftentimes; we may prevent this Inconvenience two Ways: Either by Transplanting some of them, when they are about Four Inches high, or cut them down when they are about that height; and then we shall find a considerable Difference in the Ripening of their Crops. But if we let them grow till they are knotted for Blossom, before we cut them down, then the young Shoots which
spring

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spring from the Bottom, will, in a little more than a Week, if the Weather be hot, shoot out full of Flower-Buds, and come not above a Week later than they would have done, if they had not been cut down. For the Juices in the Plant were then all so well digested and prepared for Blossom, that where-ever they could spring or appear, they must immediately tend to Flower; whereas, when the Juices in the main Stem were raw and undigested, and the Design of Blossoming was not perfect in it, then the Juices in the other Part of the same Plant must be of the same Kind; and a Plant cut down in that State, will fling out Off-sets, which, besides a Time for their Growth, must have due Time to digest and put themselves into a Bearing Posture; which, from Observation, I find to be a Month or Five Weeks, if the Weather be moderate; or somewhat less, if it is very warm.

To conclude, I must re-mind you of your kind Promise the last Time I saw you, of sending me your Observations concerning the Growth of Carps, and the Use you make of Broom-Seed. I remember also, you mention'd at that Time an Improvement you had met with by double Plowing your Ground; which I desire you will communicate, for the
Good

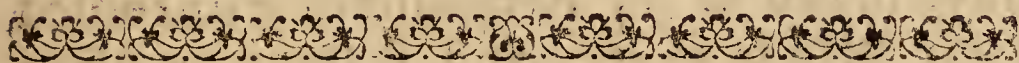
Good of the Publick. In the mean
while I am,

S I R,

Your Most humble Servant,

R. B.

P. S. There is a Sort of Pea in *Holland* which has no Skin within the Shell, so that the People eat them Shells and all, as we do Kidney-Beans; 'tis very sweet and very profitable, and I hope to introduce it the next Year.



An Account of a New Method of Transplanting Trees of any Bigness with Safety, either while they are in Blossom, or with Fruit upon them; so that Gentlemen who come late to their Estates may, in a few Days, furnish the Walls of their Gardens with Trees full of Fruit, or plant Wildernesses or Avenues that shall afford them an immediate Shade, and grow with as much Vigour as if they had not been transplanted.



It has been a general Complaint, that Plantations of all Sorts are so tedious in their Growth, that under Five or Six Years, one can hardly expect our Garden Walls, or
other

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other Garden Plantations, to yield us a Quantity of Fruit sufficient to answer our Expectations, or reward our Labours: Or would we desire Shade, we must wait still much longer for it; and there has been no Redress for either of these Grievances. I have known many noble Personages, as well as others, that have lamented the Want of the Secret to supplant Time, and call it back, or have wish'd themselves Twenty Years younger, to begin Plantations to their Mind, or that they might live to reap the Fruits of their own Labours. After this Manner have many of my Acquaintance unfolded their Minds to me, and I have as often taken Part with them in their Uneasiness upon this Occasion; for I was well assured that, upon the Foot of common Practice in Planting and Gardening, there could be no Redress for them.

The first Thoughts that I had to help them out of this Difficulty, related only to Fruit Trees; for which End I contrived the Raising of Fruits of all Kinds, in Cases or Boxes, that might take to pieces at Pleasure; so that these Trees might be remov'd with all the Earth about them, from one Place to another, with Safety: And also that such Trees, while they were growing in the Nursery in their Cases, should be trained in Espalier, so that, at their Removal, they should fit

fit a Wall at once without Difficulty. This I have fully explain'd in some of my former Works, and is now in Practise; but then this does not extend further than the propagating of Wall Trees.

The next Knowledge that I gain'd towards the Point in hand, was from Mr. Secretary *Johnstoun* at *Twittenham*, where I saw the Advantage of Transplanting Trees of all Sorts, in Summer: It was a Discovery of that Gentleman's, and practis'd, by his Directions, with wonderful Success, infomuch that some Lime-Hedges about Ten Foot high were remov'd in *May, June, and July*, and they gave very little Token of Removal; large Pear-Trees and Apple-Trees were remov'd, and grew in great Prosperity; and especially some *Scotch Firr-Trees* were transplanted out of a Nursery, the same warm Summer, and had shot above a Foot, before the others remaining in the Nursery began to stir or move in their Shoot. There was one Thing remarkable in these Transplantings, That the Firr-Trees had their Heads remaining upon them, which certainly contributed to their better Growth; and it is the common Opinion, That Trees of this Kind cannot be transplanted when they are of any tollerable Bigness, tho' these were near Thirty Foot high.

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The Elm-Hedges were forced to be cut or pruned when they were transplanted, to put them into Form; and the Orchard-Trees were lopp'd, for the better Convenience of Carriage; however they brought good Fruit the next Year, and, I suppose, would have much more, if all their Branches, or the most part of them, had remain'd upon them.

The Method of Transplanting these Trees, as I have heard, was by preparing Holes for them before they began to be taken up, and the Earth taken out of those Holes, was made very fine, and mix'd with Water in large Tubs, to the Consistence of thin *Batter*, with which each Hole was fill'd, for the Tree to be planted in, before the earthy Parts had Time to settle or fall to the Bottom. A Tree thus planted in *Pap*, has its Roots immediately enclosed, and guarded from the Air, and as the Season then disposes every Part of the Tree for Growth and Shooting, we find that it loses very little of its Vigour, if we have been careful of its Roots, to wound few of them at the taking it out of the Ground, or have not let them grow dry in the Passage from one Place to another.

The great Success which attended this Manner of Planting, soon gain'd Credit enough to invite many to follow the Example; but as it had been an old Custom

to Plant in Winter rather than in Summer, it was thought necessary by some People to join that old Custom to the new Invention of the Pap, and so all was frustrated, it would have been necessary to have thought the Tree was not in the same growing State in Winter that it is in Summer, and that when neither the Draught of the Tree, nor the Temper of the Air, can draw away the extraordinary wet from the Root which is contain'd in the Pap, then that Pap about the Root serves only to chil and rot it; when on the other hand, in the Summer, all Trees are fill'd with fluent Sap, and their chief Refreshment is Water, which neither their own powerful Spirit of Growth, nor the Warmth of the Air, will suffer to remain too long about them. 'Tis a Season when all Plants of the smaller Kinds, which are carefully remov'd, will strike Root in a Day or Two, and I see no Reason why large Trees will not do the same in a few Days at that time of the Year; but in the Winter Months, the Roots will not renew themselves. Therefore it is not necessary to transplant Trees in that dead Season, if it can be avoided, especially in Places abounding with Water; or to fill their Holes, at that Time, with *Pap*, which, for want of Warmth and vigorous Life in the Trees, must stagnate, and corrupt, and injure the Root.

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These Considerations, upon what I had observ'd at Mr. *Johnstoun's*, led me further to think of some Observations I had made in my own Garden, relating to the Circulation of the Sap, and how much that should be consider'd in Pruning, Planting, and the Ordering of Trees. In some large old Pear-Trees which I inarch'd into young Stocks, and had left entirely depending upon the Stocks when they had taken, having saw'd one of the old Trees from its Original Root. I say, the good Growth of every Part of the old Tree, which had no other Nourishment than from the young Stocks it was inarch'd into, plainly shew'd me, that there was as regular a Circulation of Juices as there is in Animal Bodies; and then, where such a Circulation is, it is as sure that it must be through Vessels which have an immediate Correspondence with one another, and then it is as necessary to preserve these Vessels entire, as it is to preserve the Vessels in an Animal Body entire, to help that Circulation. From whence I concluded, that at the Time of Transplanting a Tree, it was by no Means proper to cut off any of the Branches, or wound any of the Vessels, if possible, that the Sap might circulate more freely, and the Tree might remain in better Spirit, till it has renew'd its Roots, which

of

of Necessity must be wounded at Transplanting.

Now, as the Cutting and Wounding of some Roots of a Tree, and even among them some of the Capital ones, cannot be avoided, I thought it convenient to contrive a Mixture of Gums, to plaister over the wounded Parts of the great Roots, and prevent the Air and Wet penetrating too much into the Vessels of the Roots; and at the same Time, if the Root was very large, to mark its Corresponding Limb or Branch in the Head, to be cut off about a Fortnight afterwards, in the same Proportion, and to be then plaister'd in the same Manner as the Root was done before.

I find this Plaistering of the wounded Parts of a Tree to be of great Use for bringing large and vigorous Shoots, and preserving the Tree from Canker or the Rot, which will attack it by little and little, if the Mixture of Gums is not apply'd as soon as any Limb or Branch is cut off.

Nor must we have less Care to be sudden in the Removal of our Tree from one Place to another; for if the Roots grow the least dry, we may presently discern a Failure in the Top Branches which correspond with them; and that will require Time to redress, the more they fail, the longer Time they require
for

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for their Recovery. And for this Reason it has been thought impossible to remove a large Tree to any considerable Distance, tho' now I am satisfied of the contrary, having by Accident met with a Preparation, with which, if we anoint the Roots of a very large Tree, we may let it lye out of the Ground one Day, in the hottest Summer, and it will not drop or flag a Leaf; common Soap will do for Two or Three Sorts of Trees; but I find it is not agreeable to all, being subject to canker the Roots of many.

In this Way of Planting there is one Convenience, which is not in the common Way, and that is, that here we are not to take any Earth about the Roots, which will make their Transportation more easy. The small ones, such as Currans, Gooseberries, and such like, together with all the flow'ring Shrubs, when their principal Roots, which happen to be cut, are dress'd with the Mixture of Gums, which must be done while the Tree is taking up; these must have their Rcots immediately plung'd into a Vessel of Water, in order to convey them fresh to the Place where they are to be planted, and then filling the Hole with Water and fine Earth well stirr'd together, plant your Trees in that Pap, and continue adding more Earth and Water,
'till

'till the Holes are fill'd. We must then fix our Plants very well with Stakes, especially if they are tall or large Trees, and as the Pap begins to harden, it must be carefully watch'd, to prevent Cracking, which it will surely do, if the Top of it is not stirr'd or broken a little with a Spade, and a little fresh Water and Earth pour'd over the whole, and then cover'd with Fern, or such like; but green Turf is much the best.

I have for several Years past made the Experiment upon Gooseberries and Currans, in the Manner I mention, in the Months, *May, June, July, and August*, and they never fail'd to ripen, and carry their Fruit very well the same Year, and grow vigorously. Again, one Good which attends this Way of Planting is, that Plantations of this Kind do not require any Waterings after they are once settled; for they presently renew their Roots, which those Trees planted about the Winter Months will do but indifferently the first Year, and sometimes not at all.

To remove small Plants from Place to Place, we may put their Roots in Bladders of Water, or of Earth and Water, and carry them Two or Three Days Journey with Safety; but if the Journey be long, I rather chuse Earth and Water finely mix'd, than simple Water; and a
Bladder

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Bladder may be tied close to the Stem of the Plants, without being in danger of breaking, as a Vial would do.

By this Method, and the Assistance of the prepared Gums, and a viscous Preparation, I have removed Peach-Trees, Nectarines, Pear-Trees, Plum-Trees, and Cherry-Trees, with Fruit upon them, both Green and Ripe, some of which Trees had been train'd against Walls upwards of Six Years; and tho' some of them were carried above Fifteen Miles, they grew perfectly well, and preserv'd their Fruit. So that by this Means any Gentleman that had a Mind to furnish the Walls of his Garden, might chuse his Fruit-Trees with the Fruit upon them, and have them remov'd to his own Garden at a Minutes warning: And besides the Satisfaction of knowing every Tree brought Fruit to his liking, he would have the Pleasure to have gain'd Six or Seven Years of Time in one Day; but it must be consider'd that such Trees will demand a good Price; for whoever parts with them, may at that Instant, in point of Plantations, be reckon'd to have lost Six Years of his Life, or to be Six Years older than he was before.

By this Method of Transplanting Trees, there is yet one Advantage, that if a Gentleman has planted a fine Collection of Fruit in his Gardens, and some Accident

dent may happen whereby he is obliged to quit his Garden on a sudden, his Fruit Trees may be remov'd with Safety from *May to August*, and he will lose no Time, and the common Practice tells us, the other Months are favourable to the Design.

This Year, in *April*, I remov'd an old Standard Plum-Tree at *Molesey*, when it was full in Blossom, and tho' the Three principal Roots were cut off each as thick as a Man's Wrist, and a proportionable Number of Boughs which corresponded with them, it is now growing and has several Fruit upon it; but the Method of moving a Tree in this State, to a little Distance, is very different to the moving a Tree with Fruit upon it.

In the doing of this Work, a Gardener must first be very cautious in applying the Mixture of Gums, and that he does not use that kind of Mixture which is made for Kernel or Pepin Fruit, to a Stone Fruit Tree, or the contrary.

Secondly, He must take care to plaister the wounded Parts of the great Roots as soon as each of them is clear of the Earth; and if the Trees are to be carried to any great Distance, to anoint their Roots as soon as possible with the viscous Preparation, for in hot Weather they will dry in a Minute.

I.

Thirdly,

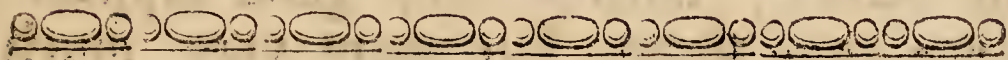
74 *Experiments and Observations*

Thirdly, If the Soil they are to be planted in be a Clay, we are not to make the Holes for the Trees in the Clay; for tho' we make them Twenty Foot wide, and were to fill them with the best sifted Earth with Water, the Tree will decline in the Winter, tho' it will not fail when we plant it in the Summer. In the Letter concerning Mr. *Potter's* Ranuncula's, we may see the Reason.

With the like Success have I transplanted Two or Three Elms, about Thirty Foot high, so that there has been no Appearance of their Removal, their Leaves have remain'd green and bright, and are now prosperous, their Heads are full, and they afford as much Shade since their Removal as they did before; and by the same Rule I am satisfied, that there is not a Tree in *England* which is found, and is not of more weight than can be transported from Place to Place, but might be transplanted with the same Safety as one might plant a Cabbage Plant; but there must be due Time allow'd to do it in, and the Planter must be very careful in using his Mixtures and Preparations, and the Labourers as careful in opening the Roots. So that in a few Days Time, if there was a sufficient Allowance of Men and Money, a House might be encompass'd with a full
grown

grown Wood, and a Garden compleatly planted with bearing Trees of every Sort of Fruit.


N. B. *The Mixtures of Gums for the several Kinds of Trees, and the viscous Preparations, will be prepared by Mr. Benjamin Whitmill, Gardener at Hoxton.*



To Mr. Richard Bradley.

Stoke-Newington,

S I R,

 Kept an exact Account of the Times of sowing Cucumbers the last Year for a forward Crop, and because I understand that several try'd to raise Cucumbers last Year at *Christmas*, and fail'd therein, I have sent you my Observations, that they may judge better this Year of the Times of sowing than they did the last. I am sure now, that I can produce a Brace of good Cucumbers in every Month in the Year, from what I have discover'd in the last Years Practice.

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July the 17th, 1721. I sow'd Cucumbers on the Natural Ground, to transplant them upon a moderate hot Bed; but these Plants were too forward for my Design.

Then I continued sowing every Week till the 26th of *August*, and then the Plants began to do Business; for those Plants that were sown the 26th of *August*, began to shew Fruit the Beginning of *October*, with a very good Appearance of a Crop, but were very much troubled with Earwiggs, which would destroy great Quantities in a Night's Time.

In *September* I sow'd Three Times, *viz.* on the 9th, the 19th, and the 25th; and those sown on the 25th, were the Plants that I cut my Fruit from on the 1st of *January*; but those sown in *October*, will bring a good Crop in *February*, with good Management. I conclude,

S I R,

Your most Humble Servant,

T. FOWLER.

The

The following Letter seems to come from *Farnham*, or thereabouts, as I guess from some Remarks which I have receiv'd written in the same Hand, and also from the Nature of the Soil mention'd in this. And as it relates to the Improvement of light Land by Brining of Corn, I think it very necessary to insert it, with a few Remarks.



To Mr. BRADLEY.

March 20. 1721.

S I R,



Inding by your monthly Treatises upon *Husbandry and Gardening*, that you disdain not to accept of the least Hints upon those Subjects, I thought it would not be taken ill if I should drop in my Mite.

A Sort of a Chymist came down to these Parts some Years ago, to teach us a
Dressing

78 *Experiments and Observations*

Dressing for Corn, by the Way of Brining; which applied to Wheat, or Barley, would, as he said, make the poorest Ground bear a Crop continually, and so rank, as that a Peck of Wheat less, *per* Bushel, would sow an Acre. Which some Gentlemen in this Neighbourhood tried, with Success, for Two Years; but the Undertaker came into these Parts no more, and, by what I find, he could not afford to Dress the Corn any longer at that Price, which was but Ten Shillings *per* Acre; whereas, had he demanded Twenty, those who have large Farms, with much light Ground, would have been glad of such a Dressing, for those Grounds which lay at such a Distance, that the very carrying out their Dung thither, would have stood them in as much.

In our Conference upon this Matter, I guess, that he dress'd with Oyl, alledging the Authority of *Virgil*;

Et nitro prius, & nigra per fundere amurca.

But we must consider that Advice to have been calculated for a Country where these *Feces* are cheap. But what is the Quantity proper for each Grain, and whether it should be simple or mix'd, to make the Corn imbibe it, and at what Price to be
pur-

purchased by those who have Use for a Quantity, I leave to the Curious to enquire ; and shall only add, that if such a Brining could be brought to Perfection, so as to answer the Design at Twenty Shillings *per* Acre, it would, for all the light Grounds in home Countries, be the most beneficial Improvement that has been found out in these later Ages, and particularly to him who could keep the *Arcanum* to himself so as to have the Monopoly. If you do think it Merits to be inserted amongst your Ingenious Discoveries, I wish our County the Benefit of it, and you, Sir, the Credit ; and am,

S I R,

Yours, &c.

T. S.

In answer to this Letter, I shall take Occasion to observe, that in the common Way of Sowing Corn, our Farmers always allow too much Seed : The Grains are laid so near to one another, that light Land cannot nourish them when they grow up ; so that for to allow a Peck less in every Bushel, is but reasonable, there will be more Nourishment for every

80 *Experiments and Observations*

every Grain, and every Plant consequently will have more Stalks and more Ears, and the Grains will be better furnish'd. I have try'd several Brinings for Corn, and one of them succeeds so well, that I have had many Roots that have produced upwards of one Hundred Stalks a Piece. Especially about the Skirts or Outside of the Ground. The Grains were laid about Six Inches apart, and eat down by Sheep; but as the Papers now in the Press cannot contain so full an Account of this Matter as is necessary to be given, I shall leave it till the Publication of the next Month's Remarks. Only shall hint this by the Bye, that Twenty Shillings *per* Acre will more then pay for the Brining.





To Mr. BRADLEY.

S I R,



and am

Have herewith sent you, according to your Desire, the List of those Plants which flower every Month in my Garden,

Your Humble Servant,

T. FAIRCHILD.



PLANTS *flowering in April.*

Stock-Gillyflowers, single and double, white and red.

Wall Flowers, white and yellow, double and single.

M

Plan-

82 *Experiments and Observations*

- Plantain leav'd Ranunculus.
Tulips of several Sorts, single and double.
Yorkshire Sedum, and the Bird's Eye.
Anemonies of various Kinds, the best Sorts.
Collection of Ranuncula's.
Collection of Daisies.
Candytuft-Tree, plain and variegated.
Laurustinus of several Sorts.
Nettle-leav'd Jessamine, *Spanish* Jessamine,
and the *Indian* yellow Jessamine.
Collection of Polyanthos, and Primrose,
double and single.
Black Helebores with a green Flower,
Fenel-leav'd Helebores.
Collection of Auricula's, and the Burrage-
flower'd Bears-Ear.
Crown-Imperials, ten Sorts.
Collection of Narcissus.
Star of *Naples*.
Simblaria.
Muscaria.
Dens caninus.
Hypericum frutex.
Violets double and single, white and
blue.
The single red Violet.
Hearts Ease of several Sorts.
Dwarf Flagg-Iris.
Virginian Colombine.
Wood Anemonies double and single.
Dwarf Almond.

Dwarf Hungarian Honeyfuckle.
Frittilaries, thirty Sorts.
Perwinkle double and single blue, and
single white.
Radix Cava.
Dwarf Medlars, two Sorts.
Purple and Ash-colour'd Pulsitilla.
Bulbous Violet.
Double Pilewort.
Lady's Mantle.
Double Lady's-Smock.
Purple and yellow Mountain Avens.
Aloe-leav'd and Onion-leav'd Asphodil.
Gentianella.
Ornithogalum.
Male Mandrake.
German Catchfly.
Tree Scabious.
Bladder-Nut.
White flower'd Male Cystus.
Starr Hyacinth.
Pearl Bugloss.
Italian Camomile.
Calcidonian Iris.
Doronicum.
Double Saxafrage.
Double flower'd creeping Crowfoot.
Meleanthus.
Venetian Vetch.
Sea Daffodil.
Globe Flower.
Scorpion Senna.

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Great blue flower'd Perwinkle.

Bird-Cherry.

Double white Mountain Ranunculus.

Sage-leav'd Cystus with a purple Flower.

Sweet Molly of *Virginia*.

The Tree-Milkwort with blue and white
Flowers.

Scarlet flower'd Horse-Chestnut of *Virginia*.

White flower'd Horse-Chestnut.

Persian Lilly.

Double flower'd *Solomon's Seal*.

Geraniums, several Sorts.

French Marygolds,

Oranges.

And the Aloe, call'd, by Dr. Comelin,
Aloe Africana humilis foliis ex albo &
Viridi Variiegatis.

Collection of Hyacinths.



*Flowers Blowing in MAY, besides those
which continu'd Blossoming, that were
mention'd in the foregoing Month.*

ORanges.

Lemons of several Sorts.

Pinks of various Kinds.

Collection of Tulips.

Lilly

- Lilly of the Valley.
Two Sorts of *London Pride*.
Ranunculus of the *Persian* Kind.
Double white *Narcissus*.
Sea Narcissus.
Fox Gloves.
Sweet William.
The Mule between the Sweet William
and *Carnation*.
Colombines.
Several Kinds of *Thalictrums*.
Double purple *Perwinkle*.
The *Pasque Flower* purple and ash Co-
lour.
Arbor Judæ.
King's Spear.
Aloe-leav'd Asphodel.
White-flower'd *Tree Scabious*.
Blue flower'd *Tree Scabious*.
Rosemary-leav'd Buckthorn.
Citissus Lunatus.
Four Sorts of *Corn Flags*.
Cistus several Sorts.
Camomile.
Flagg Iris, several Sorts.
Thrift or *Sea Pink*, several Sorts.
Rockets.
Persian Jessamine.
Lylacs three Sorts.
Peach-leav'd Bell Flower.
Hungarian Iris.
Laburnums, two Sorts.

Yellow

86 *Experiments and Observations.*

Yellow Martagon.

Geranium, several Sorts, among which
the sweet Night smelling Kind.

Double white Mountain Ranunculus.

English Hyacinths, white, blue, and
Peach-colour'd

The double blue Harebell.

Male Peony.

Hyacinth of *Peru*, blue and white.

Bleu Grape Hyacinth.

Atamasco Lilly.

Tradescant's Spiderwort.

The *Savoy* Spiderwort.

Fraxinella, white and red.

Blue feather'd Hyacinth.

Guilder Rose.

Yellow Jessamine.

Bleu Monk's-Hood.

Double white and red Batchelors-Buttons.

Germander-leav'd Chickweed.

Greek Valerian, white and blue.

Virginian Astragalus.

Bulbose Iris.

Roman and fiery Lilly.

Meum.

Syringa.

Widow wale.

Honyfuckles.

Tree Cinquefoil.

Day Lilly.

Sweet Lilly-Asphodel.

French Honeyfuckles.

Nastertium Indicum.

French Marygold.

Lyssimachia.

Lichnoides.

Valerian.

Double Featherfew.

Ficoides of two or three Kinds.



An ANSWER to some Objections lately made against the Circulation of the SAP, mention'd in the Chapter of the Improvement of TULIPS.

SINCE the Publication of my *Monthly Register of Experiments in Husbandry and Gardening*, for the Months of *April* and *May*, for this present Year, some of my Readers have thought it worth their while to take the Article of the TULIPS into Consideration, and totally deny that there is any such Thing as a Circulation of Sap in Plants. These, indeed, happen not to be of the first Rank among the Learned, and, by their Objections, plainly discover that they do not know what the Word *Circulation* means, and much less how it is perform'd.

I confess, I am not any Way displeas'd at any Objections that may be made by such People against my Writings, as it gives me Opportunity of setting them to rights, which I shall always be ready to do, when I have been too short in
N my

my Explications, to give them a full Satisfaction: For these Reasons therefore, I shall in this Second Edition explain to them what is meant by the Word *Circulation*, and open the Case to them in as plain Terms as possible; for without we have a right Knowledge of this Particular, all our Attempts towards the Improvement, or Preservation of Vegetables, will be as uncertain, as if a Man was to undertake the Practice of Physick, without any Understanding, or Knowledge of Animal Anatomy.

First then, Let us consider the Word *Circulation*, with Regard to its Signification; it is taken from the *Latin* Verb *Circo*, which signifies to go about, or search about: When we speak of the Circulation of Blood in Animal Bodies, we mean the going about of the Blood through all the Parts of those Bodies from its Fountain, and returning thither again; and in these Bodies, when ever that Motion of the Blood stops, Death ensues; so that to preserve Life in the Bodies of Animals, it is necessary the Blood be in continual Motion through the Vessels, and their several Branchings, or Ramifications, leaving, as it passes by the several Parts of the Body, such Juices as are necessary for the Nourishment and Support of each Particular, and at its Passage by the Fountain, renewing its former Vigour, and taking in a fresh Supply of wholesome Nourishment, to make good what it has lost in its Course, and to supply the same Parts it did before, as it passes by them.

This Motion of the Blood through the Arteries and Veins about the Body, is not in streight Lines downward and upward, but by many Thousand Turnings and Windings which correspond with every Part of the Body, so that no one Part is neglected by the Blood in its Motion about it. We may observe in the Foot of a Frog, the Tail of a *Neut*, or of a Fish, how finely the Blood Vessels are dispos'd, so as to feed every Part with due Nourishment; and in the Leaves of Trees, especially

cially in the Leaf of the Fig, we may easily discover the curious Distribution of the Sap-Vessels for the Nourishment of every Part of the Leaf, and that the fine Net-Work which we observe in that Leaf, is compos'd of Vessels through which the Sap circulates, or passes, is very evident, if we cut any one, or all of them, the Milky Juice immediately shewing itself, and flowing from the Vessels that have been cut.

The Plant which shews us the flowing of the Sap in the Leaves, and other Parts somewhat plainer than the Fig, tho' the Vessels lie more conceal'd in the Leaf, is the *Great Garden Spurge*, which I have cut and wounded in several Parts at great Distances from one another, and thereby prevented the Communication of the Sap with some of the intermediate Parts, so that if I made Incisions in those intermediate Parts, a Minute or two after I had cut cross one or two principal Vessels which led to them, there would no Milk flow from them. It is also possible by Ligatures, to stop the Course of the Sap, and prevent its Passage into any Part we are minded, which to me is Demonstration, that the Juices in Plants have a Motion throughout the whole Plant, or circulate about it as the Blood does in the Bodies of Animals, and not up and down only in streight Lines, as has been suppos'd by several Gardeners. Indeed there are in the woody Parts of Trees, streight upright Vessels, through which, I suppose, the Sap has a Passage, but these Vessels continue no longer streight than till they reach to a Bud, and then they branch forth and enter that Bud to serve it with Nourishment, to feed it till it is explain'd and open'd, and then branch again into the several Buds in that Branch, and so on till the Tree is fully perfected.

At the same Time we must take Notice, that the Vessels which I here mention to pass through the Wood, spread themselves, and are branched forth into the Roots, and are Inoculated into others;

thers; so that throughout the whole Plant there are Sap-Vessels, which maintain a Correspondence between one Part and another, from the extream Parts in the Head, to the extream Parts of the Root; so that there is the same Reason to judge, that, when any Part of the Tree is envenom'd, or poison'd in its Juices, the rest will be infected by it, as there is Proof that some of the Poisonous Matter taken from the Pustules of the Small-Pox, and inoculated in an healthful Person, will soon after shew itself in several Parts of the Person so Inoculated.

I have lately observ'd in a Gentleman's Garden near *Bristol*, some Plants of the *Brazil Jessamine* which were grafted upon the *Common Jessamine*, whose Leaves were very strongly blotch'd with Yellow; the *Brazil Jessamine* by this Means is so extreamly ting'd with Yellow, that there is hardly any Green to be found in its Leaves, by which it is evident, that the poisonous Juices which occasion'd the Blotches in the *Common Jessamine*, has by Circulation mixt themselves with the healthful Juices in the *Brazil Jessamine*, and has spread the Distemper over the whole, which could not be done by any other Means.

Another Instance of the whole Body of a Plant becoming envenom'd, by approaching a striped Plant to it, I have observ'd in Mr. *Fairchild's* Garden at *Hoxton*, he inarch'd a Branch of the *Brazil Jessamine* into a Stock of the *Common Jessamine*, whose Leaves were edg'd with White; the inarch'd Branch grew, and tho' it was not long before it was cut from the Mother-Plant, *i. e.* the *Brazil Jessamine*, yet the Juices in the whole *Brazil Jessamine* became ringed and spotted, but not with so strong a Colour as I observ'd in those which are grafted upon the *Yellow blotch'd Jessamine* mention'd above, which shews, that the Yellow Colour in Plants, is far more insinuating than the White. Mr. *Fairchild* has many other Experiments, which
prove

prove the same Thing, but I have not his Leave yet to mention them.

I have often thought, that when we had a Mind to make a Plant become striped, we might immerge some thin Pieces of Sponge in Juice of striped Plants, and bind them into the young Shoots of Plants, between the Wood and the Bark; this Way, I am apt to think, would cause Variations in the Plants they are inoculated into, as surely as that the Pufs taken from a Blotch of the Small-Pox, will disperse its Venon through the whole Body of a Man, soon after Inoculation; in either of these Cases, the Poison need be actually in a lively State when we apply it, but may be used some Time after it has been taken from its Original Seat.

In some of my Perambulations this Summer, I observ'd great Variety of Distempers in Plants, which occasion'd the striping of their Leaves, and I think an Account of them will not help a little to prove the Circulation of Sap through every Part of a Plant; observing in the first Place, that for the better Support of those Vessels which I have been speaking of, for the Conduction of Sap, there is a Sponge-like Body through which they all pass, and are thereby kept in their proper Station, and are also defended from the Sun, which would dry them up, were it immediately to come at them. This spongy Body is compos'd of small Vessels which are interwoven with one another, and have also a close Communication with the Vessels I have already mention'd, and imbibe a certain Moisture from the Air, which is necessary for the good Health of the Plant. For we find, that if we shut up a Plant in a close Place, where it is debarr'd from Air, it turns pale and sickly, and its Leaves and Shoots become faint and languid, even so as to bring Death upon the Plant: But this Sponge-like Body which terminates in the Bark of the Plant, when it has the Benefit of the Air, keeps the Plant alive, and helps it to resist the
Distemper,

Distemper, which it sometimes receives from the Nourishment it takes in at the Root, or by other Accident. And I find by Experience, that when this Spongy Part is infected, which one may know by Stripes of White or Yellow appearing in the Bark, there is no Remedy, or, in other Terms, there is no Possibility of ever getting the Stain out of the Plant, though we were to inarch twenty healthful Plants into it, and their Juices were to circulate thro' it for a Twelvemonth, yet all our Return would be to find that it would infect and tinge the healthful Plants with its Distemper.

But let us now see how differently Plants are affected by Distempers which flow in their Juices.

First, We have Plants which appear blotch'd with Yellow in their Leaves, only in the Spring and in the Autumn Seasons, but those Marks disappear by the Strength they gain in the Summer; *Rue*, *Thyme*, *Pot-Marjoram*, and *Stonecrop*, are often of this Sort. This Distemper is somewhat like the Scurvy, Itch, and such like Cutaneous Distempers, which generally appear about the same Seasons.

Secondly, We have Plants that are continually blotch'd with Yellow in the Spongy Part of their Leaves, whilst the Sap-Vessels are of a pleasant healthful Green; of such Sort, is the *Blotch't Alaternus*, the *Orange-Mint*, and some others: To give these Strength, by Means of rich Manure, or inarch them into healthful Plants, the Distemper will be overcome, and the Yellow Colour be chang'd into a lively Green: This is somewhat like the Jaundice in Animals.

Thirdly, We have Plants whose Juices are so inveterately poison'd, that their Distemper is continu'd from Generation to Generation; the Leaves of some are maculated, or spotted, others edged, others blotched, and others striped, such as the *Sycamore*,

Sycamore, Bank-Cress, Self-heal, Borage, Archangel, Water-Betony, and Striped Sallary; all which bring striped Plants from Seed, I think their Case is not much unlike what we observe in such Animal Bodies as are afflicted with such Hereditary Distempers, as the Evil, the Leprosy, or the Pox, sometimes happen to prove. We must observe, however, that all the Seedling Plants I speak of, are not affected alike, some are more striped, some less, and now and then some few will come healthful, and be entirely green in their Leaves. Surely such Plants, whose very Seeds do not escape being infected, could never be; if there was not as due a Circulation and Secretion of Juices in them, as there is in Animal Bodies. I suppose 'tis hardly possible to eradicate such Distempers in Plants, without a considerable Length of Time, and a vast deal of fresh Nourishment thrown into them.

This Knowledge leads us partly to the Cure of Distempers in Plants, and also will instruct us a great deal in the Pruning them, and the Seasons for it; nor does it inform us less of the Cautions to be taken in the Removal of Plants, or of strengthening our Flower-Roots for future Blowing; for it has been experienc'd, that in Plants of the lower Race, when they are cut down near the Root, at a Time when the Sap is in its highest Vigour, such Plants have always been weak the following Year, and have sometimes perish'd. The curious Mr. *Fairchild* observ'd, that one Summer he had a Bed of *Striped Lillies* which were rising to flower, were in the Height of their Sap cut off by Lightning, and the next Year scarce one in an Hundred was strong enough to blossom; and the second Year, not above four in the whole Bed were strong enough to blossom; so if we make any great Amputation upon any Tree of our own Growth, when the Sap is in its full Vigour, it will weaken and endanger the Tree.

But

But I shall now conclude, with acquainting my *Reader* that as this is an Addition to my Monthly Papers for *April* and *May*, since the first Edition was sold off, so any one who has the former Edition of these Months, may, by sending their Book to the Publisher, have this Part added to it, without any Expence; and likewise I shall take this Opportunity of laying before the Publick, what they are to expect in my succeeding Papers for *June* and *July*, which are now in the Press. In the first Place, I have given the necessary Directions for the Management of a Kitchen Garden, for a Family of six or seven Persons, and from that Number to twenty or thirty in Family, wherein the Produce of one, two, or any Number of Rods of Ground will be set down, whether set with Beans, Pease, Artichoaks, or other useful Herbs for the Kitchen, a Thing much wanted, but never before made publick. To this will be added, an Account of many useful Experiments, with a Practical Method of making Cyder with about half the Quantity of Apples generally made Use of; also some new Observations relating to Summer-Houses, Grotts, and Fountains; with an Account of an extraordinary *Roman* Pavement, lately discover'd in *Goucestershire*.

F I N I S.





T H E

Monthly Register

O F

Experiments *and* Observations

I N

Husbandry and Gardening;

F O R T H E

Months of *June* and *July*, 1722.



THE

1852

Monthly Register

1852

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of the

A GENERAL
T R E A T I S E
O F

Husbandry and Gardening.

CONTAINING

Such Observations and Experiments
as are New and Useful for the Im-
provement of Land.

W I T H

An Account of such extraordinary In-
ventions, and natural Productions, as may
help the Ingenious in their Studies, and pro-
mote universal Learning.

With Variety of curious CUTTS.

*For the Months of JUNE and JULY,
The Second Year.*

By RICHARD BRADLEY,
Fellow of the Royal Society.

L O N D O N :

Printed for T. WOODWARD, at the Half-Moon
against St. Dunstan's Church, Fleet-Street ;
and J. PEELE, at Locke's Head in Pater-
Noster Row. M.DCC.XXIV.



TO
Sir *NICHOLAS CAREW*,
OF
BEDDINGTON,
IN
The County of *SURREY*, Bart.

SIR,



AM encouraged to
Introduce these Pa-
pers into the World
under Your Patronage, from
the Extraordinary Regard
You

The Dedication.

You shew for the Subject they treat of.

YOUR Delightful Gardens at BEDDINGTON would alone be enough to draw upon You the Admiration of that Part of Mankind who study the Useful Pleasures and Tranquility in Life.

AND when we take a View of those Wonderful ORANGE-TREES which Your Noble Ancestors first made Familiar to our *English Climate*, and observe their Prosperity, and behold the agreeable Structure you have
rais'd

The Dedication.

rais'd for their Preservation,
This, SIR, loudly proclaims
Your Genius worthy of the
Ancient and Venerable Fa-
mily You are descended
from.

AS the Defign of the
Work which I now lay be-
fore the World, is, To In-
troduce among us such Plants
from Abroad, as may be
Useful and Delightful to our
Nation ; so I am assured,
That nothing can be more
prevailing over the Minds of
my Readers, than to Intro-
duce it under the Protection
of

The Dedication.

of a Gentleman who has so
Capital an Instance of the
Probability of what I pro-
pose, and who is so Generally
Admired for every Action
of his Life.

I am, SIR, with great Respect,

Your most Obedient

Humble Servant,

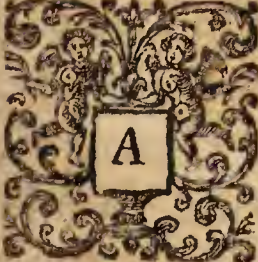
RICHARD BRADLEY.



THE
Monthly Register
OF
EXPERIMENTS
AND
OBSERVATIONS
IN
Husbandry and Gardening.

For the Month of JUNE, 1722.

RULES for Methodizing and Assorting a Parcel of Ground for the Use of a Family of Seven or Eight Persons; or from that Number to Twenty or Thirty in Family.

 **A**MONG the Many I have conversed with of all Nations, and all Degrees, I find one Humour generally prevails in Point of Gardening; which is, That the more profitable a Garden is, the more it is admired; and the End of making and keeping a Garden,
B is,

is, besides the Advantage it will bring to the Master of it, the Pleasure of having every Fruit and Herb brought fresh to his Table.

In the Course of my Observations, I have found this Design carried to a great Length in some few Places; but, on the other Hand, great Numbers have failed in the Execution of their Design, either by over-cropping their Grounds, or by wrong proportioning their Quantities of Herbs or Fruit, or by neglecting to contrive a due Succession of their Crops.

The Over-cropping or Stocking of a Ground, in the first Place, robs it of its Strength, and where Plants grow too close together, whether their Roots or Tops are to be eaten, they are always small and useless, the best Seeds of Cabage-Letuce will produce Plants of no Value, if they want Room; the Seeds of the largest Roots will produce nothing of moment, if they do not stand at a right Distance one from another, which the Houghs used in the Gardens about *London*, will, in some measure, help to teach us. The Blades of the Houghs for Turneps, are about five or six Inches wide, while those for Onions, are but two Inches: But these Instruments I chiefly mention, because they are seldom used in the Countries remote from *London*; for when the first

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first has gone through the Plants, though the Blade is but five or six Inches wide, yet the Turnep Plants remain generally about seven or eight Inches asunder, from the irregular coming up of the Seeds; and so the Onions will, after Houghing, stand about four or five Inches asunder, which is full near enough, if we expect to have them good, and well-rooted; and even at such a Distance, they will very well allow a good Draught to be made, during the Summer-Season, which will still help the remaining Plants to enlarge their Roots. So Cabage-Letuce, to have them good, should stand a Foot apart, if we plant four or five Rows in a Bed; but if they are planted in a single Row, we may set them nearer together; for every Plant which we expect to bring a large Head, must have Room for the Air to circulate freely round it; for if that is not allowed, the Plants will never spread, but run upright, and their Leaves will be watery and insipid.

The Roots either of Turneps or Onions, which commonly *Apple* above Ground, are always larger, as they have more Room and more Air about them; and then the Leaves are short, and the Juices are employ'd principally in the Roots. So in Carrots and Parsnips, though they run downwards into the Ground, yet as

4 *Experiments, &c. in*

their Green Tops spread more or less, their Roots are smaller or larger.

The second Mistake, is, The wrong Proportioning the Quantities of these Esculent Herbs and Roots in a Garden, by which means we super-abound in one Thing, while we are in want of another; and happens chiefly from our judging wrong of the Nature and Design of the Things we plant or sow, or of their Use at the Table, or the Time which every Sort will last good.

We are to consider, that Pease will require more Room than any other Thing in a Garden, considering their Table-Use; for the Fruits of many Plants must go to make a Dish, and then a Crop of Pease seldom lasts longer good than Three Weeks or a Month; but then, because we must have many Plants, we are not to crowd them close together; for then we shall have a smaller Quantity of Fruit; and besides, the first Gathering when the Lines of Plants are too close together, breaks and bruises the Plants, so that they do not even bring a Quarter-Part of their Crops to Perfection. I have experienced, that ten Rods of the Ronceval, and *Dutch* Admiral Pease, have yielded more Fruit when their Lines have been set wide enough asunder, and have been well Stick'd, than three times the Quantity

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tity of Ground has done, where the Rows were as many more in Number, and twice the Quantity of Seed put into each Row: And besides, those that had Room enough, have brought good Pease for above ten Weeks together, by being water'd now and then, and the Pease gather'd carefully from them, without bruising the Plants. But though we might reckon ten Rods of such Pease to be enough for a Family, yet when we come to provide Carrots or such-like Roots, two or three Rods will prove much more advantageous than the ten Rods of Pease; for in the Roots there is little or no Waste; but there must be many Plants of Pease to yield as much profitable Eating, as one Carrot or Parsnip will do. I suppose a Carrot Root that requires about eight Inches Square of Ground, will fill the Space of a Pint; and the profitable Part of the Pease that require a Yard Square of Ground to grow upon, will hardly be more than half as much, considering what Air they must be allowed; and so every Thing in a Garden, according to the profitable or useful Part of it, should be consider'd.

Again; We ought to know, what Herbs or Roots are chiefly used or covered in any Family, and proportion our Stock of every sort accordingly; for otherwise,
though

6 *Experiments, &c. in*

though our Garden be fully cropt, yet if the favourite Herbs or Roots are not in full Quantity to the Master's Will, the Blame will fall upon the Gardener, and thus, much of the Garden, though it be fully cropt, becomes useles. Therefore, it would not be amiss, for a Gardener to enquire at his first coming into a Place, what Herbs or Roots will be chiefly expected or used in the Family, that they may be the Objects of his Care. And this leads one to consider,

Thirdly, The Neglecting to contrive a due Succession of Crops; for in that Case, we may lose half the Profit of our Ground, which ought never to lie idle; for, by good Management, one Acre may be render'd as profitable as four or five, with injudicious Management. Let us never be too late in preparing for our Winter Standing Crops; for we may lose a Third or Half Part of our Winter Store in Quantity, by a Fortnight's Neglect, and also the Goodness of our Crop will not bear any Comparison with such an one as has had due Time to strengthen it self. We should consider the Nature of the Plants we shall want, and when one sort begins to decay, turn up the Ground afresh, and renew it with another Sort of Plant; considering at the same Time, that one Tribe of Plants does not draw

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draw from the Earth the same Nourishment that another Sort will do; and therefore, always change the Tribes, and the Earth will have Nourishment enough for all, regaining what Strength she has lost by one Sort, while she is distributing to the others. The Sowing of Pease, then Turneps, and after them, Corn, is one Instance that Land will bear several Crops successively to good Advantage, without Manuring; but there are many more Instances to prove, that the Earth can never be render'd unprolifick, unless she is constantly constrain'd to feed one kind of Herb or Plant.

After these Hints, I shall proceed to a more particular Enquiry into the necessary Furniture of a Kitchen-Garden, for about seven or eight in Family, which is the Proportion I chuse, because there are more Families in *England* of about that Number, than of any other; and because also, I have been solicited by some particular Persons, to inform them of the Profit of a Garden for such a Family. What I shall say upon this Occasion, may likewise assist in the Accounts I shall give hereafter of the profitable Production of larger Gardens. But I must give this Caution with my Calculations, That bad Seasons, and other Accidents, must be allow'd for, they

8 Experiments, &c. in

they may sometimes cross our Expectations.

One of my Correspondents, Mr. A. B. has a Garden to be disposed after this Sort, which consists of about Sixty Rods of clear Ground, or Eighty Rods, were we to reckon the Walks, and the Ground whereon is planted the Espaliers of Fruit Trees? But let us now examine, what may be done with the Sixty clear Rods of Ground, which is such a Piece of Land as will very well supply a Family of about seven or eight Persons, with every Thing necessary; and first, of the Standing Crops, or such Herbs, Roots, and Plants, as are to remain for a long Time in one Place. In which Parcel of Ground is likewise included a Space for Hot-Beds, &c.

For the Hot-Bed Ground, we may allow four Rods of Land, after the Rate of sixteen Foot and a half Square each Rod. In this Piece of Ground, when it is fenced, we may employ four Frames, with three Lights apiece, for the Production of our earliest Cucumbers and Melons, and for the Raising our Annual Flowers, to be planted for Ornaments in the Borders among the Fruit-Trees. The Method, see in my *Kalender*. In this Piece of Ground, tho' we employ only four Frames, yet we must set apart two Rods, that we may have

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have Room to shift the Frames or Hot-Beds, so as to preserve a Succession of Heat to the tender Plants; and the other two Rods will serve for one Ridge of Cucumbers, and two of Melons, each Ridge two Rods long, and about five Foot wide, including the Allies. If we have two Ridges of Melons of this Length, we may have about sixteen Holes of Plants, and upon each Hole, with good Management, we may have three or four good Melons at least; so that our Crop may amount to about Thirty Brace, besides what we might expect from our forward Beds.

The Ridge of Cucumbers will bring a plentiful second Crop, that is to come in about the middle of *May*, when the first Crop in the Frames begins to decline; but for the three Ridges, we must have two Dozen of Glass Bells at least. At the Back of the Frames, we might also have a few Kidney-Beans; but they must be well taken care of, lest they over-grow the Cucumbers and Melons. And upon the Side of one of the Beds, when it begins to cool, we may sow Sellery.

But besides the early and the second Crop of Cucumbers, we must provide some to succeed for the later Months, and those must be sown in the Natural Ground. These are generally called *Picklers*, and for that use, should be gather'd as soon

10 *Experiments, &c. in*

as the Fruit first appears. For this Use I have allotted two Rods of Ground; but as this sowing is not to be 'till near the beginning of *May*, we cannot propose to inter-plant the Cucumber Holes with any thing, unless it be with Cabage Lettuce, or Radishes, which will be off before the Cucumbers can hurt them.

Ground for pricking out of young Plants, and for young Salads; 3 Rods.

T H E next Spot I shall take Notice of is, A Piece of Ground for pricking out of Seedling Cabages, Savoys, Cauly-Flower Plants, Sellery, Endive, Annuals, &c. and for raising young Salads upon: And for that Use, I allow three Rods, which is sufficient for the Plants which are necessary to be raised for such a Family, 'till 'tis their Time to be planted out at due Distance for perfecting themselves. This Parcel of Ground will certainly contain a greater Number of young Plants, than can be planted out for good, in such a Garden as I mention; but as the Expence of a little Seed, is no great Matter, we shall gain this Advantage by it, that we shall have enough to guard against Hazards of Weather, &c. and, perhaps, to oblige a Neighbour.

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We must, also, allot Half a Rod of Ground, in some By-place, for a Plantation of Horse Radish, and another Half Rod, for a Plantation of Skerrets and Eschalots.

Ground for Pot-Herbs, 4 Rods.

THE next Parcel of Ground must be appointed for twelve Beds of Pot-Herbs, which, allowing five Foot and half for the Breadth of each Bed and Ally, will take up four Rods of Ground; and should be planted thus, *viz.* Two Beds of Minth, one of Red-Sage, one of Sage of Virtue, one of Peneveroyal, one of Hyfop, one of Winter-Savory, one of Sweet Marjoram, one of Burnet, one of Clary, one of Thyme, and one of Parsley. I omit to mention Borage, Rosemary, Angelica, and Lavander, for these Beds, because Borage will certainly find some Place or other among the other Crops, and Rosemary will do well in By-places well exposed; as Angelica will fill some of the most shady Corners; and for Lavander, it will do best in an Edging; and one may likewise have Edgings of Sorrel and of Parsly; for we should sow Parsly twice every Year, and especially a good Crop against Winter. When a large Bed will afford but little, we may sow a Line of

Marygolds in a spare or vacant Place, rather than make a Bed on purpose, because they do not last. I have allow'd full Ground enough in the above Articles, and besides, as All Men are not of the same Taste, perhaps, some of the Herbs I mention, may not be thought useful; if they are not, the Ground may be planted or sown with other Things. But it is very necessary, however, to plant our Pot-Herb Garden as near the Kitchen as possible.

Ground for Asparagus, 3 Rods.

WE come in the next Place, to provide such a Crop of Asparagus, as may sufficiently supply a Family of seven, to have a good Quantity every Day, from *April*, that they begin to come up, 'till *June*, that we must leave off cutting them. I reckon, that little more than three Rods of Ground is sufficient; that is, to have four Beds of Thirty-three Foot long each, and the Breadth of each Bed four Foot, and the Allies two Foot. These Beds, when they are full cropt, will afford us about Seven or Eight hundred of Asparagus in a Week, which, I suppose, will be enough for such a Family as I mention; and they will last good about nine Weeks. The Method of preparing and planting these Beds, may be seen in
my

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my *New Improvement of Planting and Gardening*, and also some Particulars relating to them, in my *Monthly-Papers* of the foregoing Year. However, the Plants must be set about ten Inches apart, and be Plants of one Year old.

But besides these Beds of Asparagus for the Spring Season, I allow three Rods of Ground for Seminaries and Plantations of Asparagus for the Use of Hot-Beds about *Christmas*, or in the Winter-Months: I have directed their Management in the above-mentioned Books.

The first Year of planting the Asparagus Beds, we are to sow the whole Piece with Onions, which will afford enough for a Family of six, for one Year; for we should not open the Allies 'till Winter, and then the Earth taken out of them, must be flung upon the Beds.

If these Beds lie all together, they should run North and South, because we should set a Row of forward Beans in each Alley every Winter. We must note, also, that the first Year, by sowing Onions upon these Beds, we shall have three Rods of Ground to spare in the other Part of the Garden.

Another Standing Crop is our Artichokes, for which I allow two Rods of Ground, wherein the Lines are to be three Foot asunder, and the Plants in each
Line

14 *Experiments, &c. in*

Line to stand about two Foot apart; so that in such a Spot of Ground, we shall have about One hundred Plants; out of which we may expect as many good Flowers, and about half as many indifferent good ones, besides small ones, which are excellent fry'd, or eaten raw with Pepper and Salt. Between these Rows of Artichoke Plants, we may in the Spring have a Crop of Spinach and Radishes.

In the next place, we are to allow two Rods for Raspberries, which should be planted in single Lines, rather than in Beds: The Lines should be 4 Foot asunder, and the Plants in each Line a Foot apart; so they will bear better, and bring larger Fruit. The Lines of Raspberries, at four Foot Distance, and a Rod in Length, will be ten in Number, and between these Lines we may have eight of Coleworts, for the Spring Service, when Greens are scarce, which is chiefly occasion'd by the turning up our Ground in *February*, to be fresh cropt. But I come now to speak of Crops which are of short Duration, and must be renewed every Year, and even some of them twice and three Times in a Year, or at least to be so planted, as to follow one another in different Seasons. I shall begin with the Bean.

Ground

Ground for Beans.

BESIDES what we have mentioned of Beans to be planted in the Asparagus Allies, we must at least allot four Rods more of Ground for Family Use; that is, three of them to be planted for Summer-Crops, with the broad *Windsor*-Bean so as to make two distinct Crops; the other Rod, as well as those planted among the Asparagus, must be for early Spring Crops of the *Hotspur* or *Spanish* Bean: And of these, besides what I have said of the planting them, and cutting them down, to vary the Times of their Ripening, we may still gain a late Crop from them, if we cut down a Parcel of them after all the Beans are gather'd: They will spring from the Root afresh, and bring us a middling Crop late in the Year.

Among my Enquiries this Year, I have examined into the Quantity of broad Beans that a Rod of Ground will produce, planted with double Lines a Foot asunder, and the Distance of two Foot between the double Lines. The Bean Plants are supposed to be six Inches apart.

In a Rod of Ground, at this Rate, will be seven double Lines, or fourteen Rows of Beans; each Row of Beans will contain about Thirty-four Plants, and a double
Row

Row Sixty-eight Plants, which in a Rod amounts to Four hundred and Seventy six Plants.

I have observed several Parcels of Beans this Year of the Broad or *Windsor* Kind, and I find that they are very inconstant in their Bearing, some Plants bringing Five-and-twenty Cods, others Eight or Nine only: So that were I to make a moderate Computation, one would suppose every Plant could hardly bear less than ten Cods, reckoning one with another; and in some of these Cods, it is not very rare to find three Beans, though more generally two, but for the most Part but one Bean in a Cod: However, to judge as low as possible, I shall only reckon, that a Plant will bring ten pure Beans clear of the Cods, though I have numbered above twenty Blossoms upon a Plant.

In the Measure of the Broad Beans, when they are taken out of the Cods, I find that Fifty Beans fill a *Winchester* Pint Strike-Measure; so that then we may expect from a Rod thus planted, about 47 Quarts of Beans Strike-Measure, or somewhat less than ten Gallons Heapt-Measure. We may remark, that if we were to set the Beans nearer together, they would bear less Fruit. However, at the Rate I set down, we may suppose, that 3 Rods will produce about 30 Gallons
of

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of broad Beans, clear of their Shells; but this must be while they are fit for eating; for when they dry, they will lose above two third Parts of their Measure; that is, a *Winchester* Pint, Strike-Measure, will hold about One hundred and Fifty Beans, so that a Rod will take about three Pints of dry Beans to plant it.

The *Spanish* Bean is of a much smaller Kind, than the former; but is a great Bearer, so as to bring, on every Plant, twice the Number o Beans generally found on the *Windsor* Kind. One of the *Spanish* Beans is about one third Part as big as a *Windsor*-Bean; so that I compute, that a Rod of the *Spanish*-Bean, will yield about six Gallons, or about two third Parts as much in Measure, as a Rod of Ground planted with *Windsor*-Beans; and those among the *Asparagus*-Beds, will yield as many more, and especially because these Plants have more Air. So may we compute the Whole to amount to about twelve Gallons, which will very well afford us good part of Sixty Days Diet, besides some Dishes from *After-Crops*: While we have these in Use, let us spare those Roots and Herbs which will hold good in that Season. The proper Directions for managing these Crops, I have laid down in my *New Improvements*.

Ground for Pease, 8 Rods.

I H A V E observed in my *Introduction* to this *Chapter*, that the Pea requires more Room than any other Thing in a Garden, and have given some Reasons why it is so; therefore I allow in this Garden, 8 Rods of Ground for Pease, besides the Advantage we may have of shifting the Pease in the Ground I allow for Carrots, which is 3 Rods, so as to set an early Crop of Pease upon it; for the Carrots must be taken out of the Ground when they have done growing, and laid by in dry Sand. So then we shall have eleven Rods of Ground for Pease, besides a Row, if we please, close under a South-Wall to be Stick'd up: Though they will not rise very high, yet they will bear better, and ripen sooner, than if they were to lie upon the Ground.

But suppose we begin with the Carrot-Piece, for an early Crop of Pease; sow the Lines double and the Pease four or five Inches apart, and the Lines about ten Inches asunder to be staked up; but the Allies between the double Lines, must be about two Foot Wide, so that we may have six double Rows in a Rod, or in three Rods, about eighteen double Rows, of sixteen Foot and a half long. Now
were

were all these Pease to stand the Weather, which is very doubtful, if we put them in before the End of *November*, then there would be about One hundred Plants in a double Row ; and a single Plant of this sort will bear, if it be Stick'd up, about twenty Cods, which will carry from about five to seven Pease apiece, whose Pease, when they are about the Bigness of the following Letter [O], will fill a Strike Quarter of a Pint, Wine-Measure, from One hundred Cods ; that is a Pint from Four hundred Cods, or a Quart from Eight hundred Cods ; so that we must have Forty Plants, to produce a Quart of Pease for the Table, of the Bigness I mention ; or if we allow for Hazards, and suppose Fifty Plants to yield a Quart, then a double Row of Plants will yield about two Quarts ; and the three Rods of Pease, or the eighteen double Rows, will yield Thirty-six Quarts, or nine Gallons, Strike Wine-Measure: But if we measure them by the Heap'd *Winchester-Quart*, and allow for the Loss of those which will grow too old for eating green, we cannot well reckon above five Gallons of clear green Pease for the Use of the Table ; so that we may have about a Dozen or Fifteen good Dishes of Pease from this Parcel.

The other Ground we allot for Pease, which is eight Rods, should be divided into three Parcels, *viz.* Three Rods for the Sugar-Pea, to be sown in *February*, after the manner of the former, which will follow the earliest Crop in ripening, and yield about five Gallons of clear Pease, *Winchester-Measure*, besides several Quarts for Seed or Winter Use; though it is customary to sow them in single Rows, and then the Allies between the Lines, must be about two Foot and a half asunder.

We are next to sow three Rods of large Pease, such as the *Spanish-Mooretto*, or the *Rounceval* or *Dutch Admirals*. These must be planted in double Rows in *April*, the Lines of Pease to be a Foot apart, and we must allow half a Foot on the outside of every double Line, to place our Stakes, which Stakes must be bushy, such as the Boughs which are generally cut for Bavin, called *Brush-Wood*. These ought to be full seven Foot long, so that they be allow'd above half a Foot to be in the Ground, and that the two Lines be tyed together on the Top, so as to be full six Foot high. The Figure of this Staking, at the Ends of every double Row, will almost represent the Letter [V] revers'd, and every double Row of Stakes will measure near two Foot at the Bottom. Between every two double Rows of
Stakes,

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Stakes, we must leave a Passage of four Foot wide, so that then there will be about six Foot from the Outside of the first double Row, to the second double Row. So in three Rods we may have five double Rows of these Pease about Thirty-three Foot long each. By this means, if they are Staked early enough, and water'd in a dry Time, and, above all, carefully gather'd, or as I used to direct, *i. e.* To cut off the Pease with Scizzars; after this manner, they will last bearing a long Time, and produce near twice as many Pease, as those that are order'd the common Way. About Fifty Cods will yield of clear Pease, as many as will fill a Quarter of a Pint, Strike Wine-Measure; or Four hundred Cods will yield a good Wine-Quart; and a Plant preserv'd in Health, will bear about Thirty Cods: But supposing them to bear only Twenty Cods apiece, then a double Row of Thirty-three Foot long, allowing the Pease to stand at least six Inches apart, will yield, when they are taken out of the Shells or Cods, about seven or eight Quarts, and the whole about Thirty-five Quarts, or somewhat more than nine Gallons, Strike Wine-Measure, or for eating Green, about seven Gallons *Winchester*-Measure.

There

There remain yet two Rods to be sown with the same sort of Pea in *May*, for a late Crop which will afford us above four Gallons of clear Pease, *Winchester-Measure*: So that the Produce of eleven Rods of Pease, thus order'd, will be about Twenty-one Gallons of clear Green Pease for eating, besides a good Quantity for Seed. Such a Quantity may serve to afford us, at least, Fifty large Messes, to be gather'd between *May* and the End of *September*; and if there should be more than we can dispense with while they are Green, we may use them dry in the Winter, for boiling; and the Rounceval Pea especially is extreamly good. It would be well to plant one Rod of this Piece, with the sort of Pea which is common in *Holland*, which the People eat Shells and all, as we do Kidney-Beans.

Ground for Kidney-Beans, 2 Rods.

THOUGH I allow but two Rods of Ground for Kidney-Beans, we are to understand, that they will afford as much profitable Fruit, as four Rods of Broad-Beans, for in these there is no Waste; and from the Time of the first Crop's beginning to bear, about the Middle of *June*, they continue Good 'till the End of *September*, with a little Care.

In

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In setting of these, the Lines should be single, and about three Foot distant from each other, whether they are to run up Sticks, or if they are of the new Dwarf-sort, which does not climb at all; for they will spread more than a Foot and a half, and therefore should be set about six or eight Inches asunder in the Lines, and have Liberty to spread in the Allies: Besides, Room must be left sufficient to walk between the Rows. We may set a Rod of each Sort, one in *April*, and the other in *May*, especially the climbing Sort, the latest of the two; for the Dwarf-sort is the most hardy, and bears very plentifully. If they are well managed, we may reasonably expect from the two Rods, above three Bushels of Beans fit for eating, and they will be an agreeable Change among the Summer-Crops.

Ground for Colly-Flowers, 2 Rods.

I ALLOW two Rods of Ground for Colly-Flowers, which we must plant about three Foot asunder, that they may spread their Leaves, and bring large Flowers, which they will not do, if they stand close together: So in the two Rods to be planted three Foot asunder, we shall have about Sixty Plants, or about ten every Week,

Week, while they last. The Method of managing them for the Spring and Autumn Crops, is in my *Kalendar*. Note, These 2 Rods are for the Spring Crop, to serve part of *May* and *June*; and when they are off, the same Ground may serve to plant out our Sellery for Blanching. The Rows for Sellery must be better than two Foot apart, and the Plants six Inches asunder: From whence we may draw Sellery from *August* 'till *February*. Or if we think that this Spot of Sellery will be too much, plant part of it with Endive for Blanching; but if we use it Stew'd at the Table, or in Soup, we must find some other Spot to plant more of it; for these Ways of using it, destroy a great deal.

Ground for Cabages and Brocoli, 5 Rods.

I RECKON there cannot well be less than three Rods of Ground employ'd for Cabages, and especially if we have a little Warren of that sort mention'd in my last Year's Remarks. The Cabbage-Plants standing at two Foot Distance, will give us about Twenty Rows of sixteen Foot and a half long, or One hundred and Eighty Plants; which, besides the regular Cabages they will produce, will furnish us with a large Store of Young Sprouts,

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Sprouts, even exceeding the Cabages themselves in Goodness.

I also allow two Rods of Ground for Brocoli, which being planted at about a Foot Distance from one another, this Spot of Ground will carry about Two hundred and Fifty Plants, whose Business being chiefly to sprout, the Plants do not require to stand at so great Distance as the Cabages. 'Tis the Flower-Stalks of this Brocoli, that are used at the Table. They must be taken just when they are shooting to blossom, and the outer Coat or Skin of them pil'd off; they boyl in about three or four Minutes, and eat as well as Asparagus.

Ground for Savoys, or Savoy Cabages,
2 Rods.

THOUGH we are provided with three Rods of Cabages, we may yet allow two Rods of Ground for Savoys, which in the Winter, and towards the Spring, will afford us a very agreeable Variety. These must be planted at the same Distance as Cabages, and then the two Rods will bear about One hundred Twenty Plants, the Offal of which will help to feed our Warren. When we plant our Ground for Cabages and Savoys, we might sow it with Spinach and Ra-
B dishes,

dishes, which would be fit for the Table, before the Plants began to spread.

Ground for Carrots, 3 Rods.

SUCH a Piece of Ground will afford us a large Quantity of Roots, either to be drawn in the Summer, or for Winter-Use, and in them there is no Waste; for what we can spare, the Hogs will eat, and the Green Tops will be of Service to the Rabbits. So that in one shape or other, they will all come to the Table. These, if they stand at a right Distance, will be in Number about Four hundred upon a Rod, or about One thousand Two hundred upon three Rods of Ground. Besides, we may sow with them some Sorts of Cabage-Letuce, which will be fit to eat before the Carrots begin to grow large. *Note, Cabage-Letuce will boil very well.* Upon this Piece of Ground, when the Carrots are off, it is, that I have propos'd sowing our early Crop of Pease, or if we were to suppose this Piece of Carrots to bring only a Thousand Roots, they will last a Family of six or seven very well for six Months, to be dress'd every Day.

Ground

Ground for Parsnips, 2 Rods.

THIS Ground must be sown when we sow our Carrots; but the Root must not be taken up 'till *November*, and then be lay'd in the House. We may have about Six hundred Roots in the two Rods, if the Seed be good, and if they are more than we can use in the Kitchen, our Swine will feed extreamly well upon them. These are for our Use in the Winter and Spring, and, if managed according to my Directions in my *New Improvements*, will last good 'till *June*.

Ground for Potatoes, 3 Rods.

THREE Rods of Ground, well planted with Potatoes, will yield us about six Bushels of Roots; but we must not expect any other Crop upon it while the Potatoes are growing. Such Land as is esteemed the worst, will do well for these Roots: And considering how much Profit they bring to a Family, I wonder they are not more generally propagated in the poorer Parts of our Country.

Ground for Onions, 3 Rods.

THESE three Rods may be employ'd the first Year of making our Garden, for a Crop of Pease for Seed, or for boyl-
ing in the Winter; for the first Year, we shall have a sufficient Quantity of Onions upon our Asparagus Beds. This Piece being employ'd for Pease, will yield in a Summer about five Gallons of clear Pease, after they are thresh'd; and when it is used for Onions, it will bring about three Bushels in a Summer. But in this, as in other Parcels of Ground, which I have mark'd, we must observe, That every Crop we sow in it, be of a different Tribe from what has been before, and so shift the Crops on each Spot of Ground every Year.

Ground for Turneps, Summer-Crop, 2 Rods.

I ALLOW two Rods of Ground for a Summer Crop of Turneps; for though our Garden will be well stored in Summer with many Varieties, we should by no means be without some Turneps, to change now and then with our other Garden-Dishes. They will, moreover, be of good Help to our Warren, and their Offals will likewise assist to feed our Swine,

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so that nothing will be lost. These Turneps will stand at about the same Distance as the Parsnips; so that in the two Rods we may reckon about Five or Six hundred Roots. When the Turneps are off, this Piece may be sown with Spinach for Winter.

Let us now see what Profit we may expect from our Sixty Rods of Ground, full cropt, as I have directed. The Account is as follows.



TABLE



T A B L E

OF THE PROFITS

ARISING

From the afore-mention'd Sixty Rods of Ground, planted as aforesaid.

Number of Rods of Ground.	Profits of the said Rods of Ground.
A	<p>Melons in one Frame, about . . . 1e</p> <p>Melons on the two Ridges, or } 6e 16 Holes</p> <hr/> <p>In all Melons 7e</p> <hr/> <p>Cucumbers in 2 forward Frames, abt. 6q</p> <p>Second Crop of Cucumbers upon } 16e one Ridge of 8 Holes, reckoning } 20 Fruit on each Hole, which is a } very small Number</p> <hr/> <p>In all Cucumbers 22e</p>

4 Rods for the Hot-Bed Quarter, will carry 4 Frames, and 3 Ridges; 2 of which should be for Melons, and one for Cucumbers. The Produce of these will be also annual Flowers, Sellery, and Collyflower Plants, &c.

4 Rods Carry'd over

4 Rods brought over.

B

2 Rods are allow'd for Pickling Cucumbers, set in Holes four Foot asunder, or in Lines to run up Stakes, may contain about 32 Holes, or 13 Lines of Plants, besides Cabage-Letuce and Radishes, which will soon be off

Cucumbers 30 on each Hole, will amount to in this Piece } 960

We may safely reckon 1000, if they are well managed.

C

3 Rods of Ground for young Salads, pricking out of Plants, besides Fenel, Dill, and Rocambole

Young Salads of Cresses, Chervil, young Radish, young Turnep, or Rape, young Mustard, young Lettuce, Taragon, Purslane, Nasturtium Indicum; and in the Winter, brown Dutch Lettuce, half Cabaged. From hence, and the other double-cropt Parts, we may gather a Salad every Day in the Year. Salads } 360

D

1 Rod for Horfe Radish, Skerrets, and Eschalots

Half a Rod of Horfe-Radish, will afford Roots about . . . } 150

Quarter of a Rod of Skerrets, will contain Plants about 150, and 'tis common to have 3 and 4 Roots on each Plant, so we may reckon } 400

Another Quarter planted with Eschalots, will produce about Pounds Weight } 120

E

4 Rods of Ground for Pot-herbs will produce

Mint, Sage, Penderoyal, Hyfop, Winter Savory, Sweet Marjoram, Burnet, Clary, Parsley, Thyme, Sorrel, Rosemary, Burrage, Angelica, Lavendar, Baum, some sort or other to be gather'd every Day in the Year. Parcels . . . } 365

F

2 Rods of Asparagus in full Crop, will produce

Asparagus, after the Rate of 700 per Week, and lasting good for 9 Weeks, will bring about, Hundreds } 60

Or the first Year about two Bushels of Onions, if they are healthful. }

17 Rods Carry'd over

Asparagus carry'd over : : : 60

32 Experiments, &c. in

17 Rods brought over.

Hundreds of Asparagus brought over 60

F

2 Rods of Asparagus for Hot-bed Use, will produce } One Hot-Bed, which may be planted with 1 Rod of Roots, full Crop, will produce abt. Hundreds } 2

Hundreds of Asparagus in all : . . 68
Or Buds, in Number 6800

G

2 Rods for Artichokes, will produce, besides Spinach and Radishes in the Spring } Of good Flowers or Heads, about ! : 150
And of Suckers or small Flowers, abt. 150

H

2 Rods of Raspberries planted in Ten Rows, will produce, besides Colewort Plants, &c. } From the Ten Rows of Raspberry Plants, we may gather about . . Gallons } 5

Changeable Crops.

I

2 Rods for Beans are principally set aside for Summer-Use } From 3 Rods of broad Beans, if they are set wide enough asunder, we may expect of Beans, clear of the Shells . . . Gallons } 30
From 1 Rod of Spanish Beans, clear of their Shells } 6
To which we may add the like Quantity of Spanish Beans from the Asparagus Quarter } 6
In all, we have Gallons 42

K

3 Rods of Ground for Pease; principally set apart for that Use in Summer: As also of Pease sown upon the Carrot-Quarter } Three Rods of the Sugar Pea, will yield of Pease clear of the Shell, about . . . Gallons } 5
Three Rods of Rounceval, or Dutch Admiral Pease, will yield of Pease clear of the Shells, abt. Gallons } 7
Two Rods Spanish Mooretto, clear of the Shells, will yield . . Gallons } 4
To these we may add the Produce of three Rods early Pease sown upon the Carrot Quarter, which will yield about . . . Gallons } 5
In all the Measure of Pease clear of the Shells, will be about Gallons, Winchester-Measure . . . } 21

25 Rods Carry'd over.

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35 Rods brought over.

L
 2 Rods for Kidney-Beans : } The Produce of Two Rods }
 of Kidney-Beans, will be about } 4
 Bushels }

M
 This Piece will afford us about }
 Sixty good Colliflowers in *May* } 60
 and *June* Flowers }

2 Rods are allow'd for Colly- }
 Flowers, for the Use of the }
 Spring, and the same Ground } 450
 to be afterwards trenched, }
 for blanching of Sellery . . . }

Which may serve for 100 Salads, }
 or if used in Soups, or Stew'd, will }
 not last above 30 Days, for a dozen }
 Plants will make but a little Shew }
 at the Table, in those Dresses }

N
 The three Rods for Cabages }
 will afford us about } 180
 Heads }

3 Rods for Cabages : }
 The Sprouts of the same will }
 amount in Quantity to about as } 180
 much as the Neat Cabages: So }
 that to reckon them as Cabages }

Then in all, besides the Offals }
 for Rabbits, there will be to the } 360
 Quantity of }

O
 Two Rods of Brocoli will con- }
 tain about Two hundred and Fifty }
 Plants, from whence, when they }
 are in their sprouting Perfection, }
 we may gather about eight or ten }
 Sprouts apiece, as big as Asparagus: } 2000
 The best is to take them when }
 their Sprouts are pointed with the }
 Flower-Buds a little before they }
 would blossom. So we may ga- }
 ther about Sprouts }

We may reasonably expect }
 from these Two Rods, of good } 120
 Heads, about }

P
 2 Rods for Savoy Cabages }
 But as these come towards }
 Winter, their Sprouts will be but }
 few. However, their Goodness }
 makes amends. We shall reckon } 50
 the Sprouts of these equal to }
 Fifty full Heads }

In all : : : : : 170

47 Rods Carry'd over

34 Experiments, &c. in

47 Rods brought over.

3 Rods for Carrots : : : { I compute that this Piece will
bring of good Carrots about . . . } 1000

2 Rods for Parsnips : : : { On this Piece of Parsnips, we
may expect, Roots, about Five } 600
or }

3 Rods for Potatoes : : : { These Three Rods of Ground
will yield us of Good Potatoe.
Roots, about . . . Bushels . . . } 6

3 Rods must be allow'd for
Onions after the first Year ;
but as the first Year we shall
have a Crop of Onions upon
the Asparagus Beds, we shall,
during that Time, sow it
with Pease for Winter-boil-
ing }
These three Rods will bring
us of clear Pease, after Thrashing,
about . . . Gallons . . . } 5

2 Rods for a Summer Crop of
Turneps } This Piece of Ground for Tur-
neps, will contain, of Roots, abt. } 600
Five or }

60 Rods the Total.



H A V.

HAVING taken a View of the principal Crops to be raised in this Parcel of Ground, we must observe, That as soon as any of them are off about *July*, we must then provide for the Winter; such as Carrots, Spinach, and such others as we may chiefly desire; and if we should happen to have more Ground vacant than we could well Crop at this Season, it should be trench'd up, to lie open the Winter, for Spring-service.

From hence we may observe, how a Piece of Ground of Sixty Rods may be disposed for a Kitchen Garden, and what will be the Produce of it, if the foregoing Directions are exactly follow'd: I have likewise endeavour'd, in the parceling it, to set down the Quantity of every Sort, either of Herb, or Root, which may be produced upon each Parcel appointed; but I desire my Reader will have this Regard to a Calculation of this Nature, that bad Seed, or bad Seasons, may sometimes bring him short of his Expectations; and when I suppose a Number of Roots upon a Rod of Ground, they may not all, perhaps, be fit to bring to the Table. And again, we must observe that every particular Gentleman has a Taste to himself, which may make him desire either more or less of each
Sort

Sort of Herb, than I have appointed. It will then be necessary for him to consider well of what he likes best, before the Work is undertaken, and from these Tables to collect what Quantity he may reasonably expect or desire from this or that Proportion of Ground, and then judge how to parcel his Garden, so as to reap his Desire from thence ; for, I suppose, one great Reason why so many complain of their Gardens and Gardeners, is the want of this Consideration, and of giving their Gardeners a List of what Things they most delight in ; for without such Instructions, it is the Business of a good Gardener, when he has a Ground under his Care, to have something of every Sort, and perhaps those Things which he has happen'd to cultivate in the greatest Quantities, may prove the least acceptable to the Master, and then so much Ground is, in effect, lost to the Owner ; or if there should happen to be the largest Share of the Ground cultivated agreeable to the Owner's Desire, yet whatever is not so, is sometimes esteem'd as so much Loss, unless we allow such a Parcel of Land for the Entertainment of those of our Acquaintance, who differ from us in their Taste of Garden-produce.

But

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But let us consider a little further of this Matter, with regard to the Number in Family, who are to partake of the Product of our Garden, and besides the singular Taste of the Owner, which must be first regarded, let those Things be cultivated which are useful in the Family-Diet; for whoever has seen the Fruiterers Bills for Herbage and Roots to Families, which are pretty Numerous, will find that a Garden does not a little contribute to save in the Expence of House-keeping: It is not very rare to see Bills from Fruiterers and Herb-shops, of one Winter's standing, to amount to Sixty, Eighty, an Hundred, and sometimes an Hundred and Fifty Pounds, where the Families are large; and then let us judge whether that Article is not worth Consideration; or whether a Garden of our own, well-ordered, will not be advantageous to us: And besides the Crop we have in the Winter, our Summer Crop is still much more profitable.

When I first calculated the foregoing Tables, my Design was to dispose of Sixty Rods of Ground for a particular Friend, that he might guess, as near as possible, how his Family of about 7 or 8 might be serv'd by such a Quantity of Ground with Things useful for the Table; and, without regarding any particular Taste of his, I was
desired

desired to introduce as many Sorts of Things as I thought Necessary and Useful; and I think, as I have dispos'd it, there will hardly be a want of any Herb or Plant throughout the whole Year, even tho' he does not declare his particular Fancy till after all is planted; for otherwise, as I hinted before, such a Spot of Ground adapted to the Mind or Custom of a Family, so that it should contain only some particular Things; Such a Ground, I say, might be made to supply 10 or 12 in Family, Pease excepted, provided it is not shaded with Standard Trees, for when those are found in such a Piece of Ground as this, altho' they are not planted very close together, yet such Herbs, Plants, or Roots, as are under or near their Shade, never thrive or come to good, tho' the Seeds were of the best kind.

The Reason why I except against Pease in such a Piece of Ground, when it is to furnish 10 or 12 in Family, is, Because they, in the first Place, take up more Room than any Plant belonging to the Kitchen Garden; and, in the next Place, a Crop of Pease, when it becomes fit for the Table, soon grows beyond the Table use; they grow old presently, and become fit for nothing but to save for Seed. Indeed some of the *Spanish Moretto* or *Rouncevals*, will bring good Crops,
and

and last a long time, with good Management; or we may set some of the smallest Dwarf Pease, so as to bring their Crops at different Times from those planted in the Neighbourhood.

From what has here been said, I suppose, it will not be difficult for any one to judge of the Product of any Quantity of Ground, and to direct how much of each Sort of Herb, Plant, or Root, should be raised in a Year for the Use of a Family of 6, of 10, 20, or any greater Number of Persons: And besides, we may yet expect no small Benefit from some Fruits which may be trained in Espaliers, and from Gooseberries and Currans, which may be planted in proper Places in the same Garden; but we must always have a Regard to place such Plants at good Distance from one another, so as to have the Air and Sun free and open where we raise any of the Herbs or Roots which we sow Annually, otherwise they will run upright, and never SET to any Substance.

I cannot well conclude this Piece, without putting my Reader in Mind, That in *August* and *September* it will be a proper Time for him to examine the Fields for Mushrooms: In order to provide himself with that sort of Earth which is found about their Roots, and is full of fine
White

White Threads, and sometimes has little White Knots appearing here and there in it; for this Earth contains what is necessary for the Production of Mushrooms, and must be kept dry till we apply it to our Mushroom Beds. I generally put it in a Paper Bag, and keep it in a Room where there is a Fire; for if it meets with Wet, or Moisture, it rots, and when our Mushroom Beds are made according to Art, every bit of such Earth half an Inch Cube, will furnish a Quantity of Mushrooms which will spread their Roots near two Foot. The *French* Gardeners save large Quantities of this Sort of Earth every Year, and keep it in large Clods in a dry Room till they use it in their Beds; and tho' it is kept sometimes for 12 Months, yet when it comes to be buried half an Inch in the Beds, which are moderately warm, and has been water'd for a few Days, it springs out Mushrooms. I have a Prospect this Season of getting a large Quantity of this kind of Earth, which I hope will be a means of prevailing with some of our Gardeners to begin this Piece of Gardening, which will furnish us at every Season of the Year with this valuable Curiosity. We are to note, That a common flat Hot-Bed will not serve to raise Mushrooms upon to turn to any Account; for tho'

we find them often upon Old Melon-Beds, yet their Growth there is uncertain: But a Mushroom-Bed, properly made, will give us a Crop in a Month or Six Weeks after making; Which I shall explain as fully as possible, as soon as I have try'd some few Experiments that are now at Work.

There is one Thing which I cannot pass by in this Place un-observ'd; which is, That after we have taken Pains to establish a good Garden, we find ourselves often at a Loss to know how to use the several Parts of its Furniture either to our Pleasure or Advantage; and for want of such Skill, the better Half of our Product is commonly thrown away: 'Tis therefore I am industrious to usher into our World, that useful Piece written Originally by Monsieur *Chomel*, and printed at *Paris*, called *Dictionary Oeconomique*, or by us, *The Oeconomical, or Family-Dictionary*; which is carefully improved from some of the best Writers of other Countries, as well as the Curious of our own Nation; so that I do not know any Book extant, which is more publickly Useful, or privately Beneficial, that treats of the same Subjects. The Undertaker of these Two Large Volumes being now very much advanced in the Work, by Subscription, I am still the more forward to take this Notice of it:

G

I have

I have now no more to say, relating to the Subject of the foregoing Month, and shall therefore proceed to give my Reader a very curious Letter, communicated by an Ingenious Gentleman.





THE
Monthly Register
OF
EXPERIMENTS
AND
OBSERVATIONS
IN
Husbandry and Gardening.

For the Month of JULY, 1722.

To Mr. BRADLEY, &c.

SIR,



SINCE you are arrived to that Perfection, as to be able here at Home to make Climates answerable to any whatever assign'd Abroad; and produce Equatoreal Heat in the Latitude of Fifty-one and a half; and since by that means we shall be able to propagate in *England* whatever Fruits, Plants, or Flowers, which being either Useful,
G 2 Curious,

Curious, or Profitable; are produced in the warmer Climates; and which, I doubt not, but in time it will be thought a National Interest to have naturaliz'd here: I believe, it will not be improper for Seamen to cultivate a Correspondence with you, since thereby we may perhaps point out something but little, if not intirely unknown to our *English* Gardens.

Indeed, Two Things have prevented Sea-faring Persons from bending their Thoughts this way: First, A Persuasion that Vegetables produced in those hot Climates, could not live with us; which Impediment you have now removed by your Stoves, Hot-beds, &c. The Second is, That we being but little acquainted with the Vegetable World, know not which are Rarities, which not; which you have already got, and which are intirely unknown to you. Which Difficulty I hope you will also remove by publishing a Catalogue of such *Exoticks* as you have already: and also, what others you would chiefly wish to be brought over to you; as likewise the Methods of doing it with most Likelyhood of Success. In the mean time, I shall venture to mention to you some Things which I thought most remarkable, when I us'd the Sea; not doubting your candid Acceptance of my well Meaning, however imperfect my
Per-

Performance may be. And the first thing I shall take Notice of, is, The *Palm-tree of Guinea*, the Juice of which is not only a pleasant Drink, but also reckon'd so effectual against the Stone, that I have heard the old *Guinea* Surgeons give their Opinion, That it would as easily dissolve the Stone in the Bladder, as Water does Loaf-Sugar. And I can speak on my own Experience, that it is a most excellent Diuretick, and so effectually cured me of the Gravel, that I have not been troubled with it these 23 Years since.

Palm Oyl is also excellent in several Cases, as Aches, Sprains, Bruises, Swellings, and also often taken inwardly by the *Negroes*; but for what Distempers I had not Language enough to inform my self.

Their *Yamm* is of the Potato-Tribe, but vastly larger; it is more mealy, is of a larger whiter Grain, which shines like that of double-refin'd Sugar, and is extremely nourishing.

The *Coco-Nut* is pleasant to the Taste, and the Milk or Water contain'd in it Diuretick; but the Tree being very tall, and a slow Grower, will hardly be worth our attempting here.

The *Water-Melons* are a most curious Fruit, and deserve our greatest Application; There are two Sorts, the Red and the White, but the Red are best. They
are

are eaten commonly cut out in Slices, but the Pulp mashed, and eaten with *Madera* Wine and Loaf Sugar, is incomparably fine.

I come now to our *West-Indies*, where they have a *Red Potato*, which is as sweet as a Parsnip: And at *Barbadoes* they make of it a very pleasant Drink, which they call *Mobby*, which I believe would take mightily with our Quality here in Summer; for it cools, and must be good against Consumptions, as all the Potato-Tribe are; and, to take off the Windness of its being bottled, 'tis generally drank with Wine.

The *Barbadoes China-Orange* far exceeds the *Lisbon* in the Richness of its Juices. They have also a Fruit of the *Orange* Tribe called a *Shaddock*; 'tis from four to eight times as big as an *Orange*: 'Tis a most noble Fruit to look at, and not unpleasant to the Taste; besides, the Blossom is very large, sweet, and fine, like the *Orange*; There are Two Sorts of it, the Red and White; the Red is the preferable.

The *Guava* is a very good Fruit, so is *Plantain*; but the *Bonana* is very fine, and could it be produced here, would answer the Cost and Trouble. The *Lime* is very good against the Scurvy, and some prefer the Punch made of it, before that of Limons; 'Tis hardy, and whereas it
grows

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grows well in the Island *Majorca*, where they have sometimes much Snow, I doubt not but it would thrive with us, and make a most beautiful Ever-green Hedge. I wonder the *Sugar Cane* has never been attempted in our Stoves, upon the Account of its being the finest of Pickles.

The *Mango* of *Malabar* would be of great account in our Gardens, and would be prized more for the Delicousness of the Fruit; than the Excellency of the Pickles. And since I am upon the Subject of Pickles, I have heard that our large white Plumb has been attempted with Success that way. And that the small Capers of *Majorca*, are thought to exceed the large Ones of *Toulon*.

The *Indian Corn* is what I believe would very well deserve our Cultivating here; for if an Acre of Reeds is worth two Acres of Corn, here you would have Reeds and Corn too, and the Corn (besides several other Uses) is so excellent for fattening Hogs, that it makes their Fat hard as Brawn, and not flabby, as ours generally is; The Reeds make a lasting and impenetrable Thatch, small Fences, &c. and the Produce is prodigious.

The *Cranberry* would also be very well worth your Care; it would bear our Winter abroad extremely well, and would
re-

require the Stove only in Summer, when your other *Exoticks* are all abroad.

I much admire that none of our Quality have essay'd to make the *Virginia Nightingale* and *Mocking-bird* Natives of this Island; for tho' that Country is hotter in Summer than ours, yet they have some Winters colder. A Friend of mine, who had a Grove near his House, had one got loose, who continued in the Grove 'till *January*, that some Boys came a Shooting that way, after which it was never heard of. If we were but industrious this way, our Woods would in a short time Rival our Operas; and our Songsters from *America*, put those from *Italy* out of Countenance. I should not even doubt, but that the *Jamaica* Nightingale, with his most sweet Note, might be Naturalized here; since the *Turtle-Dove*, which is a Native of the hotter Climes, does very well wild in our Woods, as I have often observ'd between *Petersfield* and *Portsmouth*.

'Tis a Pity, no-body has essay'd to make the *Prickle-pear* of *Jamaica* useful: I am perswaded it would make a beautiful and lasting Dye, if any ingenious Person would set heartily and in good earnest about it.

When I contemplate on that eternal Verdure, which reigns over all that Part of the Torrid Zone that I have been in, I
am

am amazed from whence it is, that Nature supplies those vast Trees and other Vegetables, with Moisture sufficient to maintain them, not only with Life, but in flourishing Beauty, without one Drop of Rain for Six Months together; a parching Sun daily exhausting them, and the Earth so dry, as to be cleft several Yards deep: Should I conjecture 'tis from the vast Dews that fall every Night, it would thence undeniably follow, That there is a Circulation of the Juices in Vegetables; and that the Branches assist the Roots, as well as the Roots the Branches: But this is a Piece of Philosophy not yet universally establish'd, and which I must leave to your Greater Genius and Experience to enlarge upon. Being, with all Submission.

S I R,

Your Most Humble Servant,

Octob. 4th 1722.

S. C.

To Dr. Bradley, R.S.S.

The foregoing Letter, has Four Things in it, which I esteem to be highly considerable in Point of Gardening, and its Use. The *First* is, Of Climates, and of their being Artificially made with us: The *Second* is, To find out the best Methods of Importing Foreign Plants to this
H King-

Kingdom. *Thirdly*, The Necessity of making known to the World, the Uses and Virtues of such Exotick Plants, as are brought to us. And, *Lastly*, What is extremely worth our Consideration ; which is, That Plants have a considerable Share of Nourishment, which they draw from the Air, by way of their Leaves and Bark, as well as from the Earth and Water by means of their Roots.

As to the first Part of this, which intimates, That we have in some measure initiated the warmest Climates of the World here in *England*, by Artificial Heats ; It is true, we have now in Practice several Ways, which have been lately try'd for the Production of Heats of almost every Degree necessary for the Welfare of Plants of Foreign Countries, and the last Year has given me the Pleasure of finding, that those Methods I have recommended in my former Papers, have had such good Success, that more Gentlemen have taken that Part of Gardening upon them, in the last twelve Months, than has been known for many Years before. 'Tis evident too, That where we can, by such means, render Exotick Plants any ways useful, tho' there is some little Expence or Trouble in bringing it about, yet a little extraordinary Trouble, when it is crown'd with reasonable Profit, will not be grudged by

by the Undertaker. The late Instance of bringing the *Ananas* or Pine-Apple to Perfection in *England*, by the Ingenuity of Mr. *Telende* at Sir *Matthew Decker's*, has so far gained upon the Curious, that already many of our Nobility have undertaken the same Improvement; and 'tis not to be doubted, but a Year or two more, will make this Undertaking much more General; And then I have good Hopes of seeing my Desires completed, of introducing all the *West-Indian* as well as *East-Indian* Fruits among us. But there is one Caution I must give my Reader by the bye, concerning the Use of *Tanners-Bark*, which is the principal Ingredient contributing at present to the raising these Plants of the Hot-Countries, and the Hints I shall offer, will, I hope, prevent some few Mistakes, which are now likely to happen to some of the Practitioners, who too rashly judge of *Tann* or *Tanners-bark*, thinking that it is capable of warming a large Body of Air above it, in the same Degree that the Body of Bark is warm'd below by Fermentation. Those who have not fallen into this Error, I suppose, have strictly follow'd the Dimensions and Method of Mr. *Telende's* Hot-Beds; that is to say, They have made the Frames for their Hot-Beds of *Tanners-bark*, exactly of the same Dimensions of those

at Sir Matthew Decker's at Richmond, and, besides allowing the same Quantity of *Bark* to each Bed, take Care likewise to have Repositories for their Pine-Apples in the Winter, of such sort as Mr. *Telende* sets the Plants under his Care into, in the Winter-Season, which is regulated by Fire only: And this I find necessary for the Winter is, because, as the *Bark* has not a Power of itself to warm a large Quantity of Air above it, so the Plants that are set into it in the Winter, tho' it will warm their Roots and set them growing, yet the Leaves or Parts above Ground being restrain'd from Growth by the greater Cold of the Air above, cannot receive the Nourishment into them that the Roots receive from the Earth; for which Reason, where the *Bark* is used in Winter, we should have some other Artificial Warmth to regulate the Air above, and dispose the Leaves or Branches of such Plants as have their Roots plunged in the *Bark*, to receive Nourishment from them, or else put the Air above into such a State as may help to feed the Plants. I suppose, that this can be only done by Fire, or, in other Terms, an Air warm'd by means of Fire, and then the Space above the Bed of *Bark*, may be more extensive than otherwise can be allow'd. Where these two Warmths concur, it is not to be doubted

doubted but any Plant of the warmest Clime may grow there, and we must remark, That in Mr. *Telende's* Frames there is such a Proportion of Air for the Plants above the Bed of *Bark*, that the Sun in Summer can sufficiently warm it, for the Maintenance of the *Ananas*; but in the Winter we must have Recourse to other Help, such as that of Fire; for the Sun is not then strong enough to warm the Air above the *Bark*.

This *Bark* is likewise of extraordinary Use for making Plants strike Root quickly; and as there is little or no Steam rises from it, so the Leaves of such Plants will not be endangered, as oftentimes those are which are set upon Hot-Beds made of Horse-Dung.

We must observe too, That the *Bark*, when it is just taken out of the *Vats*, is subject to heat with Violence, and grow moldy on the Top, and then speedily lose its Heat; but the best *Bark* is that which has been out of the *Vats* about a Fortnight before we use it, and that will heat gently and gradually, and continue hot a long Time. But this by the bye.

The *Second* Thing to be considered, is, The Method of Importing Plants and Seeds from Foreign Countries with Safety; and how such Gentlemen who go abroad may judge of the Plants they meet
with

with in Foreign Parts, whether they may be acceptable to us, or not.

As to the bringing over of Seeds and Plants, I have been pretty Large upon that Head in my *New Improvements* and other Writings of Gardening; but I shall take occasion here, to mention Two or Three New Particulars which are necessary to be observed in those Cases: I have already said, That 'tis the best way to gather the Seeds in their Shells and Cases, and so to bring them to us; for besides the Help such Cases will be to preserve the Seeds during the Voyage, they will help to inform us of what Class or Order the Plants are of which they were taken from; or if we have occasion to bring over Plants in Boxes of Earth, we may sow some of the Seeds in those Boxes of Earth, especially those of the Tree-kind, because by that Time they come to us, they may be in some Forwardness to grow: But if we have not this Convenience, we may follow the Method sent me by a very curious Gentleman, whose Name I know not, but as it carries a Face of good Reason with it, as far as that can guide me, it has my Approbation, and it is this; When the Seeds are gathered, and as well dry'd as the Warmth of the Air of the Place can do, or a warm Pocket will do in three or four Days, then put them into a Glass Bottle,

Bottle, or glazed Vessel, closely stopp'd, rather with a Stopple of the same Sort than with a Cork; for a Cork is apt to rot by change of Air: and then we must take care to have this Stopple well cemented with Pitch, or Bees-Wax and Rozin; the said Vessel must then be placed in a larger Jar, or Vessel of glazed Earthenware, and the intermediate Space between both, be filled with common Salt, even so as to cover the Stopple of the Seed-Bottle with Salt. By this Means, I judge, that it will be impossible for any of the Seeds to be injured in their Passage through different Climates; for yet I cannot discover, that any Sort of Insect can live in a Body of common Salt; or where Salt is the Medium justly regulated between the Air and the Body, then such Body cannot putrify so as to be render'd a proper *Nidus* for any Insect to lay its Eggs in: We have many Instances of Flesh that has not putrified after it has been well prepared with Salt, and it is as rational to think, that Seeds or Plants may be as well preserved by it, when we consider the Ways of Pickling some Sorts of Fruits, which by only putting Salt to them, they are preserved many Months, when of themselves they would rot and be destroyed in a few Days.

This

This Salt also corrects the extraordinary Heat of the warmer Climates, and by its being thus made the Wall, as I may call it, between the hot Air and the Seeds, so through its Fixation and Coldness, it is not to be supposed, that the excessive Heat of the hottest Climates can penetrate through it, so as to occasion any considerable Decay in the Seed: And we may consider likewise, That as this Salt is first fixed by extraordinary Heat, so we cannot suppose, That while the Seeds are passing through the hot and dry Climates, the Salt can suffer any great Change or Alteration; and so it is as natural to suppose, That the Seeds which are under its Shelter, cannot be much altered; and we well know, that a Climate about the Latitude of ours, is rarely disposed to melt Salt, so that under such Shelter we can hardly find any Seeds to be brought to us that will not be in good Perfection. And this has led me often to admire at the Principles in Nature, that dispose some Bodies to fix themselves from Liquids by Violent Heat, and others, which are in their Principle as Liquid, to be only fixed by Entrance of Cold. 'Tis a Subject worth Consideration, and will greatly help to the Design which we have now before us; but my present Opportunity will not allow me to inlarge upon it, only by the bye
I shall

I shall observe, that some Plants do not grow in the Summer Months, but only have a vegetative Motion in the Winter; and others are only in Motion in the Summer, and upon the least Approach of Cold, are fixed, and lose their Vegetation.

But to return to my Subject; We are next to consider of the best Means for the Transportation of the Plants themselves, and that may be done, in a short Voyage, without any Earth about the Roots, if they are Trees of any Substance, that is to say, of an Inch, or an Inch and Half Diameter in the Stem; but they must be very clear of Wet before they are pack'd up, otherwise there will be a Ferment about their *Bark* which will destroy them. I have known some Trees, which have grown after they have been without Earth for Ten Months, Orange Trees especially; and a Willow Twig, which I used to carry in my Hand for more than Ten Months, is now, after Five Years sticking in the Side of a Bank, become a good Tree.

But for Transporting of Plants, which require Earth to grow in while they undergo a long Passage, I can give no better Directions than what I have lately observed in a Letter of Mr. *Mark Catesby*, a very ingenious Gentleman, written from *Carolina* to Mr. *Fairchild*, concerning the

Carriage of Plants by Sea, which he has had good Experience of, as appears from the many Varieties of *Virginia* Plants which of late Years he has sent over to *England*; and is as follows.

To Mr. FAIRCHILD.

S I R,

I Desire when you send Plants by Shipping to remote Parts, to send them in Tubs, and not in Baskets; for Baskets contribute much to the Miscarriage. Winter is the best Time; October if it could be, and to put the Tubs in the Ballast, which keeps them moist and moderately warm. So managed, I have had best Success with Plants from England; for on the Quarter-Deck they are often wetted with Salt Water, and require the greatest Tendance from bad Weather, and even with the greatest Care they miscarry, as they did with me. It is so hot in the Hold in Summer, that they spend their Sap at once, and dye, so that that is not a Time to send any Thing.

Mark Catesby.

I had almost forgot one Thing, relating to the Carriage of Seeds from one Place to another, which this Gentleman usually practised with Success, *i. e.* That he

he always used to put the Seeds in the Shell of a Gourd, and seal them up, and by that means I have not known them to miscarry, in several Parcels which he has sent from *Virginia* to *England*.

Now we are come so far, it is necessary that we observe, that a Catalogue, however necessary it is, of those Plants which will be acceptable to us, will fill up a larger Volume than I propose in these Monthly Writings; and then too we are in want of many of the Names, given them by the People of the Countries where they grow, and to call them only by the Names given them by our *Botanists*, would not be intelligible to any but such as have studied *Botany*; so that at present, I know no better Way than advising in general all those Gentlemen who use the Sea, and are disposed to collect either Plants or Seeds Abroad, to let them be chiefly of such Sorts as are useful in their Timber or in their Wood for Dying, or in their Roots, Fruits, &c. for Physick or Diet. Indeed so far we may venture to prescribe, in particular, that the *Guava* brought over to us in Plants, suppose of an Inch Diameter in the Stem, and likewise the *Tamarind*, in the same State; might be made to prosper with us; and so too the *Plantains* and *Banana's* of the *West-Indies* should be brought to us in

Plants of some Strength, if we expect to have the desired Success with them; the Cinnamon-Tree also from *Ceylon*, the *Pimento* from *Jamaica*, and any other Spice-Trees rather in Plants than in Seeds; or if the fresh Seeds of the Nutmeg could be gathered, they may be planted in a Tub of Earth about Two Inches deep, or coated with Clay about Two Inches thick, or dipt in Bees-Wax. Ginger without curing, if the Roots are moderately dried in the Pocket or the Sun, will come well to us: The Mango is likewise very desirable, and I doubt not, but the Stones, if they are preserved in Clay, or Bees-Wax, or Earth, may be easily made to grow here with our Stoves. I am persuaded, by some Experiments made by *William Parker of Healing, Esq;* that all Plants which have Rezinous Juices, will bear our Climate without Shelter; for that curious Gentleman has already tried a vast Variety of those Kinds in the open Ground, and some of them, which are Natives of the warmer Climes, are as unconcerned at our Winters, as if they were Natives of our own Climate; and I have found, that the Plants of *China* and *Persia* do very well with us. As for Melons, Water-Melons, Gourds, or Pumpkins, and Squashes, we have already, I believe, most of the Sorts, though there
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are few among us that use their Fruit, except of the first Sorts.

The Gentleman who has been so kind to send me the Letter which has occasion'd these Observations, mentions a Thought of his concerning the Naturalizing the *Lime*, or Wild Lemon, as some call it, in our Climate. I find, that this sort of Plant is apt to bear Fruit plentifully with us, and to ripen its Fruit well, which is a certain Sign of its Welfare in our Latitude, and all the Orange or Lemon Race are hardy enough to stand the Winter with us, in common Green-houses; and even some are hardy enough to stand abroad in our most Southern Quarters.

The greatest Adventure of this kind that ever was attempted in *England*, was that famous Introduction of the Orange-tree and Myrtle by Sir *Francis Carew* and Sir *Walter Raleigh*, who whilst they resided in *Spain* in Queen *Elizabeth's* Time, chose these Fruits for our general Entertainment, and first made them familiar to our Climate in the Year 1585, when these Great Men discover'd the building of the *Spanish Armado* against us. Tradition informs us, these Orange-trees were immediately brought to *Bedington* in *Surrey*, one of the Seats belonging to the ancient Family of the *Carews*. They were then in Cases, and there was at first no other Safe-guard

guard for them in the Winter, than setting them into a Pit in the Ground, and covering them in severe Weather with Boards and Straw ; and they were thus preserv'd for several Years, 'till at length it was judged practicable to plant them in the natural Ground, where they have remain'd in extraordinary Health and Vigour, by giving them only a little Shelter in the Winter by means of a Frame of Timber, which could be taken to pieces at Pleasure. But now the worthy Gentleman Sir *Nicholas Carem*, who at present is the Possessor of that fine Seat, has exceedingly adorn'd these beautiful Trees, by building a new Conservatory for their Defence in Winter, which is so elegantly contrived, that tho' the Trees in themselves may be esteem'd one of the Wonders of our Country, their new Place of Shelter gives them so great a Lustre, that it seems as if the same curious Design which was begun by the Learned Predecessors of this Family, is still supported and maintained by their worthy Successor : And this is the more valuable, as it is remarkable, That few Great Families have the same Spirit kept up for Two Generations ; what is set up by the Father, is destroy'd by the Son ; what is bought by one, is sold by the other, &c. &c.

These

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These Orange-trees were the first that ever were known to be brought into *England*, and the first likewise that were set in the natural Ground; and from the extraordinary Produce of Fruit in these, I doubt not but that we have been encouraged to undertake the Culture of this Noble Tree, and have now made it to be so familiar with our *English* Soil and Climate: And we have likewise an Instance of the good Growth of the Lemon, and its bearing Fruit, even in the natural Ground, at a Gentleman's at *Petersham* near *Richmond*; But this, as I am told, has some little Shelter in the Winter to defend it from the severest Frosts. However, in *Devonshire* there are some Oranges which grow abroad without it.

I have, in some of my *Monthly-Observations*, taken Notice of the famous Orange-Trees at *Bedington*, soon after I was first surprized with their Beauty: But as to their Dimensions, I can now more particularly explain my-self, from the Account I have got from Mr. *Henry Day* the ingenious Gardener who now has the Management of them. “ The Orange-
“ Trees, says he, at Sir *Nicholas Carew's*
“ at *Bedington*, are Fourteen Foot high
“ from the naked Ground; for in these
“ there is not the Advantage of any Ad-
“ dition, such as a Pot, Tub, or Case

“ to be reckon’d in their Height : The
 “ Girt of the Stem is 29 Inches, and the
 “ Spreading of the Branches is 12 Foot
 “ one Way, and 9 Foot another, these
 “ are continually full of Fruit, which
 “ ripen perfectly, and are as compleatly
 “ adorn’d with Flowers.”

Among these Trees, is a Myrtle of the *Spanish* Broad-leav’d kind, which is above 18 Foot high, and spreads 45 Foot ; and if we joyn to this, the Myrtles I have seen growing in *Devonshire* in the natural Ground, I cannot see Occasion for any great Use of Fire for these Sorts of Plants, as there is commonly used in our Green-houses ; but, indeed, when Plants are in Pots, they are much more subject to suffer by the Frost, than if they had the Possession of the free Ground ; and the more woody the Plants are, they are still the more hardy.

I believe, I may venture to say, That Plants, which are Natives of the hotter Climates, will thrive much better with us, if they come to us in grown Plants, than if they were to be brought in the Seed. Among other Things, I would desire, that the Rivers, Bogs or Lakes, in the several Foreign Parts, be examined, and that, without Scruple, any Herb or Plant growing therein, if it has Seed which is ripe or near ripe, may have

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have the Seed gather'd, and put into an earthen Vessel, with Water and Earth.

N. B. Some of these ripen their Seed under Water : They might thus be brought to us, and if it is remarked, whether they grow in running or standing Water, we can easily propagate them with us. In these Sorts of Plants, any one may be sure to bring us something new, if he will take the Pains to gather the Seeds ; for, as yet, I do not know any, but myself, who has brought any new Water-plant to *England*, or has ever attempted it ; and some of them are very surprizing in their Manner of Growth. I could wish, likewise, that we could get some Plants or Seeds of Pepper to grow with us, and some of the true Rhubarb, if possible, for this last has not yet grown in *Europe*, as I could ever find ; though once, I remember, the late ingenious *Mr. Jacob Bobart* thought he had got it.

The *Hollanders*, who are certainly the most industrious People in the World, make it a great Part of their Business to collect Plants from all Parts of the World, in order to chuse out those which may be useful to them, either at Home or in some of their *West-Indian* Plantations, and the States there, give great Encouragement to such as do their best Endeavour in this Way ; for that Nation

finds its Advantage by so doing, as in one particular Instance is evident; and that is, In cultivating Coffee in *Surinam*, which, with great Difficulty, they first got from *Arabia Fælix* to *Batavia*, and thence to the *Cape*, so to *Amsterdam*, and then to *Surinam*, whither they first sent it in the Year 1714, and I now am inform'd, that the *Surinam* Plantation has already born a good Quantity of Coffee; but I think it would be much more the Interest of our Nation to encourage the Importing of strange Plants, than any other upon Earth, seeing the Happiness of our Soil and Situation, and the great Variety of Climates in which we have Plantations or Settlements abroad. I have already been the Occasion of planting several Millions of Ever-green Oaks in *England*, and have naturalized the Caper to our Climate, with several other Plants of Use; but the Plague raging about *Thoulon*, I have not been able to get Seeds over to make the Caper as common in *England*, as I design'd it; but I doubt not but in a few Years we might have Capers enow of our own Growth to serve the Nation; and tho' the Value of them may not perhaps be thought considerable, yet we are sure they will sufficiently pay the Rent of the Place, and every Little
which

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which is gain'd to a Nation, is an Advantage to it which should not be disregarded.

But I come now to my Third Proposition, which is, That when we gather Plants abroad, we should, if possible, learn the Names they are called by in the Country, and their Use or Virtues, and some Notice taken of their Soil and Situation, but especially the Climate; and, if it could be done, we should know the Humour of every Climate a Plant is brought from; that is, How long the Heats last, and when the Rains begin to fall and terminate; for by these Hints we may be sure of making every Plant Lasting and Valuable to us, which may be brought from any Part of the World. And for the Degree of Heat required to imitate every Climate, I have now so far proved it by several Experiments, that I have directed the making of Regulated Thermometers on Purpose for this Use, by that very ingenious Operator in Mathematical Instruments, Mr. *John Fowler*, at the Globe in *Swithin's-Alley* near the *Royal Exchange, London*, who is so justly admired by all that know him for his good Understanding of every Thing which falls in the Way of his Profession.

As for the Birds mention'd by my Correspondent, which might be brought from

other Countries to be made familiar with us, it is certainly to be done, and will succeed very well; for we have had many Instances of Fowls both of the Land and Water, which have done very well with us; as for Example, Those collected by Admiral *Churchill*, the Earl of *Portland*, the Duke of *Ormonde*, Mr. *Dubois*, and some private Gentlemen of my Acquaintance, where even the Birds and Fowls of the hottest Climes, seem'd to rejoice as much in our open Air, as if they had been at Home, even so far as to lay their Eggs, and breed with us as well as any of our domestick Fowls. At the Duke of *Portland's* especially, there were Parrots, which for several Years, and, as I am inform'd, are at this Day, flying wild in his Woods; but I do not hear that they yet breed, though, I think, I could find a Means to bring them to it. Canary-birds are bred here without Difficulty, if we give them Shelter, and I am inform'd by a Person of Honour, That he had two Paroquets had young ones hatch'd at his House. Indeed, the two latter are generally kept in Houses, and therefore, having more Warmth, may be excited to breed; but I am perswaded we might bring them to breed in the open Air, by a Method which I have experienc'd among some foreign Fowls with

Success,

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Success, and after a little more Knowledge in it, design to communicate: Nor need we despair even of preserving and continuing with us those Birds and Fowls which are Birds of Passage, such as Woodcocks, Quails, Nightingales, and even Storks themselves; for we have had many Instances, that Woodcocks have bred in *England*, and that Quails have lived with us the Year about, and Nightingales have been kept with us for several Years; and I remember a Stork that has tarry'd one whole Winter in Health with us. It has been supposed by some, that this last Bird retires to the Moon in the Winter, or, with more Probability, as far as *China* or its Confines: But wherever Nature directs these to go when they have their natural Liberty, yet we find, that when they are restrain'd by Accident from leaving us at the Seasons of Passage, they can subsist with us for several Years; so that 'tis possible to tame them, and keep them with us constantly, as well as other Fowls; or else, if we were to have them young, and at once allow them the Freedom of our Fenny Countries, I suppose they would be as constant to us as they are to other Countries. I am persuaded, that the Isle of *Ely* and Fens in *Lincolnshire*, would furnish them sufficiently with Food, such as Frogs and Fish, &c. to intice them

to

to use those Places every Summer, notwithstanding the old ridiculous Notion, that they will not breed in any Government but a Common-Wealth ; 'Tis their Food and right Treatment which engages them and all other Birds and Fowls to any Place. And so, therefore, if we have a Mind to have a Rookery, we may, I suppose, easily compass it by Breeding up a good Number of young Rooks tame, and letting them loose a little before Breeding-time, where there are high Trees. And Nightingales also, may be bred tame, and turn'd out where there are Bushes ; and I have been told, they have bred every Year in the same Place, by such Means. We have also Instances enough of Foreign Beasts, which have been naturalized to our Climate. But, indeed, there is no Occasion for any of them to come among us, but such as are Beasts of Burden, or are proper for Food : The Camel and Dromedary, I think, would be of Service to us, for carrying Burdens, and their Swiftness. So, likewise, I have known, that Fish has been brought hither from the *East-Indies*, and has lived several Years ; and at this Day, Mr. *John Warner*, a curious Gentleman at *Rotherhith*, has some Sorts of Fish in his Ponds which he brought from *Germany*. So that, in a Word, I am of Opinion, that there is not any Beast, Bird, Fish, or
Plant,

Plant, which may not be brought to live with us, and many of them to be so naturaliz'd to our Climate, as to breed and prosper with us only, by being a little taken Care of in their Food. But we must observe, That when we introduce either Animal or Vegetable, we must imitate, as much as possible, the Mode of their Life in their own Country; for this must be preserved equally, whether we have a Quadrupede, a Bird, a Fish, a Vegetable, or even an Insect, if we propose Success in our Undertakings.

I have yet to consider one Part of this Letter, which relates to a very Capital Point in Vegetation; *i. e.* The Way which Nature takes to help the Growth of Plants, and preserve their Life, besides what Nourishment they get from the Earth through their Roots.

My curious Correspondent observes, That in some of the hotter Climates, the Earth is without Rain for Six or Seven Months together, and is so much parched and dryed every Summer Season, that there is hardly any Moisture to be found in it for three or four Foot deep, and the Heats are so excessive during that Time, that without the refreshing Dews of the Nights, (which are very considerable) the Plants must inevitably perish; for they can have no Moisture but what
they

they receive from the Dews; and that Moisture, he tells me, supports the Trees and Plants in a flourishing State: for the Leaves, by the excessive Heat of the Sun, contract themselves towards the End of the Day, but expand themselves, and become more explain'd by the falling Dews of the Nights; so that they possess a most agreeable Verdure in the Mornings and first Parts of the Day: From this Moisture, likewise, of the Dews, the same Plants receive Nourishment enough to bring Fruit to Perfection. Thus is the Case of Plants in hot Countries, as my Correspondent intimates in his Letter; and, as he well observes, helps very much to explain the Motion of the Sap, or, in other Terms, its Circulation; for by these Dews feeding the Leaves in the Nights, the whole Plant is nourish'd so as to support itself against the extreme Heats of the Day.

The Fact alone may be disputed by such People as have not been led beyond the Limits of their own Country; or, at least, have not had some Experience in the Culture of Exotick Plants; In the latter, which is next our View, we find, that when we confine a Plant from the Air in a common Conservatory, by keeping the Windows and Doors close shut for a few Days, the Leaves of that Plant will
turn

turn Yellow, or of a pale Colour, which is a certain Token of Sicknefs; and if then we continue to confine it without the Freedom of fresh Air, we must give it over for lost; this is certain, Experience furnishes us with Examples of it every Day. We may then be assured, 'tis not the Nourishment drawn by Roots alone which supports a Plant; but the Air must likewise contribute: there is a Moisture in the open or fresh Air which is imbibed by the Spongy Parts in a Plant, that communicates itself to its principal Parts, and helps to nourish the Vessels through which the common Juices move in their Circulation, as it is in the Case of an Animal Body, which being confin'd from free Air, cannot be Healthful.

We have a remarkable Instance of the great Helps which Plants receive from the Air, in the several Sorts of *Sedums* and some *Aloes*, which being taken in Branches and Slips, and hung up in some Room where the Air has a free Passage, those Branches and Slips will remain Firm and Green for many Years; and moreover, when the Air is tending to Moisture, these Branches and Slips will put forth Roots, which sometimes shoot to a very great Length and Thickness; but at the Approach of dry Weather, or if they are debarr'd from free Air, they shrink and dry up. This springing of Roots from the

Parts of Plants which never had any Roots before, denotes, that there is every Property in the Air which is necessary for the Growth of Plants, though not for the Nourishment of Plants; for the Roots are thus made by frequent Changes of Weather. We find the Plants do not enlarge themselves, but decrease gradually in their Substance: 'Tis then, the Air which chiefly contributes to explain and unfold the several Parts of Plants, and the Earth only contains such Juices as are necessary to feed and nourish these Parts which the Air contributes to bring forth. But what I have already said in some of my former Treatises concerning the *Anatomy of Plants*, will give us a better Light into this curious Scene of Nature, and will plainly shew us, That all the Parts of a Plant are so interwoven one with the other, that not any one Part of the Body can be affected, but all the rest must share with it; which cannot be accounted for without allowing, that there is a Circulation of Juices in Plants, and that the Air is absolutely necessary to assist in that Operation, by preserving the several Parts in a way of Action.

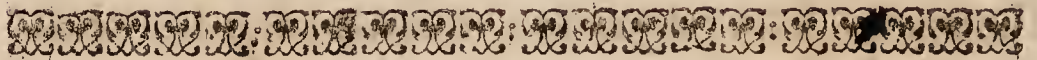
Another Instance to prove the Necessity of Air to support Plants is, That when Plants, such as Orange-Trees and some others, have been a long Time without Earth, such as their Case is when they
are

are in their Passage from *Genoa* to us, we find no Remedy so good to bring their Vessels to a right Tone, or to prepare them for Action, as to lay them, for a few Days, upon a Piece of Ground in a Shady Place. The *Effluvia* rising from such Ground, moistening the Air, reforms the Vessels, which at first laying down were shrunk, and dispose them for the Reception of the Juices of the Earth. Whenever those Plants are set into it, they will then grow liberally; but if they were to be immediately planted from the Chests they were brought in, without Preparation of this Kind, their Growth would be hazardous: Which is all I shall say at this Time relating to the Letter.

By way of Conclusion, I am to acquaint my Reader, that the Fine Piece of *Mosaick* Work, or *Roman* Pavement, found at *Woodchester* in *Gloucester-shire*, by my worthy Friend *Edmond Browne*, Esq; is not yet quite perfected: But as he informs me, that I may soon expect that Favour from him, I chuse to decline the publishing of that Part of it, which I delineated some time ago, and design'd for these Papers; supposing the Whole together will be much more acceptable to my Readers.

The Gentlemen who have any Thing new and instructive to communicate, are desired to send their Letters directed for me at *Mr. Fowler's*, *Mathematical Instru-*

ment Maker, at the *Globe* in *Swithin's Alley*, near the *Royal-Exchange*, *Cornhill*; And any one who is desirous of my Advice, may readily command it.



To Mr. BRADLEY.

S I R,

According to your Desire, I send you an Account of what extraordinary Flowers blow in my Garden in June and July. I am,

Your humble Servant,

T. FAIRCHILD.

Flowers for the Month of JUNE.

Great Apocinum of *Virginia*; White Wall-Flowers, and several other uncommon Kinds; the *Turkey* and Sweet Scabious, various Kinds; Ash-colour & White-Flower'd-Tree Scabious; several Kinds of Fox-Gloves; Mules Two Sorts; Candy-Tuft-Tree; Sweet Williams; All the Sorts of Lillies of the Valley, Sweet Lilly Asphodils, Day-Lilly, The *Roman* and Flaming Lilly, The White Lilly striped with Scarlet; Sedums several Sorts; great Variety of Daisies; Fine Ranunculas; Double-Creeping Crow-Foot; Sea-Daffodil; various Kinds of Columbines; Ladies Mantle; Tree Spurge; Onion-

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Onion-leav'd Asphodil ; Aloe-leav'd Asphodil ; Rosemary-leav'd Buck-Thorn ; Geraniums several Sorts ; Palma Christi ; Scorpion Senna, and Bladder Senna ; Convolvulus ; Scrophularia ; Blue-flower'd Genista ; Holy-oaks ; some Carnations ; Oranges and Lemons ; Roses ; Four Sorts of Corn Flags ; Small White-flower'd Female Cystus, and Large Gum Cystus, Dwarf Yellow-flower'd Cystus ; Globe-flower'd Rockets, Double and Single ; White and Purple Iris ; Ten Sorts of Flag Iris, Collection of Boulbous Iris ; Peach leav'd Bell-Flower ; White and Blue *Canterbury* Bells ; Dwarf Bell-flower'd-Tree ; Milkwort ; Nettle-leav'd Jessamine ; Valerian White and Red, *Greek* Valerian ; White and Blue Sea Pink ; Yellow Moly, Sweet scented Moly, Indian Serpents, and *Homer's* Moly ; several Sorts of Heart's-Ease ; great Blue-Bottle, Savoy and Tradescants Spiderworts ; Fraxinella White and Red ; Blue Monks-Hood ; Blue-Feather'd Hyacinth ; Double White and Red Batchelors Buttons ; Germander, and Germander-leav'd Chickweed ; *Italian* Honyfuckle ; *French* Honyfuckles ; *Virginian* Astragalus ; Syringa ; *French* Willow ; *Turkey* Lichness, Tree Lichness ; Early White and Red Honyfuckles ; Tree Cinquefoil ; Dwarf Broom ; Moon-trefoil ; Lotus Tree ; *Spanish* Broom ; Yellow, White and Red Yarrow ; Pomegranates ;

granates ; Yellow, White, Common and Imperial Martagons ; Double White Mountain Ranunculus ; Calamint ; Goats Rue White and Blue ; Double and Single Scarlet Lichness ; Larks Spurs ; Horned Poppies, Ever-Living, Black, and other Poppies ; Sweet and Everlasting Pease ; White Jessamine ; Yellow *Indian* and *Spanish* Single and Double Jessamine, Yellow and *Virginia* Jessamine ; Mastick-Tree ; Three Sorts of Thrift ; *French* Sage ; Single and Double Virgins Bower ; *French* Bean-Tree ; Spirea Frutex, and Currant-leav'd Spirea ; Double and Single feather'd Champion ; Two Sorts of Ornithogalum ; Golden Rod ; Sir *George Wheeler's* Tutson ; Mountain Scabious ; *Deptford* Pink ; Two Sorts of Limoniums ; Dwarf Mountain - Milkwort ; several Sorts of Ficoides ; Four Sorts of Tongue-leav'd Aloes ; Lichnoides ; *Virginian* Purple Sun Flower ; Fennel Flower ; Double and Single White and Blue Throatworts.

Flowers for the Month of JULY.

ORanges and Lemons ; Annual Stocks ; Ash-colour and White Tree Scabious, Sweet-scented and Mountain Scabious ; Collection of Carnations ; Two Sorts of Mules ; Sweet Williams ; Roman, Orange and Day-Lilly ; Sedums
seve-

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several Sorts; Rosemary-leav'd Buck-Thorn; several Sorts of Roses; Peach-leav'd Bell Flower Two Sorts, and Dwarf and Steeple Bell Flowers; Double Creeping Crowfoot; Valerian White and Red, *Greek* Valerian White and Blue; Four Sorts of Hearts Ease; Great Blue Bottle; Tradescants Spiderwort; Double White and Red Batchelors Buttons; *Virginian* Astragalus; *French* Honyfuckles; *French* Willow; Annual Lichness, Tree Lichness, Double and Single Scarlet Lichness; Lichnoides; Lisy machia; Tree Milkwort, small Mountain Milkwort; Dutch, Late, Red, and Ever-Green Honyfuckle; Tree Cinquefoil; Yellow and Red Yerrow; *Spanish* Broom White and Yellow; White, Imperial, Scarlet and *Virginian* Martagon; Calaminth; Three Sorts of Lavander; White and Blue Goats-Rue; Horned, Ever-living, Black and Common Poppies; Sweet Pease Scarlet and Common; Yellow, White, Blue and Scarlet Lupines; Colutea of *Aethiopia* and *Canada*; White Jessamine; *Virginian* Yellow, Common Yellow, *Spanish* Double and Single Jessamine; Common Spirea, and Currant-leav'd Spirea; Feather'd Champion, Double and Single Rose Champion; Double and Single Virgins Bower; Everlasting Pease; Starworts; Golden Rod of several Sorts; Spiked Speedwell; Two Sorts of Limoniums; Ficoides
several

several Sorts; Winter Cherry; White flower'd Nightshade-Tree; Capficums; Love Apples; *French* Bean-Tree; Myrtles; *African* and *French* Marigolds; Amaranthus and Balsamines; Four Sorts of Sun-Flowers; White Helebore, with a Black Flower; Oliander-leav'd Tree Apocinum; Four Sorts of Gnaphaliums; Four Sorts of Olianders; Scarlet and Blue Cardinal Flowers; White and Yellow Mullen; Red and White Orpin, and the small Ever-Green Sort; Fritilaria Crassa, small and great; Two Sorts of Passion Flowers.

N. B. Subscriptions for the *Family-Dictionary* are taken in at Mr. Daniel Midwinter's, Bookseller, at the *Three Crowns* in *St. Paul's Church-Yard, London.*

END of the Months of June and July.



A GENERAL
T R E A T I S E
O F

Husbandry and Gardening.

CONTAINING

Such Observations and Experiments
as are New and Useful for the Im-
provement of Land.

W I T H

An Account of such extraordinary In-
ventions, and natural Productions, as may
help the Ingenious in their Studies, and pro-
mote universal Learning.

With Variety of curious CUTTS.

*For the Months of AUGUST and SEPTEMBER,
And the remaining Part of the Second Year.*

By RICHARD BRADLEY,
Fellow of the Royal Society.

L O N D O N:

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AUGUST 1874

TREASURY

OF

AGRICULTURE AND GARDENING

CONTAINING

THE OBSERVATIONS AND EXPERIMENTS
OF THE NEW YORK DEPARTMENT OF
AGRICULTURE AND GARDENING

1874

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BY ALLEN A. K. R. ALLEN,

Editor of the Department.

NEW YORK:

Published by the Department of
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New York, 1874.



To the Right Honourable the

Earl of BURLINGTON.

My LORD,



O observe the Elegancy of Stile in Your Lordship's Palaces and Gardens, gives us such an Example of Your distinguishing Genius, that at the same Time I am naturally led to Complement Your Lordship upon the Happiness of Your Taste, and congratulate my Country upon the Improvements which must necessarily accrue to it, from the Opportunity we have of admiring Your Lordship's Works.

'Tis from such excellent Examples as Your Lordship has given us, that we may hope to see both our Buildings and Gardens brought to the highest Pitch of Perfection; and there-
by

The DEDICATION.

by render the British Nation the Admiration of Foreigners.

This Papers which I here lay before Your Lordship, are calculated for the Use and Entertainment of my Country : And as they consist of such Designs as are new and practicable for the Improvement of Gardens ; I have the more Reason to hope they will be favourably receiv'd into Your Lordship's Protection, which is the highest Ambition of,

May it please Your Lordship,

Your Lordship's most

Obedient humble Servant.

Richard Bradley.



EXPERIMENTS, &c.

I N

Husbandry and Gardening.

First, Concerning the Order of Nature, and the Use of that Knowledge in the propagating and cultivating of Plants; with Remarks upon the Disposition of Gardens in general.



As I design this shall conclude my Monthly Writings, so I think it necessary to give my Reader a Word or two particularly concerning them.

When I first set out in this Way of Writing, I had two Views, the first was, to instruct the Operators in Husbandry and Gard'ning in the Rational
 B Part

Part of these Arts, by bringing them acquainted with the Nature of Things, and how Bodies, or Parts of created Matter, had a Dependence upon one another: In order to which, I began to explain the Analogy that there is between Plants and Animals, that thereby we might the easier know how to enter into that untrodden Path of the Vegetative Life, or how Vegetation is perform'd; which naturally led me to consider the Anatomy of Plants, and which at length brought me to broach that New Doctrine, that the Sap of Plants circulates as truly as the Blood does in Animal Bodies, which I have in these Works confirm'd beyond Contradiction, by many convincing Experiments. At the same Time when I consider'd the State of Plants to be so far analogous to that of Animals, I was as naturally led to think that Plants had a Mode of generating, in order to continue their several Species to the World; and this last after much Labour I think I have as clearly demonstrated, as it is plain that a Plant is subject to the Laws of Nature.

Secondly, I endeavour'd, as much as in me lay, to render the Business of Husbandry and Gardning easy and intelligible to all Lovers of those Studies; and that they might take the greater Delight in those Works, I have spar'd no Pains to make those Diversions useful and profitable;

ble ; and I flatter my self that the Design of my Writing has had that good Effect, as to encourage the making many very considerable Plantations, which otherwise would not have been thought of, and so far I hope I may be said to have done some Good to the Publick : And I hope the Method which I have propos'd for storing a Garden at once with bearing Fruit-Trees, will afford some Pleasure as well as Profit to those Gentlemen who do not think of planting their Gardens 'till they have Occasion to retire to them, and use them, and so are generally forced to wait four or five Years for Fruit ; but the Way I propose, will immediately furnish them.

But give me leave to speak a little more fully to my first Design, *i. e.* of the rational Part of Gard'ning, and how necessary it is to consult Nature in other Things as well as Vegetables. If we would truly understand the Nature of Plants, for to judge of a Plant only by the Outside, will only inform us that it has Roots, Wood, Bark, Pith, Buds, Leaves, Flowers, and Fruit ; but for what Use these several Parts are design'd by Nature, can only be found out by examining other natural Bodies, and consulting how far one is analogous to the other ; and so by Comparison be brought to such Judgment as leads us to Experiments, and those Experiments

B 2

declare

declare how far we are right or wrong in our Judgment. We should know also how far every Element is concern'd in the Welfare of a Plant ; and when we have gone so far, we are next to think of the Parts of a Plant, and how far they each of them agree with the Parts in Animals, which we know the Use of ; and then, when we have discover'd how far the Parts of one and the other are agreeable, we are naturally brought to the Discovery of their Uses, *viz.* what Parts are appointed to receive the Nourishment, such as the Roots, which do the Office of the Mouths in Animals ; the Vessels or Channels which convey the Juices thro'out the Body, as the Arteries and Veins in Animals ; and such Parts as are made for the Secretion of the Juices, like the secretory Ducts in Animals, &c. but then say some, tho' there is a Circulation of Juices in Animals, that is set on Foot by the Motion of the Heart, yet there is no such Pump as the Heart in Plants, and therefore there can be no Circulation of Juices : Well then, there are Muscular Parts in Animals, but there are no such Parts in Plants, nor are the Nerves in Plants, nor Eyes, nor Ears. Let us then consider why Plants are agreeable to Animals in some Things, and not in all. In Answer to which, we must consider that Animals have local Motion, and Plants have

have not ; therefore all the Parts that are necessary to convey Animals only from Place to Place, would be unnecessary to Plants, which are doom'd by Nature to stand always in the same Place. Now, as Animals are sometimes in cold Places, and sometimes in hot, so the Heart is necessary to keep their Juices in Motion. The Muscular Parts and Tendons are necessary to give them Strength in their Motion, and their Nerves to give them the Sense of Feeling ; their Eyes to guide them on their Way, and their Ears as well to forewarn them of approaching Danger, as to receive the Word of Command from their Masters ; but every one will certainly allow that a Plant can have no Occasion for these Parts, for the Reason given before : The Motion of the Juices in a Plant is carry'd on by other Powers, such as Rarification and Condensation of the Air, as in some of my Works I have shewn, and this particularly depends upon the Knowledge of the four Elements, and their Powers.

In this Place I cannot help taking Notice of the extraordinary Wisdom of the Creator, and how much his Omniscience is to be admir'd in the Contrivance of the Six Days Work, as *Moses* has deliver'd it to us. If we consider the Order that the several created Bodies were made in, we shall find, from the Knowledge we

have now of Things, that the several Bodies could not have subsisted if they had not been created in the very same Order that *Moses* has deliver'd to us; so great a Philosopher was *Moses*, (if he was not inspir'd) that I cannot find how his Account of the Creation can be mended, any more than contradicted. I shall beg my Readers Patience therefore, while we examine it, and reason a little upon it.

We are first to consider the *Chaos* out of which the World was made, as a confused Heap of Matter, without Form, being nothing but a deep miry Abyss, cover'd with Waters, and invellop'd in Darknes; however, this Mass, as confused as it was, contain'd a vast Capability of Things, which only wanted to be determin'd and settled by an omniscient and omnipotent Power, by whose Wisdom, the several rich Qualities which lay hidden and confounded, with one another, were separated, proportion'd, and ranged in Order, as related in the Six Days Works.

The First Day, The Light was separated from the Darknes.

The Second Day, The Firmament was made, to separate the Waters from the Waters.

The

The Third Day, The Waters under the Firmament were gather'd together in one Place, and the dry Land appear'd; the Earth then brought forth Grass and Herb yielding Seed, and the Fruit-Tree yielding Fruit after his Kind, whose Seed was in it self.

The Fourth Day, The Sun and Moon were made to rule the Day and the Night, and to divide the one from the other, and for Signs, and for Seasons, and for Days, and for Years; and also in this Day's Work the Stars were made.

The Fifth Day, The Fishes were created, to be Inhabitants of the Waters, and to increase and multiply abundantly there, and likewise every winged Fowl after his Kind, to multiply in the Earth.

The Sixth Day, Were made every Beast of the Earth after his Kind, and Cattle after their Kind, and every Thing that creepeth upon the Earth after his Kind, and last of all Man was created to have Dominion over the Fish of the Sea, and over the Fowl of the Air, and over every Thing that moveth upon the Face of the

Earth ; and God gave him likewise every Herb bearing Seed, and every Tree in the which is the Fruit of a Tree yielding Seed.

Thus the Heavens and Earth were finish'd, and all the Ornaments of them, as Trees, Flowers, Herbs, Sun, Moon, and Stars, Fishes, Fowl, Beasts of the Field, and every creeping Thing, and at last Mankind, the chief of all.

But let us now enquire how necessary it is that this Order, and no other, should be kept in the Creation of Things. Would it have been rational to have found the Beasts of the Field before the Grass of the Field, or the Fowls of the Air before the Herb with its Seed, or before there were Fish, which is the chief Food of some Fowls, and even of some Quadrupeds ? or could there be Herb or Grass without the Land had been separated from the Waters ? or could there be Fish without the Waters had been distinguish'd from the Land ? or could the Plants have subsisted unless the Waters had been separated from the Waters, one Part to be above the Firmament, to fall in due Time in refreshing Showers for the Nourishment of Plants ? or could any of these have subsisted without a Body of Air made separate from the other Elements ? as such was the Firmament, which kept the Waters which composed

composed the Clouds, from falling all at once upon the Earth. And besides, What Possibility could there be of any living Creature's finding its Food in solemn Darkness, or even of moving from Place to Place, without Hazard or Despair? or when they had seen the Necessaries for the Maintenance of their Life, how should they know how and when to shift their Quarters in search of their Food, without the Distinction of Seasons, which are regulated by the Course of the Sun and Moon, whose Influence we find governs the Flights of Birds, as the Stork, the Woodcock, &c. from one Country to another, as sure as the appointed Season is felt by them. Nor are the Fish less sensible of the Times when they are to have their Rendezvous at certain Places, as we observe in the Passage of Mackarel, Herrings, &c. and Plants likewise, of several Kinds, are so directed by these great Powers, that we find them earlier or later in their Appearance, according as the Sun influences them more or less. But if it be objected, that Plants must of Necessity have the Appearance of the Sun to preserve them, Experience will prove the contrary; for Plants of any particular Climate, will live in the same Climate without the Presence of the Sun. Nor can I think, as some do, that Animals were not originally made to prey upon one another; for if that had not been the first

first Design : If the World had remain'd in a State of Innocence, the Increase of Animals would have been so great and numerous, that the Earth and Waters could not have contain'd them ; nor does the Wisdom of the Creator appear less in the appointing the vast Variety of Herbs and Plants upon the Earth, distinctly different in their Figures, and in their Natures ; for as he ordain'd so great a Variety of Fish, Fowls, Beasts, and Insects, or creeping Things of different Forms, and different Natures ; 'tis as necessary to suppose their several Foods should likewise be of different Natures from one another ; nay, it is apparently true from Observation, in such as diet upon Plants only ; the Goat will eat Herbs which are poisonous to other Creatures, as well as others will eat those which are disagreeable to the Goat ; the Green-Bird will eat the Seeds of the Mezerion, which would poison a Man, was he to eat half so many as one of those Birds will do at one Time. The different Forms of Plants were likewise necessary, that every Animal might rightly distinguish its proper Food from the rest : And every Insect too was no less regarded in the Creation ; for as all Insects feed upon Plants, it is necessary likewise that the Figures of Plants should be different from one another, to be distinguish'd by them ; and so the Insects too, were necessarily
distin-

distinguish'd from one another, as they were to serve as Food for young Birds, being tender and easy of Digestion, before their Crops or Maws are capable of digesting Grain or Seed; but when the Birds were created perfect, they had no need of these Insects to feed upon; so that the Creation of Insects was not necessary till the last Day's Work, which we suppose was before there were Increase of Birds to require them for Food. Nor do I think the Waters are less productive of Varieties of Plants than the Land: What numerous Diversities may we observe even upon the Sea Shores; and what Plants of curious Figures do we meet with in Rivers and Lakes, which serve for the Food and Shelter of Fish; and as Plants were the only created Bodies that are wanting of local Motion, how wise is the Design of placing their Seed in themselves; for how else could they increase? For if we take a Survey of all the other created Works upon Earth, we find they are endow'd with local Motion, and that the coupling of the Male with the Female is necessary, in order to increase or multiply their Species; but these can follow one another from Place to Place, the Male to find out the Female, or the Female to discover the Male; but Plants are fix'd and confin'd; therefore, unless they had in themselves the Male and Female Powers, we could
not

not expect their Continuance; and it is likely that from this Passage in *Moses* writings, came the first Thought of Plants having a Power of generating, tho' it was not understood by what Means, nor was the Explanation of it attempted by any that I know of, 'till I first made Experiments upon it in *Holland*, which when I found to answer my Expectation, serv'd very much to improve the Discovery of the Sap's Motion. But as Plants are made of different Forms, and have different Virtues, as well as Animals and Insects differ from one another; how necessary is it that they should be made Inhabitants of different Climates; therefore, with what Wisdom was the Sun's Course directed as it is at present, to regulate the Climates to the Service of all the several Kinds; but there is no End of admiring the Beauty and Order of this excellent Work, which is so wisely dispos'd, to contain every Thing necessary, and is so subject to Order, that no strictly new Species can be produc'd, or can any different Creatures whose Parts and Nature are near enough the same to couple with one another, bring forth a Body which shall have Power to increase or multiply.

Before I leave this Subject, I think it *apropos* enough to give my Reader a Word or two concerning Creation, as I find it in *Dr. More's Conjectura Cabalistica*. In the
 Philo-

Philosophick Cabala Chapter 2d, the Doctor reasons thus, That those Things which in his Literal Cabala he calls the Garnishing of the Heaven and the Earth, namely, the Sun, Moon, Stars, Animals, Vegetables, &c. in his Philosophical Construction, he says, They are not only so, but the Generations of them; he says, Plants and Animals were the Generations, Effects, and Productions of the Earth, the Seminal Forms and Souls of Animals, insinuating themselves into the prepared Matter thereof; and Suns, Planets, or Earths were the Generations or Productions of the Heavens, Vigour and Motion being imparted from the World of Life to the immense Body of the Universe. So that what he before, in his *Literal Cabala*, call'd mere Garnishings, he now says, are indeed the Productions or Generations of the Heavens and of the Earth. So soon as they were made, (he goes on) That he does not take upon him to define the Time wherein God made the Heavens and the Earth; for he might do it at once, by his absolute Omnipotency; or he might, when he had created all Substance, as well material as immaterial, let them act one upon the other, so, and in such Periods of Time, as the Nature of the Production of the Things themselves requir'd. Thus far the Doctor's Philosophical Reasoning how the Creation of Things was brought to pass: I shall

shall proceed to offer some Particulars relating to the designing and laying out of Gardens ; wherein I shall endeavour to shew, that the more agreeable to Nature our Gardens are made, so much more Beauty do they contain, and come nearer that elegant and polite Taste which at present is wanting in Gardens.

Now we have taken this short View of Nature and its Order, we may judge how shocking and detestable must every Thing be, that is contrary to it.; its Beauty is Freedom, and its Gaiety familiar ; and nothing can be agreeable to the Mind, that is not concordant with it. Those who make the designing and laying out of Gardens their Business, should chiefly consider this, and also inform themselves that Nature is full of Variety, and that it is the great Variety in Nature that captivates the Mind, and draws Admiration, and especially that the more Variety there is in a Garden, so much the more it resembles Nature, and of Consequence is the more beautiful and pleasing ; for good Judges will judge of Gardens as they do of Pictures, the more free and lively Expression is always prefer'd before the more stiff and formal. In the Disposition of a Garden, there should always be avoided the too stiff Regularity, as well as the too wild and extravagant ; an easy and familiar Distribution of Art and Nature, of Rule and Liberty,

berty, will always best recreate the Mind ; nor should the Proportion of the Works in a Garden be less consulted ; for they may be too much crouded, as well as too thinly dispers'd, and either of these is alike shocking to the Senses, and argues Want of Taste and Judgment in the Contriver ; so is it alike disagreeable, to see Works of the highest Grandeur, which ought only to appear in Gardens of the greatest Extent, attempted in a small Garden ; for tho' on a large Plan they may have a good Effect, when they are judiciously intermix'd with one another, yet take any one of them singly, and confine it to a small Ground, it will lose its Beauty. It is no less disagreeable to command the Prospect of a Garden all at once ; and that generally happens from the Love our Designers have for disposing of Gardens in regular Figures, and from their study'd Contrivance of making one Part uniform with the other ; and then 'tis no Matter what the Expence may be, but the Ground must be levell'd. Indeed, I cannot say but such a Regularity looks very well in a Draught ; but when it comes to be work'd, the Sight of it stupifies and dulls the Senses as bad as the constant Noise of a Mill, or turning round for half an Hour would do : And besides, this study'd Regularity has another bad Consequence, and that is, all Trees, however stately they be, that happen to
stand

stand upon the appointed Ground, must be taken away, to give Place to this solemn Stiffness. I should not be so very particular on this Head, if I could find a Garden without some Fault or other of this Kind, for then there would be an Example which might save me this Trouble: However, I am not to be understood that we have no Gardens in *England* that are agreeable, for we have many that have their Beauties as well as their Faults: But I mean, there is not one that carries the good Taste quite through; which perhaps may happen from the Designs of them being made by Men of different Genius: We shall in one Part see something of a becoming Grandeur, well dispos'd and adapted to the Extent and Design of the Place; and on the other Hand we observe something as mean and poor spirited, and disproportionable; narrow Walks of a Mile in Length, and wide Walks and Views of a hundred Feet in Length; and one Thing more is as frequently to be observ'd, and is no less improper, that is, in the disposing of Pots of curious Exoticks, when they are set abroad in the Summer Season; many of the Aloes, Fecoides, Sedums, &c. which never make large Plants, and whose Beauties will bear the nicest Examination, are often set on the Ground, by the Side of a Verge of Grass, or Gravel, perhaps ten or twenty Feet Distance from one another;

so

so that the Design of them is lost, and they make no Appearance worthy our Regard ; and this Disposition is probably one Reason, why those Curiosities are not more frequently propagated : For to what End is any Thing brought into a Garden, unless it is made agreeable to some of the Senses ; so Auriculas, Carnations, and other curious Pot Flowers, tho' they are never so fine in their Kind, may be distributed in a Garden with so little Judgment, as never to command the least Admiration ; but when they are set together on Benches or Stands, the Variety and Mixture of their Colours leads us to admire them, and they then make a good Part of the Ornament of a Garden ; if it be small, such Stands of Plants may very properly terminate the Walks.

It is likely that these Mistakes may proceed from four Things.

First, From the natural Genius of the Designer, which perhaps is low and mean, and not daring enough to study Grandeur ; or,

Secondly, From the Want of Opportunity of observing those Things, which are great and noble, both at Home and in other Countries ; or,

Thirdly, From the Want of conversing with Men of Taste and good Judgment ; or,

Fourthly,

Fourthly, From the Want of Conduct, to apply properly the several Materials he has got together. Neither do I think, that when he is possess'd of all these Necessaries, to make a good Designer, he can ever render his Draught upon Paper intelligible enough, to give us those Ideas, which we ought to have of a Garden before it is made; for tho' indeed it is true, that by shading of a Draught, one may in some Sort represent Hollows, Slopes, Terrasses, &c. so that the Workmen may understand how to work from it; yet the Gentleman for whom it is made, can never rightly frame an Idea from such a Draught, of what it will be, and how it will appear when it comes to be finish'd: Therefore in such a Case, I would always advise a Model to be made of every Garden, before it should be determin'd entirely, whether it should be made or not; for in a Model, we may observe the Risings and Sinkings of the Ground, the Terrasses, the Hedges, and every other Part as it will appear to the Eye; when it is made, we shall discover by fixing some Point at a little Distance from the Model, what Parts may be seen at one View; and then, by shifting the Point, discover other Objects which were not discover'd to us before; and so if by shifting our Points round about the Model, keeping the Eye always to the same
Height,

Height, we find new and entertaining Objects from every Point, then one may allow such a Design to be good ; and besides, as such a Model will be made by a Scale, and every Part of the Ground, as well as every Hedge, or Plant, or Urn, Statue, or Water Work, &c. will be of its intended Proportion ; so whatever offends the Eye in the Model, must necessarily offend in the Work itself ; but a Draught will not Discover either the Beauties or the Faults ; and really considering how cheap a Model might be made of a Garden, and how much Money it might save a Gentleman in Alterations ; besides, its Beauty which might render it as agreeable as a Picture in an House, after we had made the proper Use of it ; I wonder no Body has yet had Models of Gardens made ; if it is because it has not been yet thought on, or because it is not known where such Things can be made ; I shall inform my Reader, that I have instructed one in the Method of making them, and embellishing them in a proper Manner ; who may be heard off at Mr. *Fairchild's* at *Hoxton* : But especially the most beautiful Gardens, may be made where the Ground is the most irregular and uneven, where there are Hills and Pits ; these unlevel Spots dictate to Men of Taste those Varieties, which by discreet Management, will afford the greatest

Beauties in a Garden, and by no Means should be level'd, unless some Part near the House. Where such Ground as this is not met with, it is impossible to have any just Idea of the Beauties it may produce without a Model. What an extraordinary Effect has the Irregularity of the Ground in Mr. *Blathwait's* Gardens near the *Bath*; and how much has the Gravel-Pit been admir'd in *Kensington* Gardens, and so in every Place where the Hills and Hollows are order'd with Judgment, they always have an extraordinary Effect. In such Places, if there happens to be the Command of Water, and the Work is larger, it should be dispos'd *a la Rustica*; and upon the higher Parts which are most remote from the House, should be plac'd Obelisks; and if a Summer-House be requir'd, let the Foundation of it and ground Room be rustick Work, in Imitation of a Rock, and the Chamber above be built in the Manner of a *Grecian* Temple, which would have an extraordinary Effect: All this dispos'd in Wilderness or Bosquette-Work, which should have here and there some open Places, where some of the Fables of *Æsop*, may be represented by Beasts and Birds, as big as the Life cast in Lead, and painted of their natural Colours; and if there is Conveniency, let them play Water at one another; also where Water may be com-

manded,

manded, it may be us'd to give Motion to Figures, which will still contribute to entertain. This Bosquette-Work, should likewise be interplanted with all Sorts of wild Wood-Flowers, as Primroses, Cowslips, Harebells, &c. which will extreamly add to its Beauty. In short, whatever seems the most natural, or possesses more of natural Beauties, is the grand Taste; and whatever possesses, formal Regularity generally carries a Stiffness along with it, which is the Mechanical Taste. I own that the Thought of introducing in this Wilderness Work, some of the Fables of *Æsop*, which chiefly are represented by Birds and Beasts, I took from the *Versailles* Gardens, where even tho' the Ground is level, they have an extraordinary Effect; but in such a Ground as I have been speaking off, they will have a much better Appearance, as in its own Nature it is more rural: In such Places too the Thoughts are more given to Contemplation, and such Moral Pieces as the Fables of *Æsop*, may give us Opportunity of improving our Talent that Way, as the beautiful Appearance of natural Things, may lead us to admire the Wisdom of the Creator. A very ingenious Gentleman, whose Taste in these Matters, is much the best I have met with, gave me the Hint of placing Obelisks in such Gardens; for as he observes, good Statues

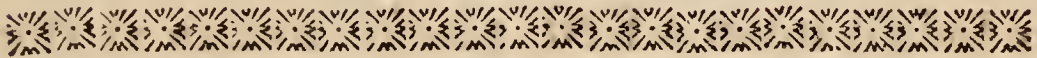
are hard to come by, and a single Statue here and there has so poor an Appearance, that we had better have none at all ; but as grand Gardens cannot be quite void of Ornaments of this Nature ; this Gentleman advises the erecting of Obelisks, which he would have dedicated to great Men, who have done Service to their Country, by fixing Inscriptions upon the Pedestals of each Obelisk ; and *en passant* I must take Notice too of a concurring Remark, which another curious Gentleman made upon this Design, when I told him of it ; that he thought, there should likewise be some Obelisks put up in Memory of such Persons, who had wrong'd or abus'd their Country ; but whether this be or be not put in Practice, it is sure, nothing can have a finer Effect in such Work as I have been speaking off, than these Obelisks.

But from this Grandeur of Design in Imitation of Nature, we must contrive to come nearer artful Regularity ; as we come nearer the House, and that must be done gradually, and not too suddenly, for too sudden Breaks from one Thing to another, are shocking, and especially when the Difference is so great, as between natural Freedom and formal Rule ; therefore when we leave the Wilderness we have been speaking off, we may terminate some of its Walks next the *Parterre* or *Area*, which should be always next the House, with

with Portico's, or Triumphal Arches in Lattice-Work, or as the French call it *Treillage* ; which Works being painted with a verdegri Green, and gilt in the principal Parts, have a very good Appearance. The Regularity of these Works, and the natural Order of the Forrest Plants, which shew themselves beyond them from the House, make a very agreeable Prospect. I had omitted to mention, that in the Disposition of our Bosquette we should choose some hollow Part to place our Orange-Trees in, so that the Walks or Places the Trees are to stand upon, may move gently downwards in the Manner of a Screw ; and especially taking Care to leave Walks about the whole, and above the Trees, so as to look down upon their Heads, for then we observe all their Beauties ; but this by the by ; let us return to that Part of the Garden, where we leave the grand Part to gain gently ; the *Parterre*, suppose at the same Distance from the House, where we place the Portico's of Lattice-Work ; over against the Middle of the House, we erect something with Yews or other Ever-greens, in the Form of an Amphitheatre, and place a Line of Statues upon Pedestals. If we can have them good to stand Parallel with the Line, on which the Portico's and Amphitheatre is plac'd. In the Bosom of the Amphitheatre, may now be a

regular Basson with a Jet; and within the Line of Statues towards the House, one may contrive a little Wilderness Work to be bound with low ever-green Hedges, and include only the smaller or most dwarf flowering Shrubs: This will make the Break from Nature to Art the more easy; till now next the House, we have a Piece of Ground more apparently regular and adorn'd with Ever-greens, Urns gilt, or otherwise, *China* Jars, and such like, which is the Beauty of the *Dutch* Gardens. The Regularity in this Part, if it is not crouded, is not amiss, because it joyns with a Building which ought to be regular; and besides, as the bounds of this Area or *Parterre*, should be no more than what may all lye under the Eye, from the grand Apartments of the House, it should have Symetry and Order in it; but especially, it should not be confin'd by any Walls, if possible, or at least, the Walls should be hidden by some Means or other. I should esteem it likewise, one of the greatest Faults, to fence in the grander Part of the Work with high Walls; for all Occasion should be taken, to make such Works appear without End; of which, the Gardens of *Versailles* are a very fine Example: But tho' it is impossible, that any one less than a Prime Monarch, could ever be Master of so great and noble a Design as *Versailles*;

Sailles; yet from thence, a Man of true Taste, may extreamly improve his Genius, and render many of its Beauties conformable to smaller Designs, as well as it would quite confound and destroy one of no Taste, or of an indifferent Genius. As for fine Fruit, it is by no Means proper in such a Garden as I speak off; that should always have its Station in the Kitchen Garden; nor would I have my Reader after perusing the Conjectures above, believe that there is not a Possibility of making an elegant Garden, under an hundred Acres, for the grand Gouft, may be as well shewn in a single Acre, as in a thousand; as sure as the Gentleman will always shine, let his Circumstances be never so narrow.



Description of a Mill for making Cyder, with twelve Bushels of Apples to each Hogshead. Invented by Edmond Browne of Rodborough, Esq; in Gloucestershire; and now in Practice among the Inhabitants of that Part of the County.

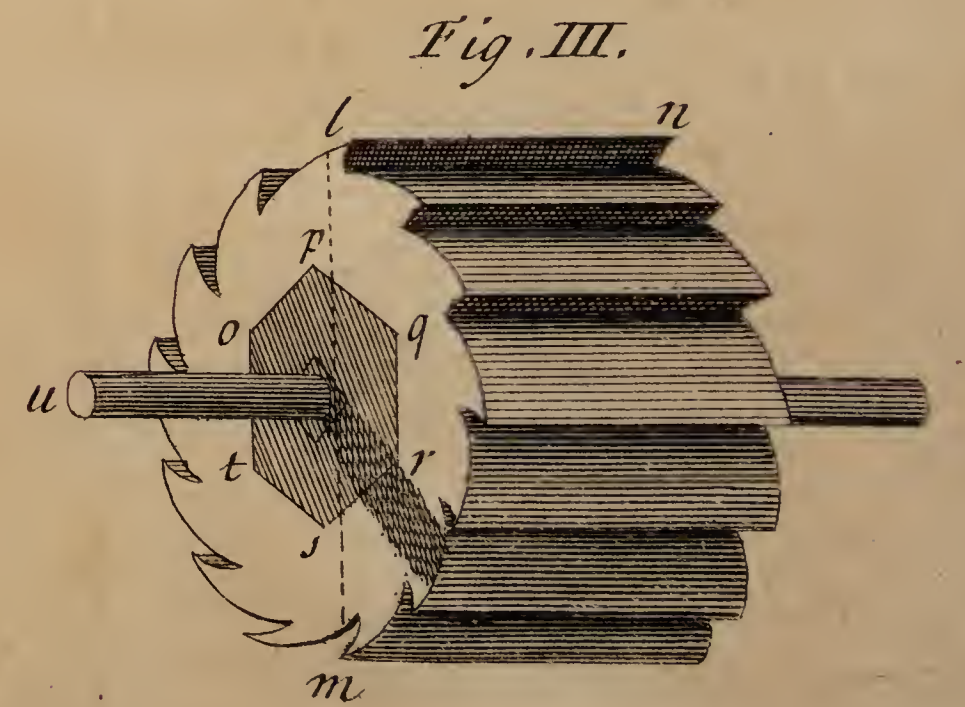
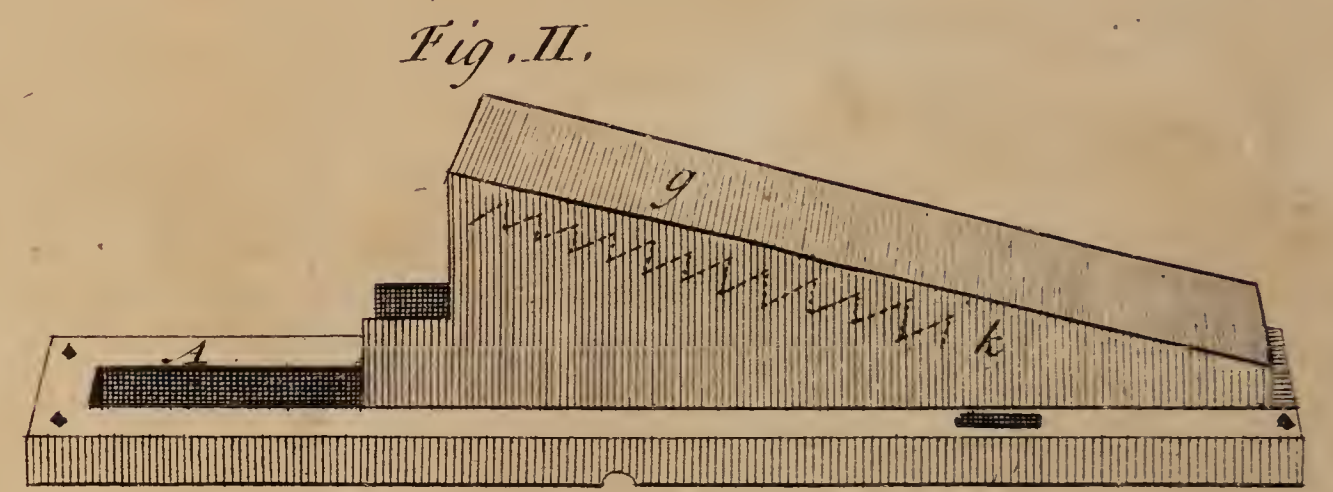
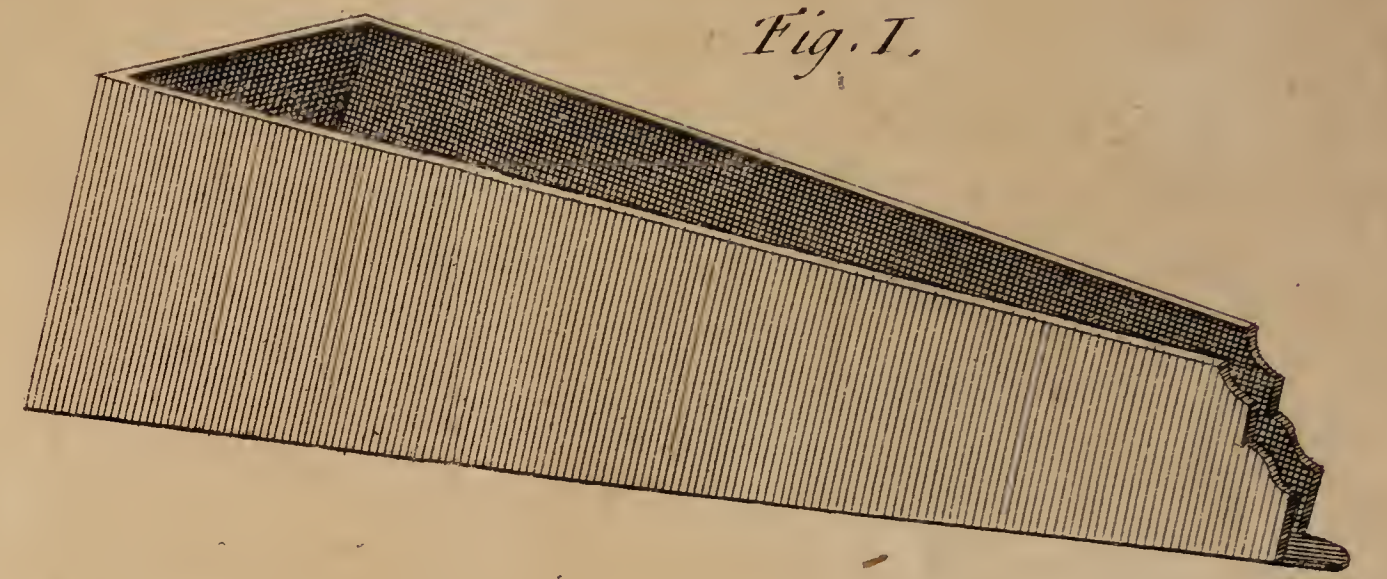
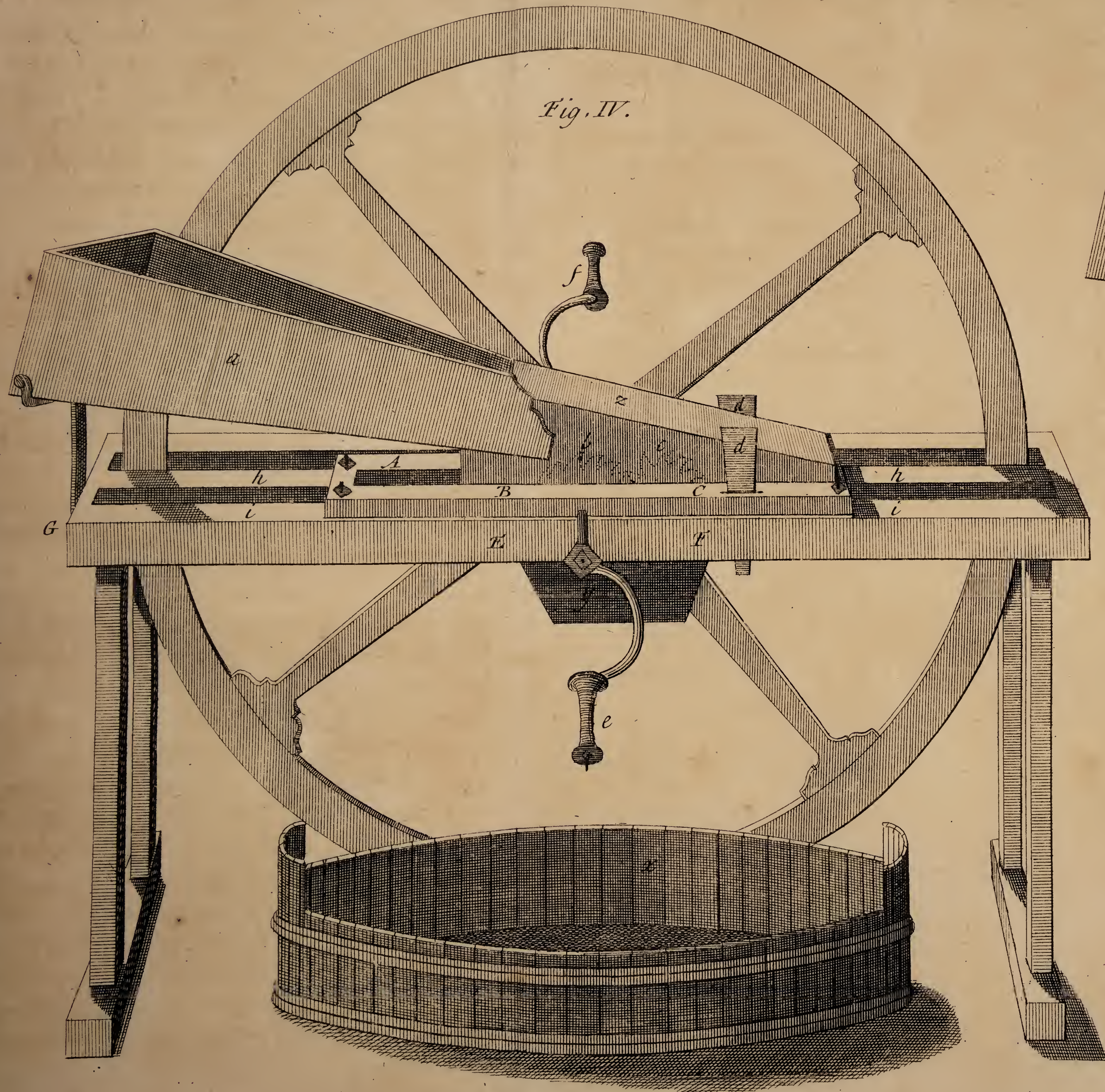
I Need say very little in Commendation of the above-mention'd curious Gentleman's Invention, for making an Hogshead of Cyder with twelve Bushels of Apples,

since it is so well known, that the Common Allowance of Apples for an Hog-head, is twenty, and sometimes two and twenty Bushels; so that by this Method, there is at least, one third Part gain'd upon all the Cyder - Ground in *England*; which vast Improvement, very justly demands the Thanks of every true Lover of his Country, to the worthy Inventor.

Explanation of the Mill for Grinding Apples.

Fig. I. Represents the Binn or Trough whereinto the Apples are pour'd, in Order to their being tumbl'd down between the Rollers to be ground. This Binn is furnish'd with a Tongue *a* that enters into the Box. *Fig. II.* The better to guide the Apples to the Rollers, and the Tongue is lodg'd upon a Rest, plac'd within at the Mouth of the Box, in such a Manner, as that the End of it may hang directly over the Top of the Roller *b*, *Fig. IV.* but so as not to touch it; the Person that grinds at the Handle *e* of the Mill, *Fig. IV.* is with his left Hand to feed the Mill, and govern the Apples that they may tumble into the Rollers, in a just Proportion and not choak.

Fig. II. Is a Box to be fast'ned down (by its Frame *A*) with Screws or Keys upon the Pieces *b* and *i* of the Mill, *Fig. IV.*





to protect the Rollers, and confine the Apples. The Top Board of this Box *g*, is to be furnish'd on the Inside with Teeth or Furroughs, represented by the prick'd Indentings *k k*. The Use of these Furroughs, is to crush a larger siz'd Apple (at its Entrance) against the Roller *b*, *Fig. IV.* that it may not refuse to be taken in between the Rollers *b* and *c*. This Top Board should therefore be elevated, to such an Angle with the Frame of the Box, as that it may be at a proper Heighth from the Roller *b*; and also so near to the Roller *c*, as just not to touch it; thereby to prevent any Parts of the Apples, from getting over and beyond the Roller *c*.

Fig. III. Represents a Roller drawn to a larger Scale, (with 13 Teeth) the Diameter *l m* is 7 Inches, the Thickness *l n* 4 Inches $\frac{1}{2}$. The whole being of cast Brass or Bell-Metal, except a Cavity thro' it, represented by the hexagonal Figure *o, p, q, r, s, t*. and which is fill'd up with Wood, wherein the Iron Axis *u u* is plac'd. The angular Figure of this Wood, prevents its loosening or turning round within the Metal.

Fig. IV. Is the Mill join'd in all its Parts; wherein *a* is the Binn, supported behind by a Rest *w*; *z* is the Box screw'd on by its Frame *A*, to the Pieces *b* and *i*: If you suppose the Side of this Box transparent, the
Rollers

Rollers *b* and *c*, which are of equal Bigness, and represented by dotted Lines, will be seen thro' it. The Roller *b*, turn'd by the main Axis whereon the Wheel hangs, drives the Roller *c*, which runs in Brass Collars, lodg'd in little Blocks of Wood, moveable to and fro, in hollow Mortices or Channels made on Purpose in the Pieces *b* and *i*. The Design of placing this Roller on these moveable Blocks, is to give it Liberty to recede more or less, as there is Occation, from the Roller *b*. The Quantity of this Recess is adjusted by the Wedges *d d*, which pass thro' Mortices made for them, and whose Sides are contiguous to the Ends of these Blocks. Whilst the Apples are whole we give the Rollers the more Liberty, by raising these Wedges; but when we grind 'em over again the second Time, after the first pressing, we confine the Rollers more, by forcing the Wedges down. The Rollers are to be plac'd, as that, when they have the most Liberty, they may but just run free between the Pieces *b* and *i*, and the Sides of the Frame of the Box, and two cross Bits of Wood lodg'd and fast'ned in the Inside of the same Frame, about the Place *B* and *C*, to the Intent that no big Pieces of Apple may drop through unground. *T* represents a hollow Conveyance, or Mouth, plac'd under the Rollers, to deliver the ground Apples into the Receiver or Tub *x*; the Handle *f*, at which a second

cond Person turns, is placed so as to be elevated when the other is depress'd, that the Force may be the better at all Times equally exerted. The Pieces *b* and *i* being pretty long, it is proper, in order to steady 'em, and prevent their swerving, to connect them together by cross Stays, or Bits of Wood about the Places *E* and *F*. The Handles *e* and *f* are hollow wooden Tubes riding on Iron Spikes. The Height of the Frame of the Mill from *G* to the Ground, is about three Feet.

My Method of making Cyder.

After grinding, I squeeze my Apples very hard with a strong Screw Press, wrought with a Capstern, in Hair Cloths, reev'd or drawn into the Form of a circular Bag, by means of Strings or Loops, four or five Bushels at a Time, in as many Bags, with a round Board two Inches thick, put between each Bag. These Boards are made of Inch Plank nail'd together cross-grain'd. When the Apples are one Time squeez'd, I order the Cakes or Cheeses to be rubbed to Pieces, and ground and press'd over again; and if this were to be repeated even a third Time, it would answer the Pains, for it would procure Liquor enough to pay the Wages of two Men for a Day; that is to defray the Charges of the Labour of your Cyder making.

making. Twelve Bushels of Apples heap'd (which is the usual Way of measuring Apples) will by this Method most commonly yield more Juice than will fill a Beer Hogshead: About two Thirds of the Liquor runs out at the first pressing, the remaining Third at the following ones.



*An Account of a Warren, and its Profits,
from Mr. William Gilbert, Master of
the famous Warren now upon Auborne
Chase.*

*A*Uborne Chase, which of long Date has been allow'd to produce the best Rabbits in England, is situate in North Wiltshire; the Warren Part was once of vast Extent, but is now reduced to about 700 Acres; and tho' the Ground which is now in Warren is commonly judged to be one of the most barren Parts of England, from the exceeding shortness and smallness of its Grass, yet we are assur'd that those Parts which have been plough'd up, of the same Kind, at the Reduction of the Warren, produc'd the most luxuriant Crops of Corn that has been known to grow in the Kingdom, which happen'd, as is suppos'd, from the Soil being render'd fine by the working of the Rabbits, and also from
the

the large Share of Vegetative Salts, proceeding from the Dung and Urine which by plowing were regularly mix'd, and thereby render'd fruitful.

The Soil is Chalk, partaking a little of a reddish sandy Loam somewhat stoney, with an hard Rock at the Bottom. The Surface which is hardly more than two Inches in Thickness, partakes more of the Loam than of the Chalk; and upon the nicest Observations, I could not find any other Herb growing upon it than Nettles, Ragwort, and Silver-weed, and those only where the Ground had been disturb'd in some Places. I also observ'd the Elder to thrive very well in this Warren; and I suppose that many other Kinds of Trees and Herbs might be made to grow there, if they were cultivated, as I shall endeavour to prove by and by, from Example.

'Tis remarkable however, that the Rabbits of this Warren, as it is now, are very fat in the dryest Summer; and even in the most severe Winter, their Kidneys can hardly be discover'd for the Fat upon them; this last I imagine may depend partly upon the Fodder which is given them in the severe Season, and when the Snow is on the Ground, as well as upon the Fineness of the Grass they feed upon in the Summer: The Fodder given to the Rabbits in the Winter, besides the fine Hay

Hay of that Country, is chiefly the Hazle, whose *Bark* they devour very greedily; and as I observ'd before, the fine Grass which they feed upon in the Summer, is very nourishing to them, and keeps their Bodies in good Plight, from a Virtue in it which prevents the Rot among them; so I suppose that the fine Hay of that Country, and the Hazle Bark, contribute no less to their Welfare, by furnishing them with Nourishment not over abounding with Moisture: And in the Pasture Grounds about this Warren, which are like it in Soil, it is observable, that the Sheep never are subject to the Rot in the wettest Season; and tho' one could hardly think the Grass was long enough for their Bite, yet many Cows are kept upon that short Turf, and receive so much wholesome Nourishment from it, that their Milk is much richer than that of the Cows in the Vale, where the Grass is luxuriant, insomuch that upon Trial, two Gallons of the Milk of the *Aubourn* fed Cattle upon short Grass, always yields more Cream than three Gallons of Milk of the Cows fed in the Vale upon long Grass: So that the Cheese made from the *Aubourn* Cows, is much richer and fatter than what is made from the Cows of the Vale, as I find by Experience: Indeed, the Cows which feed upon this short Grass, hardly yield three fourths of the Quantity of Milk that the
Cows

Cows of the Vale usually do; but then the Goodness of it is so far beyond the other, that if it was but half the Quantity, the Price of the Cheefe made of such Milk will sufficiently recompence the Want of Measure; but especially if the same Method was to be taken here in making the Cheefe as is used at *Stilton*, which is esteem'd the best in *England*; the Receipt of which I have publish'd in my Monthly Papers for the Month of *March*, 1721.

From these Examples we may conclude, that there is in this Sort of Grass an excellent rich Quality, which affords an extraordinary Nourishment for Cattle, and renders them healthful and wholesome for our Use; for as they are well nourish'd, and preserv'd in Health, by such Food, so we may reasonably judge, that the Flesh of such Animals, and their Milk likewise, which is free from Distemper, must be nourishing to Mankind, who makes 'em so great a Part of his Diet.

And now I have done with the Soil, as far as it concerns the Rabbits and their Food, it will be necessary to hint that this Warren is wall'd about so that they have not the Liberty of searching their Food elsewhere; therefore 'tis only what they get in the Warren which brings them to that Perfection, which gives them their superior Value over other Rabbits.

Of the Number of Rabbits necessary to Stock a Warren; and of the Value of good Rabbits.

MR. Gilbert, who is the present Master of *Aubourn Warren*, and has all his Life-time been bred up in that Way, tells me, that it is necessary always to keep 8000 Rabbits for a Stock, in about 700 Acres of such Ground; and judges, that one Year with another, the Increase from such a Stock is about 24000 Rabbits; but these are subject to many Accidents, by Poachers, by Weezels, Polecats, Foxes, and Distempers, tho' the greatest Care be taken of them by watching, setting of Ginns, or in their Food. To view the Warren in its present State, one would suppose that the Food there would hardly maintain half so many; but yet we find by his Method of Management, that he loses few of them, and his Warren is always in better Case than others, and his Rabbits of a greater Price; they are known from others by being shorter legg'd, and shorter body'd, and thicker; and are highly admir'd for the extraordinary Sweetness of their Flesh, which is as far superior to that of other Rabbits, as the Down Mut-

ton

ton excels the Flesh of the larger Kind of Sheep fed in long Grass.

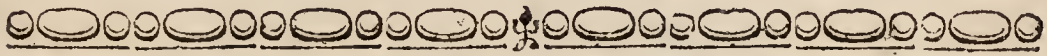
The Time when he first begins to kill them in Quantity for the *London* Markets, is about *Bartholomew-tide*; and from that Time to *Michaelmas*, delivers them at *London* for nine Shillings *per* Dozen, free of Charges; but from *Michaelmas* to *Christmas* has Ten Shillings and Six-pence for each Dozen, deliver'd in *London*, himself being still at the Expence of Carriage, which amounts to Twenty Shillings *per* Hundred, which is Six Score. The Reason, he tells me, why the Price of Rabbits is less between *Bartholomew-tide* and *Michaelmas*, than between *Michaelmas* and *Christmas*, is, because the Skins are not perfect 'till *Michaelmas*, and then they are not worth above a Penny a-piece, and then the warm Weather will not suffer the Rabbits to keep fit for eating above two or three Days; but from *Michaelmas* to *Christmas* the Skins are in Perfection, and are worth near Six-pence a-piece, or about Five Shillings *per* Dozen, and the Weather will suffer the Rabbits to keep perfect for four or five Days after killing. This explains to me a Difficulty which otherwise I could never have surmounted; for it is commonly practis'd in *London*, to sell the Rabbits without their Skins for Ten-pence or Twelve-pence apiece 'till about *Michaelmas*; and from that Time to *Christmas*,

when the Poulterers paid dearer for them, they have been bought for Eight Pence, and Seven Pence apiece, and even sometimes for Six Pence; but it appears by this, that 'tis the Value of the Skins, which is the chief Occasion of the Different Prices.

He acquaints me farther, that when a Skin is in Season, the Wooll or Fur is not all of the same Fineness, the coarser Sort is worth perhaps three Pence *per* Pound, the next about five Pence, and the finest, which is in the Poll of the Neck, is worth about three times as much; but when the Skin is not in Season, I am told that 'tis so hard to separate the little good Wooll from the bad, that the Trouble is almost as much worth as the Wooll it self; and therefore it appears, that the Wooll of a Rabbit in Season is worth full as much as the Flesh of the Rabbit, and we have then Rabbits cheaper in *London*. But in *Hertfordshire* there is a Warren, where all the Rabbits are of that Kind which have the Silver Hair, as they call it, and their Skins are worth Twelve-pence apiece, when they are perfect: So that for their Skins alone it is worth while to keep 'em, if the Flesh were thrown away. And one Reason why I suppose the *Aubourn* Rabbits may be valu'd in an extraordinary Manner, is because their Wooll is finer than others, from the Nature of their Food, which

will

will contribute to the Fineness or Smallness, I suppose, as a barren Land will always produce Plants consisting of much smaller Parts.



To Dr. BRADLEY, &c.

London, Sept. 6, 1723.

Dr. BRADLEY,

THY unweary'd Endeavours to promote Publick Good, deserves the Thanks and Encouragement of every Lover of his Country, and induces me to contribute my Mite to so laudable an Undertaking, being an Observation I've lately made. Many good Estates and fine Seats that lie on the Sea-Coasts, are render'd very unpleasent and Incommodious, by their exposedness to the Fury of the Weather : Some Attempts have been made to redress this Grievance, chiefly by making Plantations of Trees ; yet in many Places this hath not succeeded, which I am perswaded principally proceeds from a wrong Choice of Trees, for such Exposures. In my Journey along the Sea-Coasts of *South-Wales*, I observ'd the Great Maple, or what's commonly call'd the Sycamore,

more, compleatly to answer the Design of such exposed Plantations, it growing upright, standing Firm, and arriving to a great Magnitude, tho' in the most exposed Situation. A particular Instance of the great Service, Benefit and Beauty of this (I may say) despised Tree, is at *Morgam*, a Seat of the Lord *Mansel's*, near the Sea, where his Garden and fine Orangery is on one Side protected by a stately Grove of this Tree, and on another Side by a beautiful Row. The Gard'ner told me, that after several Essays, this Tree was only found to succeed best, and even to thrive in a Tempest. I shall submit to thy better Judgment, if this will be worth communicating to the Publick :

And am,

Thy sincere Friend,

P. Collinson.

The curious Author of the foregoing Letter has therein given us, as it were, a Plant that we had not before ; for what is any Thing to us, without we know its Use ? and hitherto, this Sycamore has always been esteem'd a meer Weed, it has never carry'd any Value : The Discovery now of its Use is like finding out a Man
of

of Merit and Learning, who has lain conceal'd for a long Time, and bringing him from his private Way of Life, to be an Instrument of publick Benefit ; and surely, such Discoveries ought to bring Honour to the Discoverer. I suppose that the Gentlemen about the West of *England* near the Sea, may reap great Advantage, by planting Groves of these Trees for Shelter, as well as those who live in the Isle of *Wight*, where the westerly Winds are very Violent and injurious ; and besides, these Trees are extraordinary quick Groves, and come up from Seed the same Spring we sow them.



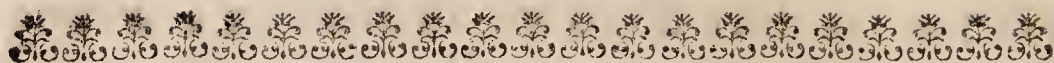
New Considerations concerning the Potting of Orange-Trees.

THERE is one Remark which I have not hinted at before in my Works, and greatly concerns the Potting of Orange-Trees ; and that is, when our Mold is light, the Tree may have a larger Pot, than when the Mold is more loamy or heavy ; for in the Business of potting of Orange-Trees, it is to be consider'd, that my general Directions for giving small Pots to them, is with a Regard to the wa-

tering them by unskilful Hands ; for when Water lyes long at the Root of an Orange-Tree, which it will do if the Earth be heavy, it chills the Root and destroys the Plant ; so commonly, when Trees are in large Pots, but especially in Tubs, they suffer by watering ; and then it is presently said, they are over potted, and the Remedy is, to shift the Tree into a lesser Pot : But if an Orange-Tree be planted in a light Mold, it will bear a bigger Pot, and yet indiscreet Waterings will do it little Harm ; for the Water does not lye cold and chilly about the Root, but passes freely and the Plant thrives ; again, there is a great deal to be said concerning the Difference between Pots and Tubs for Orange-Trees ; that is, as far as they concern the Health of Orange-Trees ; for Example, Tubs are near as broad at the Bottom as they are at Top, and hold Water much longer in their Bottoms, than a Pot will do, and therefore often hurt the Root ; and then again, if an Orange-Tree happens to out grow the Tub or Case it is in, then the Roots strike into the Wood of the Tub, and are forc'd to be torn and broken when we shift them : *Thirdly*, when it is Time for shifting them, it is difficult to disengage the Root from the Tub : And *Lastly*, the Tubs seldom last longer than four Years without rotting, or becoming unfit for Use ; and some-

sometimes through the Rottenness of a Tub, a Tree is forc'd to be shifted at a wrong Season, even so as to endanger its Growth; but a well turn'd Pot is not subject to these Inconveniencies; besides, how much cheaper a Pot is than a Tub or Case! The Pots which I approve off, to be the best in their Shape and Make, besides their Cheapness; are made and sold by Mr. *Thomas Bond*, Potter, at his Work-House in the Mouth of the Creek next the *Thames* at *Deptford*; who with a great deal of Ingenuity, makes all Sorts of Urns, Vases, and footed Flower-Pots, printed or work'd in *Basso relievo* after any Model; which, when they are painted, are not inferiour to any, that are either carv'd or cast in Lead, for the Ornament of Peers, or Walls.

Some



*Some new Improvements in the Art of
Raising Cucumbers in the Winter; by
Mr. Thomas Fowler, Gardener to
Sir Nathaniel Gould, at Stoke New-
ington, Middlesex.*

*To Mr. Bradley, Fellow of the Roy-
al Society.*

S I R,

YOU desire to know how I went on
in my raising Cucumbers in the
Winter; and so I send this to acquaint
you, that I have done what I promis'd,
in cutting Cucumbers every Month in the
Year; I shew'd you some in *December*,
which I brought to bear, by Means of a
new Frame that I invented, and answers
very well for such Things, because we
can move the Plants with the Earth, and
all from Bed to Bed as we see Occasion,
without disturbing the Plants; and I can
humour my new Frames, so that the Hot-
Beds shall never burn the Plants.

My Frames are made for one Light
a Piece, and are so small, that we can set
them, Glasses and all into any common
Hot-

Hot-Bed Frame ; my Frames are made to take all to Pieces, and have wooden Bars at the Bottom, to hold the Earth in them, till we put the Plants in a Hot-Bed, where they are to stand for good ; so when a new Hot-Bed is so hot, that it would burn any Plants, that I was to plant in it, I can set my little Frames upon it, only putting a Board between the wooden Bars at the Bottom of my Frames, and the Dung till the burning is over ; and also when the Bed is so hot, I do not put on the Light that is made for the great Frame, but only keep on the Lights upon my small Frames ; and when the Bed is in good Temper, then I can take away my Frames, and leave the Plants growing without disturbing them.

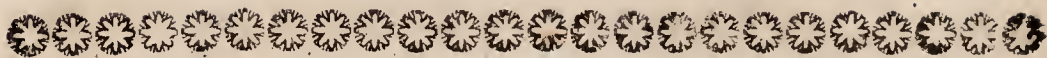
I had also Kidney Beans, and Pease, in the Winter, and the Spring, which were sown in Pots, and they bore very well ; and so I find it very easy, to have any Thing of that Sort, at any Time of Year when one pleases. I conclude Sir,

Your humble Servant,

August 24, 1723.

Thomas Fowler.

To



To Mr. BRADLEY.

An Account of a Farm of 400 Acres, Part of which, is suppos'd to be worn out Ground, and the other Part esteem'd unprofitable Heath Ground; with the Method of improving the Whole.

S I R,

I Have been three Times at different Seasons at the Farm, which I told you I had an Eye upon, for the Place of my Retirement; and shall give you as short an Account of the Nature of its Soil as I can.

I find I shall have Acres enough, there being no less then 400, besides the Orchard, Stable-Yards, the Ground, the House, Barns, &c. stand upon. Most of it is in a miserable poor Condition, having been neglected either from the Poverty, or the bad Husbandry of the late Tenant; so it will require not only a great deal of Money being laid out, but the Advice of the most skilful Husbandman, to bring it into Order.

It

Its Borders upon a large Heath, something like that between *Wimbledon* and *Putney*; above 100 Acres, of which, belongs to this Farm, and may all be inclos'd. I don't hear that the Tenant ever made 15*l. per Annum* of these 100 Acres.

The rest of the Farm has been inclos'd, and from the Age of the Trees upon the Hedge Rows, and some that stand round the old Orchard; it appears to have been done above 40 Years ago; many of the Hedges and Fences are broke down, and the Trees destroy'd, excepting some Fields near the House, the rest have been plow'd from Year to Year, while they could produce any Thing. I believe it has formerly been all black Heath, such as is mention'd above, excepting about 20 Acres, which lie low upon the Side of a little running Brook; upon which, there was a pretty good Crop of Grass, this present Year. There are about 60 Acres near the House, which have been kept in pretty good Order, and both the Grass and Corn upon them, are as good as any in the Country about. The Soil is generally Clay, and the Mold, where Justice has been done it, is black. I was by, when one of the Fields was plow'd last Winter; I observ'd it rise in gross Clods; but the Frost made it fall into fine Mold when it was dress'd; and I believe

lieve it may be brought to produce any Thing, which can be expected from strong black Soils. Of one Side of the House, I find some Fields, where the Soil for 3 Foot down is Gravel, like that about *London*; upon one of which, there is very good Wheat, the rest of them are in a very poor Condition.

They shew'd me two small Inclosures, which the Tenant had made (upon his first coming to the Farm, about ten Years ago) from the black Heath, which had never been plow'd before. The Method he took, was to put a great deal of Lime upon it; after which, he had seven Crops of Corn; the first four or five, of which, were pretty good; but very bad for the last two Years. They have not been plow'd these three Years, and as yet, there is little Grass upon them, except upon the Tops of the Ridges; which being rais'd very high, nothing but bare Clay appears upon the Sides; all the Earth which had tasted of the Lime, being now shov'd up to the Top. I made a Man dig down three Foot, and I found it strong blue Clay, with some small Veins of Yellow running through it; which last, is not so strong as the blue, and has mix'd with it some small Stones, and when I rub'd this upon my Hand, I found it mix'd with Sand or stony Gravel. There is likewise a Moisture in this Yellow, which I observ'd

observ'd run over the Clods after it was dug up, and made them appear like Yellow Sand without, tho' within they were Blue. Possibly to this Mixture of Sand or Gravel, is owing the Mold's falling so fine when it is right dress'd. I made them likewise dig down in the open Heath, and found it of the same Nature and Colours, after he got below the Roots of the Heath. But what gave me the greatest Encouragement, was, that by digging in one of the least Fields near the House, which is at present cover'd with very fine Corn, I found the Soil the same as this; after we got deeper than the Plow or Dung had gone, which makes me hope, that by good Management, it may all be made equally fertile. I must likewise tell you, that where the Hedges have not been destroy'd, there are very clean, good like Oaks and Elms, short of none of their Age in the Neighbourhood. Having given you this Account of the Farm, and the Nature of its Soil, I must beg your Opinion, how far you think it capable of Improvement, and your Advice in the Method I shall take in managing of it. It is very probable, that from my Ignorance, I may have omitted severally Particulars, which may be necessary for you to be inform'd of; and that I have not express'd myself in the proper Terms of Husbandry; but I hope you will let me know if there is
any

any Thing you desire to have farther explain'd. I shall be at too great a Distance from *London* to have Supplies of Dung from thence, so I must content myself with what can be had upon the Farm. I can have Lime pretty cheap. Neither my Corn, Milk, nor Hay, &c. can be brought to the *London* Markets.

June 16, 1723.



To Mr. BRADLEY.

S I R,

FROM Farmers we may collect the common Practice in Husbandry of their respective Countries; but it is from Gentlemen, who have given their Time and Thoughts to Improvements, that we can hope for the most useful Advices, founded upon the Experiments they have made, from their Reason and Knowledge of natural Philosophy.

My Letter of Yesterday's Date, was not gone half an Hour, when a Gentleman who has an Estate in *Dorsetshire*, and who has amus'd himself for some Years, in
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the Way I propose to do, came in to me. I presently acquainted him with my Design, and our Discourse run intirely upon Husbandry, till late in the Evening, he having been so kind as to stay and dine with me.

I shall only trouble you with the Opinion he gave me, for the managing one of the Fields, which is most worn out. In the first Place, he advis'd the plowing of it, as soon as there shall fall Rain enough to soften it; the Ground being now too hard for any such Thing's being attempted; and in this first plowing, he advises the throwing down the Earth, from the Top of the Ridges, into the Furrowes. As we have generally Rains in *September*, he proposes to plow it a second Time, when the first dry Weather shall come after the Rains; and at this second plowing, he desires that they may go deeper than he supposes ever the late Tenant has gone; so that two or three Inches of fresh Ground may be thrown up; upon which, he is for throwing a little Lime, which he says will, with the Help of the Frost in Winter, make it fall down fine; and in Case I cannot easily go deep enough with one Plow, because of the Stiffness of the Clay, he recommends the having two, the one to follow the other in the same Furrow; this will be the more necessary, because of his desiring this plowing may be cross

the Ridges ; but Men must be set to work presently, to make Drains to carry off the Water, and particular Care must be taken, to keep Water from standing upon such Land in the Winter. When the Weather is dry in *February* or *March*, he desires it may be plow'd a third Time, the common Way the Ridges run ; but still to throw it down, in Order to the bringing of it more to a Level. Presently after this plowing, he proposes, to endeavour to make it fine, by harrowing, and employing of Men, with proper Tools to break the Clods. This being done, he is for plowing of it presently again, if possible, before any Rain comes ; otherwise, it will rise in larger Clods than ever. This fourth Plowing, likewise cross the Ridges, and deep as the second, that it may be open to the Sun all Summer. In the proper Season, he is for plowing of it the fifth Time, and sowing of it with Wheat, having first dung'd it well.

He gave me Directions for preparing of the Dung ; of which, I shall acquaint you, before I finish this Letter.

By this Method, he says, I shall have a Depth of Mold equally good ; but I must not plough to the Bottom of the good Mold when I come to sow, whereby the Seed which falls into the Furrow, will have good Earth below it for Nourishment ; whereas, the common Farmers
by

by neglecting this, lose a great Part of it, by its falling upon the cold barren Clay in the Bottom of their Furrows. He gives me Encouragement, to expect a great Crop of Wheat by this Method, even from what is now the poorest. When the Wheat is cut down, he advises the plowing of it, and letting it lye all Winter, and in the Spring to sow it with Barley, and Rye Grass, which is call'd with them everlasting Grass. In Order to prepare it for the Barley and Grass, he advises the plowing of it twice; first very deep, after which, to break the Clods, harrow it till very fine, then plow it a second Time, laying it as flat as you can; sow it first with the Barley, and with the Grass, before the last harrowing is finish'd. He acknowledges that this will put me to a great Expence; but assures me that the Crops of Wheat and Barley, and the vast Crops of Grass, which I may expect for a great many Years, without being at more Expence, will fully answer my Trouble.

He gave me the following Directions, for making a large Dung-Hill, in or near the Field.

To choose a plain Spot of Ground, and there to dig a Pit sloping down to the Middle, then to throw in Horse or Cow Dung about two Foot, then to throw upon it the Earth dug up, about two

Foot thick, upon which, he desires me to put some Lime; after which, Dung again, and Earth upon that, with Lime as before. The Earth from the clearing of the Ditches, the Road, or the Rubbish from the repairing of the House, he tells me are all good Mixtures. Thus I may repeat the Dung, Earth and Lime, till it is large enough for the Field for which it is design'd, or while I can have Dung enough, carefully to cover it with Turf, or some such Thing from the Sun. To prevent too much Wet coming upon it from higher Grounds, which may be done by making a Furrow with a Plow round it, to divert such Water coming upon it; and likewise, to take care that the Moisture don't run from the Dung-Hill. To make the Dunghill broad rather than too high, and to let all this Mixture lye and ferment together, till I am ready to plow the last Time for the Wheat. If I shall find any Grass rise from the Earth, he advises the trenching of it next Spring; which he says, will mix it well together, and kill the Seeds or Roots of the Grass.

I am, Sir,

Your most

June 23, 1723.

humble Servant,

G. D.

Answer



*Answer to the foregoing Letters, with
the Method of improving the said
Land.*

To Mr. G. D.

THE Account you have sent me of your Farm is so much to the Purpose, that I think myself almost as capable of judging of it as if I had seen it: The Description you give me of the Soils sufficiently explains to me, that they may very easily be made to enrich one another; and as they are the principal Points upon which depends your Improvement, I shall begin with examining the Particulars, *viz.*

Heath Soil, which is light and open,

Gravel or Gravelly Sandy Soil, open,

Yellow Clay, the least binding or heavy,

Blue Clay, the most binding.

When we have these four Soils in an Estate, it is my Opinion you cannot complain, for in the stiff Soils there is an excellent prolifick Virtue; they abound in vegetable Riches, but by Means of an oily Quality, or rather a viscous Quality, which is in them, the Parts are so closely bound together, that they cannot act unless they are open'd; and these strong Soils in wet Seasons ruin Corn, though they produce good Grass; while the light Soil brings good Crops of Corn, and are not without tolerable Crops of Grass at such Seasons.

In dry Seasons Corn will come to good Perfection, tho' the Straw is short, upon lighter Land, and Grass will be very little worth; therefore I never prescribe Grass to be sown upon light Land, unless it be such as is commonly call'd Clover Grass; or if the Ground be gravelly, then we may sow St. Foin, which will bring a good Crop, especially if the Season be not too dry.

When I speak of these Soils in this Manner, I suppose them always upon a plain Piece of Ground, but when there are Hills, there is a great deal of Difference, for the Clay flings off the Water; and tho' the sandy Hills receive Wet, or drink it up when it falls, yet it sooner exhales, and the Crops sooner drop than those upon sandy or light Earth; on the Plain, the Declivity of the Hills answer the End of
a Drain

a Drain, and a Hill is more expos'd to the Heat of the Sun, so that Hills seldom give us any rich Produce, but as I observe, are wash'd by the Rains gently into the Vallies, and thereby give them a rich Manure; so that the Vallies bring partly from hence good Crops of every Sort: I allow too, that Vallies have commonly the Advantage of being water'd upon Floods, which oftentimes happens, and from the fine Part of the Earth which comes among the Waters, the Vallies are still better fertiliz'd, besides the Benefit the Water itself bestows upon the Earth: It is therefore no Wonder that your Ground next the River which lies low, and it may be, is sometimes overflow'd, will bring good Grass: We have an Example of that Kind in the Field which lies near the *Thames*, adjoining to the Walk which leads to Lord *Ranelagh's*, by *Chelsea*, even in the dryest Years.

I come next to Particulars, how one Sort of Soil should be fertiliz'd and improv'd by another; your Clay Ground as it happens to be more or less stiff and heavy, should have more or less of your gravel or sandy Soil laid upon it, for the Sharpness of the Sand or Gravel will open the Parts of the Clay, and after two Plowings will render that stiff Soil mellow, and fit to receive Grain; I have seen an extraordinary Crop of Barley and Clo-

Clover upon Land order'd after this Manner, insomuch that the Clover has been cut three Times the next Year after Sowing, and the Year it was sown, as soon almost as the Barley was off the Ground it was of great Use to feed and fatten Cattle.

When such Ground has lain three Years, turn it up and manure it with your black Heath Soil, that is with such of that Soil as is tender, and open'd by the Roots of the Heath; and it is likewise of great Use to burn the Heath; and lay the Heath-Ashes with the Heath Soil, upon your stiff Land, this will enrich the Ground extremely; for however Heath Ground is suppos'd barren, yet by Experience I find it to be of excellent Use, when 'tis mix'd with Clay, for the Production of Corn.

'Tis to be noted, that where the Soil is very stiff, it should be cover'd at least 2 Inches thick with the sharp Sand or gravelly Soil, but it will keep longer fertile, if it is cover'd at first four Inches thick, and especially if it be often plow'd, for every Plowing breaks and opens the Clods of Earth, and mixes the sharper Soils with the Clay; and that this Plowing may still turn better to Account, and that the Soil may be kept longer in Strength, the Crops must be often chang'd.

As for Example, when we have cut Barley that has not had Clover sow'd with it,

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it, we must plow our Ground for sowing of Turnips, which must be hough'd after they have appear'd above Ground three Weeks, to stand at the Distance mention'd in my new Improvement of Planting and Gardening, under the Title of Turnips, and manag'd as is there directed, if there are Markets for them; or else one Houghing will serve if they are for feeding Cattle, such as Cows, Oxen or Sheep; which, if they eat them upon the Spot, will still enrich the Ground, and with their Dung, and the rotten Leaves and Scraps of the Turnips, must be plow'd in early in the Spring, and then if you find the Earth too much inclin'd to clod, lay upon it some of your Heath Soil, or sharp Sand or Gravel, either single, or both together, to be again plow'd with a Breast Plow, which is a Sort of Plow much us'd in *Gloucestershire*, *Worcestershire*, and the Counties adjoining; and this Plow will break the Clods, and mix the stiff and mellow Soil together, so that 'twill be fit for Pease the same Spring, and in sowing of them we must observe, that if there is a Market to sell them while they are green, then they must be sown in Rills somewhat more than two Foot apart, or if they are design'd for Seed, then they may be sown like Grain, to stand about five or six Inches apart.

N. B. This

N. B. This Breast Plough does not open the Ground above four Inches deep.

When the Pease are off, turn up the Ground with the common Plow, and lay the Ground in Ridges for Wheat; you will then find it mellow and open, and you will have no Occasion to use either Dung, Lime, or Chalk, it will bring you such a Crop as will very well satisfy the Pains and Care you have been at, and as I have prov'd in several Places, even excels those Lays which have been fallow'd, and manur'd with Lime, Chalk, or Dung.

In this Way of dressing and managing of Land, one great Part of Expence is saved, there is no Time lost, nor does the Soil lose its vegetative Quality, but if many Sorts of Corn were to be sown upon it, so as to follow one another, the Ground must necessarily be worn out for Corn, but not for other Things of a contrary Nature, such as Turnips, Pease, Beans, &c. which draw from the Earth a quite different Nourishment.

And when a due Regard is had to change the Crops in the Manner beforemention'd, repeating now and then the Manures as above, the Ground will constantly improve: It may at any Time be laid down for Grass, by sowing it with Rye Grass, and Clover, after 'tis made as level as the Ground will allow, or else there is a Sort of *French Grass* with a purple Head, that

is a Fortnight forwarder, to cut for Hay than any other I have seen; the Farmers about *London* know it by the Name of *French Grass*.

And now I have said so much concerning the Produce of a Piece of Ground order'd according to my own Directions, it may be that the feeding of Cattle may be more profitable than Grain, but that depends chiefly on the Markets. A Lady in *Nottinghamshire* who has Pasture enough for nine Cows, employs their Milk to make Cheese, which is very like that which is so famous at *Stilton*: In one Summer she made sixty Cheeses of twenty Pound Weight each, which were so rich, that at first Hand, they were sold for sixty Pounds, which is Twelvepence *per Pound*: The Receipt for making such Cheeses is in one of my former Monthly Books,

As for the Grounds of a contrary Nature from those mention'd before, they are to be reliev'd by the stronger or stiffer Land; so that when Carriages are employ'd to bring the lighter or more easy Soil to the strong or heavy Ground, they may carry some of the strong Soil to the light Ground; but this need only be done upon such Land as you design for Corn, Grass, Pease, Turnips, and such like, for the Lands as they now are, may be render'd fit for some very useful Crops by
common

common Plowing only, without any Manure.

Your Heath Ground newly turn'd up after two Plowings, is fit to plant Saffron upon, which will turn to very good Account; it may bring you twelve Pounds an Acre, one Year with another, if you have Hands near you to gather it; for not only the Goodness, but the Quantity of the Saffron depends upon its being gather'd early in the Morning.

These Heath Grounds will likewise without manuring bring very good Potatoes, which is a Root so useful to the Poor, that I am surpriz'd any thing so valuable has yet hardly reach'd the Country. The stiffer Soils without manuring will bring excellent Beans, which may be sav'd for seed to a good Profit, especially the broad *Windsor* Bean: I have seen some Grounds which have been dug for Brick Earth that were stark Clay, and upon one plowing were planted with this Sort of Bean, that brought an extraordinary Crop.

If you have any Design of making Beds of proper Manure for your light or heavy Land, it may be done for the light Land in the following Manner: Sink a Trench a compleat Spit deep in the Ground, and lay therein some of your Clay Soil; then over that, put a Covering of Chalk or Lime, with some Heath Mold,
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and repeat the same over again, 'till you think the Heap is enough for the Ground you design, and turn this over about *Midsummer* before you use it; but if you design an Heap of Manure for your Clay Ground or stiff Soil, then make a Layer of your Sand or Gravel skreen'd, and upon that, some of your Heath Soil, and so repeat these *Stratum super Stratum* 'till you have a sufficient Quantity for your Use; and in this Case, what Rubbish you can get from the Repairs of your House, will do well to mix with it: This must be turn'd once before you use it; but when all this is done, I cannot help hinting, that the greatest Part of the Farmers are in the Wrong, when they suppose that Land cannot be esteem'd fertile, unless it produces good Wheat or Grain; and so to prepare all their Manure on Purpose for such Crops and nothing else; or that there can be no rich Manure for Land, but what is compos'd of Dung, or Lime, or Chalk. If one can make as much or more Profit by other Plants as one can by Wheat, or other Corn, it is as reasonable to sow or propagate them, as it is to sow Wheat or other Grain; and I am sure there is no Soil in the World which will not bring some Crops which may be as profitable as Wheat. Your Clay Ground when 'tis first turn'd up (tho' I do not make it

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an Instance of what I have just now said) will after a little breaking the Clods, bear a rich Crop of Flax, and with a little Care in manuring this stiff Soil with the Heath Soil, and the Heath Ashes, and a little Lime, it will be render'd fit to bear good Hops, for the Management of which I would recommend to you a little Treatise, call'd the *Hop Garden*, lately publish'd, and dedicated to me, by a Gentleman who dates it from *Maidstone* in *Kent*, it may be had at Mr. *Richardson's* a Printer, in *Salisbury Court, Fleetstreet*; in which Work you will find the necessary Directions for treating the Hop, from the first making the Ground, to the drying the Hop for Market. And that this may answer still better with you, I would advise the making a Plantation of Alders in some of the strongest Ground upon your Estate, from whence you may expect good Poles in 4 Years after planting; nor should the Willow and Black Sallow be neglected, they will produce very good Poles in four or five Years; the Hazle, the Ash, the Oak, Chesnut, and Walnut, and especially the *Scotch Firr* should be propagated upon such Ground as yours; they will be very profitable in themselves, and ornamental to your Estate, and shelter your Undercrops.

I approve very well of what the *Dorsetshire* Gentleman told you about the often plowing

plowing your worn out Field, but I am assur'd, the Expence of Dung may be sav'd since you have so many good Ingredients about you.

Having now explain'd how your several Soils may be improv'd by mixing one with the other, and by appointing to each of them the Crops which are most natural to them. We shall in the next Place consider of the best Way of dividing the Land into Parcels, and of the fencing it with proper Trees and Shrubs.

The four hundred Acres may be dispos'd after the following Manner, *viz.* two hundred Acres for Corn and Grass, one hundred Acres for Pease, Horse-Beans, Turnips, Potatoes, Kidney Beans; for Seed, *Windsor*, or other Beans; for Seed, Saffron, &c. and one hundred Acres for Wood; and the fencing in of the whole is one of the first Things to be consider'd.

The Plants or Shrubs for fencing, are the Alder, Hazle, Black Willow, Crab, and White Thorn, the two last especially make incomparable Hedges where they like their Ground; there are Men who make it their Business to get these out of the Woods, but those that are rais'd in the Nurseries are much better, being better rooted and prepar'd for transplanting; where the Crab and White Thorn will not, through the extraordinary Stiffness of the Land, come to any Perfection, the
Black

Black Willow will thrive and prosper, or Alder is so well acquainted with all Kinds of Soil, that it will prosper any where.

The Hazle likes a lighter Soil; so that one or other of them will hit every Sort of Ground you have upon your Estate; I may hint by the By, that the Willows of all Kinds, Poplars, and Alders, delight in the wettest Places, and will grow well in any Soil which is not too dry.

The Manner of making the Banks and Ditches is known so well to the Country Workmen, that it needs no Explanation; But it is sometimes necessary for the draining of Ground to consider well how to dispose them, so that they may have a Communication with one another, to prevent any standing of Water: The Method which I propose for the planting of Hedges for Fences, may be seen in the first Part of my new Improvements of planting and Gardening, where likewise may be seen the Manner of raising all the Sorts of Plants which I here mention for fencing of Ground, except the Alder which I forgot to touch upon in that Work, and indeed I would advise you to begin early with a Nursery of these and other Trees for the Embellishment and Improvement of your Estate: For though you may think perhaps as many Gentlemen do, that Trees are a long while before they grow to be of any Value, yet you will find if you
were

were to buy the young Trees and Plants which you will have Occasion for from the Nurseries, they will amount to a considerable Sum of Money; besides the Hazard of their growing by their being two or three Days out of the Ground, between the Time of taking them up, and re-planting them: But, as I hinted above, I have not given any Directions for the propagating Alder, I shall here do it in few Words: We must in *October*, provide a sufficient Number of Cuttings of the Shoots of the last Year, about two Foot in Length, and set them so deep in the Earth, that about three Buds or Knots may be buried in the Ground; it will be best to plant these Cuttings in the Places where you design them to stand, and you will have a good Fence in three Years Time, by the End of which Term, the dry Hedge will be decay'd.

The Trees for Timber, or which may be of Use upon your Soils, are the Oak, which will do well upon your blue Clay, and the Chesnut, upon the same Soil, if it is not too springey; upon your gravelly Soil, the Ash and Elm; the Walnut will prosper well upon such Clay Soil as is the least heavy; and the *Scotch Fir* will thrive extreamly upon your Heath Soil, and indeed so will the Pine, and Pinafter, which in twenty Years Time, will make Trees worth about ten Shilings *per*
F Tree,

Tree, as I have seen not only valu'd but sold at that Price, and at the same Time some of thirty Years Growth were sold for twenty five Shilings *per* Tree. Particular Directions for the raising and ordering these Trees are set down in my new Improvements, and in some of my former Monthly Treatises; but concerning the transplanting of Trees, and especially upon your stiff Soil, I must apprize you of a dangerous Method taken too frequently by the Gard'ners, which ends in the Destruction of the Trees, perhaps in three or four Years after they are transplanted, tho' they have made a good Appearance for the two first Years, and were thought to be in a thriving State.

When the Gardeners I speak of, meet with a strong heavy Soil, which they suppose to be unfit for the Tree they design to plant, the first Thing they do, is to dig a Hole or Pit in the Ground where the Tree is to stand, and to fill up that Hole with fine prepar'd Mold, and plant their Tree therein, which for a little while will grow, but when the Rains fall, the Water lodging in those confin'd Places, grows stagnant, and chills and rots the Roots of the Tree until the End is Death; but to avoid this, I prepare little Hills of the Mold which is to be found upon the Surface of such Clay Ground, and when it is beat fine with the Spade,
and

and has had Time to settle, I then plant my Trees upon the Hills in a thin Mud which quickly settles about the Roots, and keeps the Air from them, so that none fail: If we make such Plantations in *September*, even while the Leaves are green upon the Trees; if the Trees are large, we must take Care to stake them well against the Winds, or if they are very small, that Expence may be sav'd. In this Way of planting, the young *Fibres* of the Roots are unconfined and have Liberty to make their Way where they best like: But in the Holes which are dug in the Clay or cold Gravel, the Trees, if they should live 'till their Roots reach such Soil, yet being confin'd as one may say from sucking of more wholesome Food, they are poison'd, and canker till they die.

But if we raise our Trees from Seed, in order to make Woods, then I find it best to sow such as the Oak, Ash, Chesnut, and such like, with *French Furze*, which screens the young Plants from the Injuries of the Weather, and makes them shoot with clean upright Stems: An Example of this we have between *Oxford* and *Abingdon*.

When I consider farther of your Farm, I cannot omit giving you a Word or two concerning the propagating of Poultry.

In my discoursing on this Subject, I cannot better inform you of the Methods

which should be taken for the Welfare of a large Stock of Poultry, than by first laying before you the Errors which some have fallen into, who had large Numbers of Fowls bought on Purpose to make Advantage of them in breeding and fattening them for the *London* Markets.

It is now about two Years since some Gentlemen in Partnership, provided a large Piece of Ground at *Hoxton*, enclosed with a Wall, for the entertaining about eight hundred Fowles, besides Ducks, Turkeys, and Pheasants; there was a considerable Sum of Money laid out in building Houses for their Shelter, and for fattening them, and for the Hens laying and setting; and tho' there was great Skill us'd in the contriving of these Necessaries for the educating, preserving and encreasing of the Poultry, yet it seems, that for Want only of due Regard to the natural Constitution of these Fowls, they were attacked by a violent Distemper, which carried off the greatest Part of them, and by which likewise, the very Eggs were render'd so imperfect, or I may say, were so poison'd, that hardly one in twenty were prolifick; I consider'd this Case more particularly, because a Design of that Nature well carried on, might turn to very good Account, especially where it has the Advantage of the Neighbourhood of the *London* Markets. What I first took Notice of as a wrong Step, and what I

conceive was the prime Cause of disordering of the Fowls, was the Closeness of the Houses where they were confin'd in the Night Time; for though there were Windows in the Front of Lattice-Work, yet they were so small, that they could not admit of Air sufficient to keep the House sweet, nor sustain the Life of so many Creatures together, which are naturally disposed to breath a free open Air.

To have remedy'd this, in the first Place I would have advis'd, that the Front and End of the House should be made of open Lattice-Work, in order to admit a greater Fund of Air; and likewise that the Floor of such a House should lie upon a Declivity, the better to wash away the Dung into some Reservoir appointed for it without the House; for this Dung is full of Salts, and a great Enricher of Ground to be strow'd thin upon it, and even the Water which carries it into the Reservoir, is of good Use to sprinkle upon Land just before a second Plowing.

By opening thus the House to the Air, and keeping it sweet and clean, I am convinc'd that the Fowls would not be so inclin'd to droop, as they are when confin'd in a closer Place.

In the next Place we must consider, that when we attempt to feed such a Number of Fowls with Brewer's Grains, they should be always fresh, *i. e.* not more than 24 Hours old, for when they turn

four, they purge the Poultry with that Severity, as weakens them almost beyond Recovery, as I have experienc'd.

But the last and great Error which contributed the most towards the Destruction of this Undertaking, was the wrong proportioning the Number of Cocks to the Hens, for there were not above ten Cocks to accompany about 600 Females; and the Distemper which was occasion'd by this inequality, prov'd to be no less than a Pox, which was attended by very violent Symptoms; the Cocks were so strain'd in their too much Exercise with the Hens, that it was not uncommon to see them 3 or 4 Minutes in Company with a Hen without at last performing the Office of Generation, and the Hens tir'd by such an uncommon Procedure, had their Parts inflam'd to a very great Degree, and soon after there issu'd from their Nostrils a purulent Matter, which after continuing several Days, ended their Lives. It is not to be wonder'd at, if the Hens in this dangerous Condition, should lay Eggs unimpregnated; or if they had the Cocks Tread in them, that they should bring such Chickens as were unhealthy, and incapable of being brought to any tolerable Perfection.

It is therefore necessary, when we design to breed Poultry, to allow one Male to seven or eight Females, which I find by Experience

Experience to be a right Proportion; and where there are more Females to one Cock, the Eggs are uncertain in their hatching, and many are lost: As for the Objection, that many Cocks will not live together, it is only where they have not Hens enough; but where the Hens are according to the Proportion mention'd above, I have known above a Dozen Cocks agree very well in one Farm-Yard.

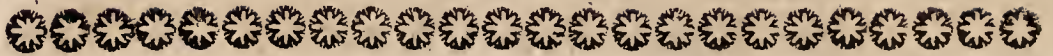
I shall conclude these Directions for the Farm, with taking Notice, that the Enlargement of your Stock of Water by making a Fish-Pond or two, will turn to Account as well for the Cattle as for the Fish it will produce; and if you are dispos'd to have as many Eatables upon your own Ground, as may be requir'd for the Service of your House, I believe you will find considerable Advantage from such a Warren as I have directed in my Monthly Works.

I am, Sir,

Your most

humble Servant

R. Bradley.



*A Method of improving Ground in Worcester-
shire, Gloucestershire, or any of
the Coal Countries.*

TO introduce this Method among such Persons as are willing to improve their Lands for Corn, in such Places where Coals are found in Plenty, it will be necessary to observe two Things.

First, That the Land in such Countries is generally strong Clay, and most frequently is that Kind which is call'd blue Clay.

Secondly, That Pit-Coal, when it burns to Ashes, is generally reduc'd into sharp Particles, as rude to the Touch as the sharpest Sea Sand; and therefore there cannot be any thing more proper to divide or open the Parts of the stiff Clay, than such Coal-Ashes; but concerning the Salts which are found in Ashes of all Sorts, I shall not here take Notice of them, nor their Use in Vegetation; I have already in my former Works mention'd something relating to them.

A Gentleman, who some Years ago bought an Estate in *Worcestershire*, was, as I am inform'd, the first that made Use of Coal-

Coal-Ashes to mend his Ground in that County ; he had Courage enough to withstand the Ridicule of the Country People, 'till his Crops open'd their Eyes ; and since that, his Method is become the common Practice with extraordinary Success: But before I enter upon his Method of proceeding, it may not be amiss to observe, that the Farmers of *Worcestershire* were us'd to practise that Way with their Land before his Time, which is call'd *Devonshireing*, which is by cutting off the Turf or Surface with a Breast-Plow, and laying it in Heaps over large Faggots of Furze, and setting the Furze on Fire in Order to reduce the Turf to Ashes ; by this Means a great Part of the Turf is burnt, but the whole Heap is never so entirely mellow'd by such Fires, but that some Turfs are left untouched, so that they must be afterwards broken to Pieces by some Instrument: This they afterwards spread over their Land, and plow'd it in to sow Corn upon.

The Gentleman I speak of which began the Improvement, had upon his Estate several Coal-Pits, and a Parcel of Land over-grown with Furze-Bushes, so that he wanted not for Materials to burn his Turf without extraordinary Charge, and so thoroughly, that one of his Heaps would make twice as much good Mold, as the Farmers had in one of theirs.

He

He had several Coal-Mines upon his Estate, and found there great Heaps of the smaller dusty Coal, round the Openings or Mouths of the Pits; this he resolv'd to use upon his Land, in Order to burn it to better Purpose than his Neighbours did with Furze alone; and therefore instead of making large Faggots of Furze, he only made small Brushes, big enough to set the Heaps of Coal and Earth on Fire; thus having prepar'd a sufficient Number of Brushes, he cut up the Turf, and made his Heaps of Earth and Coal in Lines, about four Feet Distance from each other, and to every Heap put one Brush only; when these Heaps were well consum'd, he began to plough along the Sides of these Heaps, till he had plough'd to a second Row of Heaps, and then spread one Row of Heaps upon the fresh plough'd Land, and so on till he had plough'd over his whole Ground; then with a breast Plough, he mix'd this fine Mixture with the Earth, and sow'd Wheat upon it, which prov'd so extraordinary a Crop, that all the Farmers in his Neighbourhood follow'd his Example; and by this Practice, his Land which was at his first coming to it, worth hardly 10*s.* per Acre, is now worth 2*l.* per Acre.

Considering that the small dusty Coal is esteem'd as nothing worth, and thrown away in the Coal Countries at present; this

this Hint may not be dis-serviceable to the Farmers in such Places.



Some Observations and Considerations upon the dry Summer, this present Year 1723, and of Watering, and its Use.

THE Summer of this Year 1723, has been so remarkable for its extraordinary Dryness, that I think it very necessary, to give my Reader some Memorandums which I have made concerning it: For as there has not been in the Memory of Man any Thing like it, so its Consequences too are as novel to us; which to be well consider'd, will very much help our Thoughts in many Affairs, relating to Gardening and Husbandry.

In the first Place, I observe that many Miles about *London*, there was not any Rain fell from *January* to the End *June*, that was sufficient to moisten the Earth an Inch deep; the little that did fall, did hardly so much Service, as the Dew which generally falls in a Night in the Month of *May*; and the Months of *February* and *March* were so hot and dry, that in many of the stiff Lands, the Husbandmen could not plow for Barley, but were forc'd to
leave

leave their Ground untill'd, till the Rains fell in *July*, the Time of sowing Turnips.

There was very little Grass, unless it was in such Grounds, as fortunately lay near the River *Thames*, and were overflow'd by it at the high Spring Tides. Every particular of the Gardens, which depended only upon the natural Ground, ripen'd their Fruits above three Weeks before their usual Time, Asparagus was cut upon the natural Beds, about the tenth of *March*; and it was common to see Cherries ripe upon common Walls, at the End of *April*; and Strawberries were brought to the Markets the first Week in *May*; Pease and Beans were sold at cheap Rates, about the eighth and tenth of *May*, and were all clear'd and cut up by the Beginning of *June*, which us'd to be the Time, when the plentiful Crops us'd to come first to the Markets; Grapes were in Blossom in Mr. *Fairchild's* Garden, the twentieth Day of *May*, and the *July* Grape, sweet Waters, and some others of the forward Kinds, were all ripe and gather'd before *July* was out; I mean such as were against South Walls; and then his great Variety of other Sorts, which us'd to begin to ripen about the Middle of *September*, were ripe and gone about the Middle of *August*; the Grapes this Year were perfectly good; but besides Grapes, Melons, Mulberries, Apples and Pears, we have
not

not had any Fruit worth eating this Year. The Cherries were extreamly small, and ill tasted, but abundance of them, and so Peaches, Nectarines and Abricots, which were this Year every where in vast Abundance, had their flesh tough, and their Juices sour, tho' they had all the Characteristics of full Ripeness; the Trees were so loaded with 'em, that they were sold by the last Retailers about the Streets, for three Half-Pence and Two-Pence *per* Dozen. The Badness of this Sort of Fruit, was partly owing to the over abundant Crop, which requir'd more Juices to feed them and fill their Vessels, than the Tree could have drawn from the Earth, if there had been a sufficient Quantity of Rain fallen; but as there was none at all, during the Time of their Growth, so they still were the greater Sufferers: The Vessels which compose the Fruit, had not above a third Part of the Juices in them, which the Fruit requir'd to fill them, and render it as large as it ought to be; and therefore it was impossible such Juices could be so well digested, as if the Vessels had been full, to have defended themselves from being dry'd or bak'd by the Sun. Indeed in one or two Places, where some few Peach Trees happen'd to be shaded, and watered with Skill, I saw some tolerable good Fruit; but then the Trees had but a moderate Share of Fruit upon them;

them; and so in several Places, that where the Fruit came the nearest to its natural Size, there it came the nearest to its natural Flavour.

I observ'd likewise, that the Drought was so violent this Summer, as even to make large Trees, that had been planted many Years, appear as if they were dying and past Recovery; and I much fear'd, that hardly a Peach Tree would have been sav'd, notwithstanding, I observ'd they were generally water'd: But the Waterings that I saw, were close to the Stems of the Trees, which can be of very little Benefit; for the Roots which feed a Tree, lye always the most remote from the Stem of the Tree; they are the small Fibres of the Roots, only, which receive the Nourishment, and it is them which should be water'd when a Tree has Occasion for it. But then we are to consider again, that when the extraordinary Drought requires watering the Plants, the Sun is always hot and scorching, and exhales the Water which we apply to the Roots, before the Tree or Plant can get any considerable Nourishment from it; and in such Seasons, an Hour's Sun will go near to leave a Plant as dry as it was before watering: Now where these sudden Changes happen to Plants, not only Reason, but Experience teaches us that they will not thrive, but even are sometimes lost, and
often

often drop their Leaves; 'tis therefore, I would advise the shading of such Fruit Trees, as are the most warmly expos'd, during the violent Heat of the Day, and not only that Part of the Tree which is above Ground; but that Part of the Ground, likewise, where are its fibrous Roots, so may the Waterings we give our Trees be more useful, by keeping the Ground about the Tree moist for a considerable Time; and I find, likewise, that the larger the plat of Ground is that is water'd, so much the better do the Plants thrive that are about it, the Vapour rising from it moistening the Air, and that moist Air is imbib'd by the porous Part of the Plants, and nourishes them and their Fruits, almost as much as their Roots; for this Reason, likewise, I find it has been successful, to wash the Trees about the Evening with an Hand Engine.

But to return to my Observations of this extraordinary Year. The Collections of Auricula's were in the Height of their Bloom at the End of *March*; and by the End of *April*; the Collections of Tulips were out of Flower; both which Flowers blossom'd sooner by a Month than usual; so likewise the Hawthorn, whose Flowers us'd to be rare enough at *May Day*, were blossom'd and all gone long before that Time.

This

This dry hot Season, had likewise another extraordinary Effect, in producing prodigious Numbers of Insects, such as Chafers, Ladycows, Wasps, &c. the first were in such great Flight about *Marybone*, that it was very troublesome walking thereabouts; and for the Ladycows, there were such vast Numbers of them in *St. James's Park*, that the Ground was almost cover'd with them, nor were they much less numerous in many of the Streets of *Westminster*, and several Places in *London*. About *Adon* the Wasps were so numerous, and had so many Nests in the common Fields, that the Farmers could not Plow for them, till they were partly destroy'd by the violent Rains that fell in *July*, before the End of which Month, most of the Wheat about *London* was got in, and was extraordinary good, tho' the Straw was short.

At the beginning of *August*, I observ'd the Katkins upon the Arbele, and upon the Hazle, and some likewise, were as remarkable upon the black Sallow. I may take Notice that this Summer also, there were hardly any Kidney Beans to be had; and that the Season was so bad for Cabbages, that in *July* they were sold for one Shilling, and for one Shilling and Six-Pence a-Piece; there were very few but what were made by rolling or tying up, as I shall describe by and by. In *August*,
also,

also, several Pear Trees and Apple Trees were in full Bloom, which I suppose was the Effect of the extraordinary Drought; and it may not be amiss to observe that I have experienc'd, that one Way to make Trees blossom in Autumn, is to keep them as dry as possible in Summer, and to top the young Shoots about the Middle of *June*; by this Means Trees are dispos'd to bring ripe Fruit about *Christmas*, if they have the Benefit of good Stoves; from all the foregoing Remarks, I conclude that the Seasons were a Month forwarder than usual; and for that Reason, I expect that all our Winter Pears, will be this Year as good as they generally are in *France*.



*An Account of the Manner of making
Cabbages, or of blanching Coleworts.*

SINCE the blanching of Herbs has been commonly practic'd in *Britain* for many Years; it is to be wonder'd that no Method has yet been taken among our famous Gardeners, to accelerate the ripening or whitening of Cabbages, especially, since those which come forward, are known to be so profitable in the Markets,

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that

that one single Cabbage will bring as much Money, as four or five which come late in the Year.

Mr. *Keys* of *Tutbil-Fields* tells me, that it has been a Practice for many Years in some private Gardens about *Worcestershire*, *Staffordshire*, &c. to fold up the Leaves of Coleworts or strong Cabbage Plants, and to tye them together; by which Means, in a Fortnight's Time, the inner Parts will become white, and eat as well as any Cabbage; he has practiced this in his own Garden with so good Success, that from him at last, most of the Gardeners about the Neat Houses, are fallen into that Method, and have reap'd good Sums of Money from it.

In the dry Years, especially, this will turn to extraordinary Account; for then our Plants, tho' they come from the best Seed, will be apt to run, or at best will make but thin and indifferent Heads, but here there is not a Leaf lost; and however the stragling Leaves of the Plants may be judg'd useles before they are ty'd up, they then become exceeding sweet and agreeable by blanching; but in the Practice of this Method, two Things must be carefully regarded.

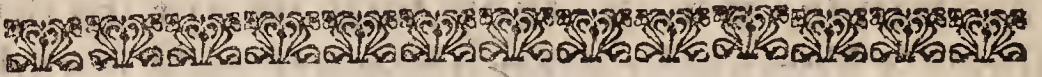
First, That the Leaves of the Plants we design to tie up, must be very dry; for if there should be any Dew or Moisture upon them, they will rot and mildew, when
they

they come to be shut up from the Air: And *Secondly*, we must fold each Leaf carefully over one another, in the exact Order they grow, beginning at the Centre 'till all the Leaves are folded; and then bind them with Bands cross-ways, from the Top of the Crown to the Stalk, in such a Manner as the Leaves may not burst the Bands, which they will be apt to do about a Fortnight after they are ty'd; and indeed we should not do more Plants in this Way at one Time, than we suppose we can use in about ten Days after they are blanch'd, for they will grow unshapely, and lose of their Sweetness: It is to be remarked, that as soon as we have tied up these Plants, they should be well-water'd at the Roots, which will fix the folded Leaves in the Order we have plac'd them, and accelerate their Whitening, which at most will be in a Fortnight. I think too, that by tying up some Colewort Plants in the early Season of the Year, they would eat much better for being blanch'd, but that is according to every one's Palate. I might have mention'd in my Remarks on the dry Summer, that though few Trees were blighted in the Spring by scorching Winds, or small Insects, yet the Herbage was very much annoy'd by the Caterpillar, which severely attack'd the few Cabbages we had, so that even of the few, at least one half were

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spoil'd.

spoil'd. Mr. *James Brussard*, Gardener to his Grace the Duke of *Devonshire*, at *Chatworth*, has lately at my Request, sent me the following Account of his Method for curing blighted Trees, and Plants infested with Caterpillars, which I think may oblige the Reader.



To Mr. BRADLEY, &c.

S I R,

I Receiv'd yours, and should be glad to inform you of any thing worth inserting in your Books ; as for preventing of Blights, I cannot say any thing to that, but I have recover'd several Fruit-Trees, as Cherries, Dwarf-Apples, and Plumbs ; as also Cabbages, and other Garden-Stuff of that Kind, (after the Fruit and Plants were blighted, and began to wither) by a Water made with Tobacco-Stalks ; I water'd the Trees with the said Water, and in a very short Time the Leaves and Fruit began to recover, and grow to their full Perfection. This Tobacco-Water hath recover'd those that were water'd with it, and those that were not, it is a Question whether they will live to bear another Year.

I have

I have had two Years Experience of this Water with great Success, and find it answer beyond any Thing that I ever made Use of. I chiefly found this out by a Man that chew'd Tobacco, who spit upon a Newt, and a Toad, and thereby destroy'd them, from whence I suppos'd it a great Destroyer of all Sorts of Vermin.

I made two Hogheads of Water, by infusing six or seven Pounds of Tobacco-Stalks, tho' one may add more as Occasion serves. I am now trying another Ingredient, which I find to be a great Destroyer of Insects, which *Sir*, if it should prove effectual, I shall be glad to oblige you with,

I am, Sir,

Your most

Humble Servant

James Bruffard.

The Use of Tobacco in such Cases, has long been practis'd with Success, to destroy the Insects that infest Plants, by strewing Tobacco-Dust upon them, and by making a Fumigation of it under Trees; so I doubt not but the Infusion of Tobacco Stalks in Water will answer the End full as well, and may be done with less Trouble: But I shall take this Opportuni-

ty before I leave the Subject of the destroying of Insects, to introduce a very curious Letter I have lately receiv'd, which has already met with the Approbation of so many ingenious Gentlemen that I have shewn it to, that I am perswaded, my Readers would lose a considerable Entertainment if I was not to make it publick.



To Dr. BRADLEY, F. R. S.

S I R,

Reading lately Mr. *Mortimer's* Treatise of Husbandry, I took Notice of his remarkable Prejudice against the wing'd Species, insomuch as to wish for a Law for extirpating several Tribes of them. I shall in this beg Leave to be an Advocate for these Innocents who cannot speak for themselves; and endeavour to shew, that the Services they do us, abundantly balance the Inconveniencies; and that instead of being Nufances, they are Blessings, and that without them, we should be like the Land of *Ægypt* under the Curse, that the Grasshoppers would come, and Caterpillars innumerable, and would eat up all the Grass in our Land, and devour the Fruit of our Ground, and multiply so exceedingly,

ingly, as to creep into our Kings Palaces; and Flies would so abound, as to be extremely incommodious to us.

In Order to make some Estimate of their Services; I lately observ'd a Couple of Sparrows who had Young Ones, and made 20 Turns each *per Hour*; and reckoning but 12 Hours *per Day*, let us compute what a Number of those Vermin were destroy'd by that Nest alone.

40 Caterpillars *per Hour*
12 Hours of feeding *per Day*,

480 Caterpillars destroy'd *per Day*,
7 Days suppos'd between Hatching
and Flight,

3360 Caterpillars destroy'd by one Nest
alone in one Week.

But I hear that the Wren, Tom-tit, and other numerous Breeders, destroy a much greater Number. And I believe, most Birds feed 14 or 15 Hours *per Day*, whereas I have reckon'd but 12; and 'tis certain likewise, I might add more Days to the Computation, but I was willing to keep within Bounds.

At a Gardener's where I lodg'd, 5 Miles off this City, we had in the House, Barn, and Stable, seven Nests of Sparrows, two of Robin-red-breasts, two of Wrens, and one Redstart; in the Orchard and Hedges, one Chaffinch, one Hedge-sparrow, two

Tom-tits, two Chats, one Linnet, one Yellowhammer, and one Tit-Lark; and computing at the Rate abovemention'd of 3360 Caterpillars *per* Week, by each Nest, one with another, no less than 69560 Caterpillars were destroy'd by the twenty-one Nests, in one Weeks Time: But several of these Birds breed twice, and some thrice *per Annum*, and no Doubt but there were several other Nests which were not discover'd.

It is observable to every Body who is conversant in Gardening, that the farther from *London*, the more the Fruit; and I say also, the farther from any great Town or City: And the Reason is, the little Shelter there is for small Birds, and the great Destruction that is made amongst them by Boys, who take their Nests, and destroy their Young; and Bird-Catchers, who even in Breeding-time catch the Old; so that where there is most Shelter, there the most Birds; and where the most Birds, there the most Fruit; insomuch that were I a Master of a Garden, I would much sooner excuse those who stole my Fruit, than those who robb'd a Nest; for they pay their Landlord in Musick, and though several of them are not of the first Song, yet the different Notes, and Chirpings of different Birds, do together make a most delightful Consort, as well as their different Colours, Shape, and Size, make a most beautiful

beautiful Prospect: So that they really heighten the Pleasures of a Country Life, which would be little better than a Desert without them. The Thrush and Blackbird not only destroy Sluggs, which devour the Colewort, Cabbage, Savoys, French Beans, &c. but also where not molested, feed upon Snails, which destroy the Wall-Fruit; the Bullfinch and Tom-tit, are said to destroy Buds and Blossoms; but I have been inform'd, 'tis a vulgar Error, and that it is a little Worm that they peck out of them, and which would destroy the Bud or Blossom of itself; and which is often found in the ripe Fruit alive, and which the Parent Insect lays in the Bud or Blossom, as a proper *Nidus* wherein 'tis brought to Maturity, and receives Nourishment at the same Time: But grant that those Birds did some Harm to Buds and Blossoms; I take it, they do little more than what a judicious Gardener would do himself, who is rarely fond of an over-great Bloom, which either dwarfs the Fruit, or kills the Tree; so that the Question is, Whether Caterpillars, or Birds? Whether Fruit full grown, or stunted? Whether green-leav'd Trees, or bare Boughs, is to be wish'd for? I am convinced of the Truth of what I say, by melancholy Experience; for having a Prospect into a publick Garden, which us'd to be frequented by great Numbers
of

of Sparrows (by some evil dispos'd Persons now almost destroy'd) the Trees by the Middle of *June*, were so eaten up by Caterpillars, as to look in some of their Branches almost as bare as in the Middle of *October*. If it be said, that the Caterpillar lives on Leaves only, I answer, it is well known, that when a Tree is depriv'd of its Leaves, either by Flies, Blast, or any other Accident, the Fruit never comes to Perfection: And if these, and other Vermin, were not destroy'd by Birds, they would eat up the Fruit too, and not finding sufficient, would descend from the Trees and devour every green Thing.

The Rook is a most admirable Pattern of Vigilance and Society, different from most other Birds; they breed near one another, and keep so strict a Look out in the Night, that neither Cat, Dog, or Fox, can pass by them unobserv'd: They have extraordinary Centinels at every Avenue to the Rookery, who give Notice of every thing that approaches, at first by a gentle Call, as if half asleep, but when Noise or Danger draws nearer, they call louder and louder, and then are answer'd by the Centinel on every Tree, so that the Alarm quickly spreads.

In every Rookery that has come under my Observation, I have taken Notice of one Rook much hoarser than the rest; and him I take to be no small Officer among

mong them ; his Nest is generally near the Centre of the Rookery, upon his taking Wing they all do the like ; and when they seem to be in a Sort of Combustion upon his sounding some particular Notes, they all become silent and quiet : They feed upon Worms, and as I hear, Grasshoppers too ; which, if true, must needs balance all the Inconveniencies objected against them.

Nature has made nothing in vain, and Birds are not only delightful but also useful and necessary to us, insomuch that I could wish for a Law for their Preservation ; and that from the first of *March* to the first of *September*, it were made criminal to kill, catch, or destroy them, their Nests, Eggs, or Young-Ones : By this Means, the Game will be also preserv'd, for when Boys or other idle Persons are out seeking of Birds-Nests, they destroy all that come to Hand, and consequently Abundance of the Game likewise.

If what is contain'd in this Letter tends any ways towards an Advantage to Husbandry or Gardening, you are desir'd to make what Use of it you think fit, by

Sir,

Your most

Humble Servant.

Aug. 13, 1723.

S. C.
Upon

Upon reading the foregoing Letter to Mr. *Dubois*, Treasurer of the *East-India* Company, that Gentleman was pleas'd to communicate to me the following Observations of his own, which tend to the same End, *viz.* the destroying of Insects. In the first Place he takes Notice that about the Middle of *August* the Moth appears, which is the Destroyer of the Apple-Tree; its Wings are white, mixt with Cloth Colour: As 'tis in the Nature of Moths to fly only in the Night, so he advises the setting a lighted Candle in an Apple-Tree, at the Time they begin to fly abroad; by which Means great Numbers will burn themselves to Death, as one may observe the Morning following under the Tree; and if we consider, that every one of these Moths will lay about 300 Eggs apiece, which will hatch into Caterpillars the Spring following; then the Destruction of an hundred of these Moths is preventing the Increase of 30000 murdering Insects, and so likewise every Caterpillar or Insect, that a Bird destroys, is preventing at least 300 that would otherwise be troublesome to us the following Year.

The same curious Gentleman (Mr. *Dubois*) adds further, that he encourages the breeding of Bats, because they feed upon Night Insects; just so the Farmers encourage the

the breeding of Owls, which destroy Mice and other Vermin.

While we have yet Insects under our Consideration, we may take Notice of two other Observations of the afore said ingenious Gentleman, *viz.* that the Martin and Swallow feed upon Ladycows, which are found in their Crops: And he likewise observes, that to ease the Pain occasion'd by the Sting of a Wasp, it may be done by applying a Copper Halfpeny to the wounded Part, and holding it there for a little Space, it will presently ease the Pain, and prevent swelling: And I am assur'd by the ingenious Mr. *Milward*, Gard'ner to the Right Honourable *Robert Walpole*, Esq; that let the Sting of a Wasp be never so violent, if we apply some of the Juice of the Fig-Tree, either of its Leaves, or Fruit, the Pain immediately ceases, and the Swelling abates, though it be ever so violent.

Considering also the Mischief the Wasp does to all Manner of good Fruit when 'tis ripe, even so much that in ten Pounds Worth, they will generally if they be pretty numerous, destroy near a third Part. I cannot but recommend to my Reader the Practice of some Gentlemen who have clear'd the Country about them of those troublesome devouring Vermin; though it is at some Expence, I think 'tis not Money ill laid out; 'tis but offering to the People
about

about the Place a certain Reward for every Wasp's Nest they shall destroy, and bring as a Proof of their Work, to be burnt at the Place where they are to receive their Money; and if the Allowance is worth their While, we shall have no Reason to expect them ever after about that Place. This has been practis'd near *Hoxton*, with so much Success, that Mr. *Fairchild* tells me, that he has hardly seen half a Score all this Summer in his Gardens, though it was done by the Directions of a Gentleman of that Place several Years ago, at the Expence of five Pounds and upwards: But indeed I see no Reason why this should not be done at a Parish Expence, since it is for every ones Good as well as Ease. The Way of destroying these Vermin, is about the Evening, to put Pieces of lighted Brimstone Rags into the Holes where the Wasps Nests lie, and immediately sling a Spit of Earth over the Hole or Holes, for sometimes they are several.

And while we are speaking of Vermin that do Mischief to Gardens, I shall say a Word or two concerning the Water-Rat, which is so great a Destroyer of Fish and the Roots of Trees, and prescribe a certain Way to drive them from their Habitations; we must provide a large Number of Crackers, such as the Boys use, and place them at four, five, or six Inches Distance, upon a Yard of quick Match, which

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is fold by the Engineers; when we have dress'd as many of these quick Matches as there are Holes of the Water-Rats, we must with a Willow Twig convey the End of the Match where we have plac'd the Crackers, as far into the Hole as possible, only leaving a little of the Match out of the Hole, when this is done, one may provide a few Dogs to be in the Way against the Sport begins, which will be very diverting; then three or four Men with Portfires, which are likewise to be had at the Engineers, are to be plac'd at convenient Distances from one another, and so to fire their quick Matches at different Times, as they see Occasion; for every quick Match immediately sets Fire to the Crackers, which will upon their going off, drive the Rats that are in that Place from their Cells, and perhaps if the Dogs miss of them, they may take to some other Hole, but then he who is next to it sets Fire to that quick Match, and so the Crackers send them out again, as well as those that were in before; and by keeping on this continu'd Confusion among them, they quit their Station, if any be left alive, and never return to the same Place.



*A Catalogue of new Graffings this Year
1723, by Mr. Fairchild at Hoxton.*

FOR the further Improvement of Gardening by increasing of Plants, even such as will neither grow by cutting or Layers, or of such as one cannot readily get any Seed of: Mr. *Fairchild* has try'd several Experiments this and the last Year, in Graffing by Approach or Inarching, which are both new and curious: The following is an Account of such as have taken, and are in a prosperous Condition.

1. The *Terebinthus* upon the *Pistachio*.
2. The *Cedar of New-England* upon the *Virginian Cedar*.
3. The *Cedar of Libanus* upon the *Larix* or *Larch-Tree*, which is the more extraordinary, seeing the *Cedar* is ever-green, and the *Larix* drops its Leaves.
4. The *Casena's*, one Sort upon another.
5. The *Spanish Barba Jovis* upon the common Sort.
6. The *Yellow Indian Jessamine* upon the *English yellow Jessamine*.
7. The

7. The *Oleanders* upon one another, so that he has three or four Sorts upon one Plant.

8. *Geranium* with variegated Leaves, upon a *Geranium* with a scarlet Flower, from whence it is reasonable to suppose, all the Arboreſcent Kinds of *Geraniums* will take upon one another.

9. The *Spurge Laurel* upon the *Mezereon*, the first ever-green, the other not; in *January*, this makes a pretty Shew, to see the beautiful Blossoms of the *Mezereon* intermix'd with the variegated Leaves of the *Spurge Laurel*.

10. The *Lilac* upon the *Persian Jessamine*; so likewise the white, purple, and blue *Lilacs* may be grafted or budded upon one another.

11. The *Carolina Haw* upon the common *Hawthorn*.

12. The *Red Curran* upon the *Black Curran*, but the Taste of neither Fruit is changed, nor any Property alter'd, no more than any other Particular Fruit loses its Properties by being engrafted upon a wild Stock.

13. *Curran* upon the *Goosberry-leav'd Curran*.

14. *Live Oak* of *Virginia* upon the common *English Oak*.

15. *Ilex* upon the common *English Oak*.

16. *Holm-Oak* upon the *English Oak*.

H

17. *Cork-*

17. *Cork-Tree* upon the *English Oak*, and so may be grafted all Kinds of Oaks upon one another.

18. The *Anti-Euphorbium*, upon the *Senecio*, *Afric*, *Arboresc*, &c.

19. The *Variiegated Tree Sedum* upon the common *Tree Sedum*, and likewise several other Kinds of *Sedum* upon the *Tree Sedum*.

20. *Cotyledons* of several Kinds upon the *Tree Sedum*.

21. Vines upon Vines.

Besides these Graftings, which answer the End of propagating curious Plants with little Trouble, there is one Thing very remarkable which happen'd in Mr. *Fairchild's* Garden, from the budding or inoculating some of the *Passion-Tree*, whose Leaves were spotted with yellow, into one of that Sort of *Passion-Tree* which bears the long Fruit; now, though the Budds did not take, yet in a Fortnight's Time after budding, the yellow Spots began to shew themselves about 3 Foot above the Inoculation, and in a short Time after that, the yellow Spots appear'd on a Shoot which came out of the Ground from another Part of the Plant: Is not this as plain a Proof of the Sap's Circulation, as the Instance of the *Jesamine* mention'd before, or the Inoculation of the *Small-Pox*, is an Instance of the Circulation of the Blood? For my Part,

Part, I can't see how any Objection can be made against the many evident Proofs that has been given of it, as well in the Case of reversing of Plants, and rejuvenizing them, as in several others mention'd in my former Works ; but indeed I am not insensible that when I write, my Works fall into the Hands of two Sorts of People, the one, who, desiring to be inform'd, are curious and inquisitive, and would willingly learn ; and the other, who finding themselves Men by the Number of their Years, are either ashamed of asking Questions lest they should seem ignorant, or else think that their Age is a sufficient Warrant for their Obstinacy, and Talking of Nonsense : For the first, I have that Charity and Generosity, that I shall always, as far as my Time will permit, think myself well employ'd in instructing them ; but for the latter who are sure they know enough already, and resolve against Improvement, they are only fit to accompany one another.

But there is one Question which is a great stumbling Block to those who are but Beginners in the Knowledge of Circulation of Juices, and that is, How long Circulation is performing ? (to use their own Terms) In Answer to which, they must understand that the Motion of the Juices is constant, and that whatever impedes it,

or quickens it beyond its constant Course, tends to weaken the Plants; for the Secretions are not then rightly made; besides, the Motion of Juices is not in every Plant like, in some quicker, and in others slower, for the Circulation of Blood in one Animal, is not perform'd with the same Rapidity, that it is in another, as we find by the Beats of the Pulse; the Motion of the Pulse of a Snail, or of its Heart, as one may observe by taking off the Shell, is six or seven Times slower than the Beats of the Pulse in an Human Body; and the Pulse of an Human Body is more than that slower than the Pulse of a Squirrel; supposing all three to be in an equal State of Health. Now, as this Circulation must be continual from the very first of Life to the Moment of Death; so we must consider too, that the Food or Nourishment receiv'd every Day, adds to the Juices that were in the Body before, which must either encrease the Bulk of the Body, or else be the Occasion of a Discharge of Juices from that Body, or both together; so that were it possible to fix upon any one Drop of Juice in a Body which one might suppose was the Leader of the rest through all the Channels, 'till it gain'd the Place it first set out from; what with the new Nourishment that would be receiv'd into the Body, and the Parts that would be secreted from this Drop, in its Passage,
such

such Drop as well as all the rest would be so chang'd and alter'd, as to be no more the same it was at first; but if by the Question they ask, they mean, How long the infected Matter inoculated will be before it shews itself in the remote Parts of the Plant? Then we answer, that it is parallel with the Case of inoculating the Small-Pox on Human Bodies, which is sooner or later in shewing the Poison, as the Body is in more or less Vigour, when the Inoculation is made; or else from the Force or Power of the Poison inoculated, which sometimes is not strong enough to engage the whole Body of Juices, and then does not appear at all, or very late; it is sometimes 3 Days, sometimes 5 or 6, and sometimes ten Days or more, before the Inoculation of the Small-Pox has dispers'd itself over the Body, and infected the Blood enough to shew itself; and in Plants, we find that in the Case of the Passion-Tree abovemention'd, it was a Fortnight before the yellow Spots appear'd, and in some Plants, it is longer.

It is remarkable that the yellow Spots began first to shew themselves in the new Branches, which as it appears are of very quick Growth, shooting about three Inches and half *per* Day; I having measur'd one Shoot of a Passion Tree, which in its Growth, from the Beginning of *May* to the End of *September*, was thirty two

Foot in Length ; and it is in these quick Growers that I find the Variegations, after Inoculations soonest shew themselves.



To Mr. Bradley, F. R. S.

S I R,

AS you desire to know what new Curiosities I've got ; this is to acquaint you that I have a new Sort of Passion Tree, that bears Fruit very well upon small Plants in Pots ; I have now several of them full of Fruit, and I have never seen any before like them ; as for Graftings which I have new this Year, there is the Laurel upon the Plum, and the Laurel upon the Peach ; what I think the most extraordinary, is the Fig upon the Mulberry. The Passion Tree and the Vine, is joyn'd together by the Way, which I call touching, and I believe it will hold ; I have several Sorts of Myrtles grafted upon one another, but those you have seen before ;

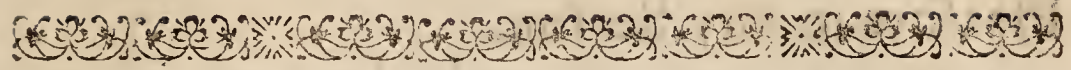
I am,

Your humble Servant,

Hoxton, August
20, 1723.

Benjamin Whitmill, Gardener.

Obfer-



Observations and Experiments upon various Subjects in Gardening ; beginning with extraordinary Remarks upon Mushrooms, and the Manner of their artificial Production.

I. **N**otwithstanding the Value which is set upon the Champignon or Mushroom, by Men of polite Taste, and the extraordinary Price which those of the best Sort will bring in the Market ; I have not been able to perswade any of our Market Gardeners, to make that Branch of Gardening their Study or Practice ; nay, even tho' they have been invited to it by Persons of Honour, who would take all off their Hands that they could raise. In the Autumn Season indeed, it is common to see them appear naturally upon old hot Beds that have been ill made ; and then it is almost as frequent, that we are told those Beds were made on Purpose to produce them ; but these Beds are inconstant giving a few for a short Space, and leave us the greatest Part of the Year without them ; whereas, if the Beds are rightly dispos'd and order'd according

according to Art, we may have them at Pleasure in any Season.

I have already observ'd in some of my former Works, that the *French* Way of making Mushroom Beds, (I mean the Method which is us'd about *Paris*, where we may continually find several Acres of these Beds) is to make each Bed at twice, and that we must only use pure Stone Horse Dung ; each Parcel to be toss'd up fifteen Days in a dry Place before we use it, and kept during that Time free from Wet ; which must unavoidably be observ'd, or we cannot hope for good Success, and there seems to be good Reason for it ; for by this making of the Bed at twice, the Bed partakes of two different Heats at the same Time ; the first Part by that Time it has been made fifteen Days, begins to decline in its Heat, and then the fresh Dung coming to be lay'd upon it, increases in its Heat as the first Part declines, which affords us much such another changeable Variety as we find in the Season, when Mushrooms appear of their own Accord ; and it is such Irregularity of Season, that gives Life to the Seed or Spawn of the Mushroom already in the Ground. It is to be observ'd likewise, that when the Bed is quite made, we must not cover it above an Inch thick with fine Earth ; for if it is more than that, if the Mushrooms chance to come

up,

up, they will be small and watery, especially, if the Earth be somewhat stiff; indeed if the Earth be extream Light and open, if it be lay'd a small Matter thicker than an Inch, it will not do much Harm.

I have observ'd that the *French* Gardeners, when they make Beds every Month, they put Pieces of the Mushroom Earth, as large as Walnuts into the Earth which covers the Bed, just in the Line where the two Makings of the Bed joyn; for 'tis in such a Place where the Mushroom Earth, *i. e.* that which is full of the little white Strings and Bulbs of the Mushrooms, meet with the declining and encreasing Heat, which is so necessary to make them spread and grow; and moreover, the Horse Litter which covers the Bed, contributes to retain the Vapour which rises from the Bed, and imitates in some Measure, what we call a Fog; and besides, only admits a glimmering Sun to reach the young Buttons of the Mushrooms; for too much Sun, dries the young Mushrooms and stops their Growth, and too little, suffers them to rot; therefore it is necessary the Litter we cover our Bed with, should be clear'd from all Dung, and be laid upon the Bed very light and free. I am the more particular in these Observations, because some Beds have been made for the Production of Mushrooms

rooms after my Directions, as has been said, that wanted every one of the Particulars I have here reason'd upon; and at last when it was found that no Mushrooms appear'd, the Fault was laid at my Door. But besides these Errors of making the Beds at once, and with old Dung; when I came to see them, they were made flat a Top, which is a Position that a Mushroom does not like, it holds the Water to much, and they become rotten thereby; but upon the Side of a Slope, as in the Bed I direct, is the Situation they delight in. We ought also in two or three Days after we have planted our Bed with Mushroom Earth, to be very careful to examine it Day after Day; for if a Mushroom should come up and rot upon the Ground, it will breed Maggots or Worms, that will destroy all the young Spawn or Buttons in the Ground, and then our Labour is all lost; and besides, this Examining our Beds every Day, will keep the Litter light and open upon the Beds, and so promote the Mushroom Growth.

To examine the Course of the Mushroom Fibres, we shall find at proper Distances, Knots or Knobs joyning to the Strings of the Roots, each Knot about the Bigness of a Pin's Head, running just under the Surface, in the Manner of Potatoe Roots; which Knots in a few Days,
if

if the Bed has any Heat, will come to be Mushrooms fit to gather; and we must by no Means let any of them remain upon the Bed after they begin to spread, for then they will breed Worms that will destroy all the young ones; so in the Gathering them, we must have no less Care to take all the broken Parts of the Mushrooms away, and particularly every broken Stalk, for they first are attack'd by the Worm; so likewise when we gather them or pull them out of the Ground, if we find any small spawn about the Roots, we are to separate it from the Root, and plant it immediately in some Part of the Bed where there are the fewest Mushrooms, using this Spawn very gently, so as not to bruise it; and in a few Days, in Proportion to the Heat of the Bed, it will grow and produce Mushrooms.

When we plant any of the Mushroom Earth about Autumn upon old decay'd Beds, I find it will be about ten or fifteen Days before they appear; but when we find once that the Roots spread, and begin to be full of Knots, then we may break off some Pieces of that Earth, and plant them at a Foot Distance; and by such Means, in a little Time, the whole Bed will be cover'd with them; after this Manner from one Single Root, I have in about fifteen Days Time had a whole Bed full, tho' the Bed was quite without Heat; but

but then it was at a Season when they came up naturally, but when that is not, we cannot hope for good Success in planting them, without such an hot Bed as I have directed.

From what I have here mention'd, it appears that the Mushroom increases by the Root, and may be transplanted as well as another Plant; but whether it has Seed or not, is yet a Query: But that the Directions I have given concerning the Manner of these Beds, may still be better understood, I have prevail'd upon the ingenious Mr. *Fairchild* of *Hoxton*, to make one which is now well furnish'd with Mushrooms; as also at Mr. *Benjamin Whitmils*, Gardener, near the same Place, which has the like Success; so that now I have fulfill'd, what I promis'd in some of my former monthly Papers, *viz.* to give full Instructions for the making Mushroom Beds.



Concerning a Pear Tree that bears Fruit twice a Year; at Mr. Chapman's, a curious Nursery Man, near Pitfield-Street, Hoxton.

II. **T**HERE are some Instances of Trees which naturally bear Fruit twice, and now and then three Times in a Year: The most remarkable are the Fig, the *Glastonbury* Thorn, and the Vine; but the twice bearing of these in one Year, depends so much upon a favourable Season, that it is very rare for them in *England* to ripen the Fruit of both their Seasons; the Attempt however of bearing Fruit twice in a Year, may well enough serve to inform us, that their native Countries lye between the Tropicks, where there are two Seasons in each Year, which equally does the Office of Summer; and for that Reason it is natural to Plants of such Climates to be dispos'd to blossom, and bear Fruit at both those Seasons; and I have observ'd in another Place, that all Trees and Plants, let them come from where they will, do manifestly preserve their own natural Seasons of Growth, what-

whatever Difference there happens to be between their own and this Climate, tho' they are often Sufferers in the Attempt by cold Weather, unless they be housed: But in Mr. *Chapman's* Pear Tree, there seems to be something rather more particular, for that never fails in the worst of Years to ripen two Crops of good Fruit, which only differ in the Time of their ripening, and not otherwise, as has been conjectur'd; unless it be, that the Fruit of the second Crop, is somewhat smaller than the other.

The preceding Year, Mr. *Chapman* presented me with a Branch, whereon there was several of the first Fruit almost full grown, and several of the second Crop were just then set, and both these were found upon one single Shoot, growing from Buds which were alternately plac'd upon the Shoot; and also, 'twas observable that Shoots of this Kind were found in every Part of the Tree, and not any distinct Shoots which brought only Fruit of one Crop, or single Shoots which brought forth only of the other Crop; for that would appear to be no more, than what is commonly done by Graffing, *i. e.* to have Branches separate upon the same Tree which brings Fruit that ripens at different Seasons. Indeed I find this extraordinary Summer, that a Sort of white Fig in Mr. *Fairchild's* Garden, ripen'd two Crops of
Figs

Figs very well even so as to gather of the second Crop ripe on the tenth of *September*; and at the same Place, I observ'd a Sort of Vine which had a second Crop of Grapes, almost ripe about the Middle of *September*, which I suppose might partly happen from an extraordinary Pruning Mr. *Fairchild* gave them this Year, as well as the extraordinary Season; tho' without either of these, they would have attempted a double Crop, but then, without these Helps, they would not have ripen'd.

I suppose, such Plants as seem so naturally to bear twice a Year, are made up of Vessels of different Kinds, which consequently contain Juices of different Kinds, the one Sort taking a longer or shorter Time to digest the Juices, than the other; and therefore this Doubling the Seasons in bearing may be brought to pass: The Vessels which lead to the Buds that blossom in the Spring, have their Juices sufficiently ripen'd then, for the completing the Blossom; whilst those Vessels which lead to the Buds which blossom in *July*, are crude and immature, and require some Months more to ripen them for Fruit bearing.

Mr. *Chapman* tells me, that he propagates this Tree which is call'd the *Twice Pear*, by Grafting, and that those he has grafted from it, are like it in every Respect; but then, as this is done by Grafting,
we

we must consider that a Graff has 3 or 4 Buds to it, and so may have all the Qualities in it, that are found in the old Tree, or if there was but one Bud of it to shoot, perhaps the Vessels of a different Sort that must be in the Wood of the Graff, may find Means to shew their Disposition hereafter; for every Vessel in a Plant has some Correspondence with the rest: But I have Reason to question whether a single Bud of this Tree being inoculated on a Stock, will afford any more than such Juices or Vessels as are necessary to bring Blossoms of one Season without ever offering to blossom in another: And if by trying this, we find that one Inoculation will only blossom in *July*, and another will only blossom in *April*, it will discover a great Mystery in the Nature of Plants. I may take Notice in this Place, that there is a Pear-Tree in *Norfolk*, which brings Pears of very different Kinds, the one a Summer, the other a Winter Pear, and yet both these Sorts are found upon one Twig, and even proceeding from the same Bud, nay and some of the Pears partaking both of the Summer and Winter Kind; like the Apple in *Devonshire*, which I have treated on in my Papers of the foregoing Months; wherein I have also propos'd a Method of Graffing by Approach, call'd *Touching*, and have given a Cut of it. I believe it is by some such Means that in *Marlborough* Forest

rest, there is now the Hazle join'd with the Hawthorn, so as to make one Tree, but whether they are so united, and their Juices are yet so well mixt, as that they flow together in the same Vessels, cannot be so well resolv'd, as by graffing a Branch of the Plant which partakes of both, upon an Hazle, or upon a White-thorn, upon either of which it will take, if the Vessels of both are united; unless indeed we were to cut one entirely from its Root, then we should soon see how much it depended upon the other. This leads me to consider the numerous Graffings mention'd by the Antients; and as I think nothing can seem more different in Nature, than the Hazle and Hawthorn, which by *Touching* are thus united or grown into one another; so I have more Room to think that what they have offer'd to us about graffing Plants of seeming contrary Natures, upon one another, is not so irrational as at first it appear'd to me; not considering that they might use such a Graffing as this which I call *Touching*, and is but lately reviv'd with us. By the same Means Mr. *Whitmil* abovemention'd, has this Year join'd the Fig with the Mulberry; but Time will shew how far this Graffing will be successful.



*A Remedy for Orange-Trees, and other
Trees that are troubled with the slip-
ping of their Bark.*

III. **A** Curious Gardener sends me Word, that he has large Orange-Trees, which from Time to Time fling off their Bark in Flakes of about a Foot long; the Distemper shews itself by a Speck of Gum issuing out of the Bark, and in a short Time after, the Bark flies from the Wood, and at the same Time, great Numbers of small black Insects are discover'd between the Wood and Bark. What is the Remedy?

The Method I propose to remedy this Evil, is first to cut the distemper'd Bark from the Wood, 'till there is nothing to be discern'd in the Wound but Health and Freshness, without any Spots; then wash the bare Wood with Water, wherein Tobacco-Stalks has been boyl'd, let the Water at that Time be a little warm.

To prepare the Water, take about one Pound of Tobacco-Stalks, and boyle it for this Use in a Gallon of Water, about a Quarter of an Hour: It is a sovereign Remedy against Insects, and especially those
in

in the Bark of Trees, as well as those in the Skins of Animals.

When this is done, take some *Camphire*, beat very small, and apply the Powder to the naked Wood, two or three Inches above and below the Incision, which may be done by dipping a linnen Cloth in melted Bees-Wax and Rozin; and while it is warm, strewing the Powder upon it, and then immediately applying the Plaster to the Place, and binding it on with Bafs upon the distemper'd Part; this will destroy even the Eggs of those Insects, and when it has been on about a Year, take it off, and then you may use Cow-Dung if you please to supply the Place. The two Ingredients which I mention in this Case, have destroy'd many Kinds of Insects that infest Plants; and from the Experience I have had of them, I doubt not but this Prescription will have a good Effect upon this Distemper of the Orange-Tree; when this is done, we may water the Heads of the Trees now and then with an Infusion of Tobacco-Stalks in Water.



Observations concerning Vineyards and their Produce, with some Account of the Vineyard near Bath.

IV. SINCE I find that what I have already said in my former Writings, has had so much Influence over some *English* Gentlemen, as to dispose them to undertake the planting of Vineyards with us; I shall in this conclusive Piece give my Readers some Observations I have lately made concerning their Improvement.

I shall begin with taking Notice of some Particulars relating to the celebrated Vineyard near *Bath*, which has made so much Noise in the World: In the first Place as to the Situation, it lies upon the Side of a steep Hill, facing the South, the Ground very rocky or stony: In this Place, the Vines are planted in Lines about six Foot asunder, and are treated much after the Manner that Vines are manag'd about *Germany*. The Sorts of Grapes here planted, are the White Muscadine, and the Black Cluster-Grape, which, however, they are not of proper Wine-making Grapes, and are not the most early in ripening,

ripening, yet there was made sixty-six Hogsheads of Wine four Years ago, from this Vineyard, which contains six Acres of Ground: But in the Year 1721, there was made, as I am inform'd, not above 3 Hogsheads, and the last Year, 1722, when I was there, *July* the 26th, the Vines were then hardly in Blossom, so that little could be expected from them that Year; but as there was then upon them a great deal of good bearing Wood, I suppose this Year they may produce a good Crop, especially considering the extraordinary Summer we have had: It was indeed no small Surprise to me to find the Vineyard Grapes at *Bath*, in that fine Situation, so late in Blossom, when there had been ripe Grapes above ten Days before at Mr. *Fairchild's* at *Hoxton*, which stands upon a strong Clay, and in a flat Country; and in Mr. *Warner's* Vineyard at *Rotherhitb*, the Grapes were then near fully grown, tho' they had not the Help of so favourable a Situation; but as this was plainly so in Fact, it was evident, that the Difference must proceed from the Sorts of Grapes, as well as from the Management of them; and when we come to compare the Quantity of Wine which the *Bath* Vineyard produc'd in one Year, *i. e.* sixty six Hogsheads, with the Quantity of Wine produc'd in Mr. *Warner's* Vineyard, we shall still find how much the Sort of Grape should be considered,

ed, that we design to make Wine of: For it is experienc'd, that some Kinds of Grapes will yield near Half as much more Juice as others, though we carry the same Measure of each to the Press, and as I take it, the Black Cluster-Grape yields the least Juice of any; and then, if we compute an Hog-head of such Wine worth ten Pounds, as the *Bath* Wine was sold for, then the sixty-six Hogheads at *Bath*, would be worth six hundred and sixty Pounds; but if the Grapes had been of a more juicy Kind, then the same Quantity of Grapes would have produc'd so much more Wine, as would have made it worth nine hundred and ninety Pounds, which is a vast Difference; tho' indeed no one would dislike an Acre that will yield him yearly above an hundred Pound, as the *Bath* Vineyard would do with the above Quantity, if it would bear as constantly as Mr. *Warner's* Vineyard, which has not yet mis'd

But that we may still make the Comparison more justly between these two Vineyards, I shall give my Reader an Observation or two which I made this Year at Mr. *Warner's*, which I am perswaded, will give him a very agreeable Satisfaction.

I observe in the first Place, that an hundred Stands of Vines, two Plants to a Stand, in their first Year of bearing a Crop, at Mr. *Warner's*, made ninety-five Gallons of

of Wine, and the smallest Bearer among those Vines this Year, had upwards of seventy-five Bunches of Grapes, but many of them above an hundred Bunches apiece; and yet the bearing Part of each Vine did not seem to fill much more Space than a Bushel Measure; after this Rate, then, an hundred Vines manag'd after Mr. *Warner's* Way, at the lowest Reckoning, *i. e.* 75 Branches to each Vine, will produce 7500 Bunches of Grapes; but then we must consider what Proportion of Weight each Bunch will bear to one another, for there were some smaller, and some larger so that I shall compute only 60 Bunches upon each Vine, at one Quarter of a Pound Weight each Bunch, and then an hundred Vines will produce six thousand Bunches of a Quarter of a Pound each, or about fifteen Pound Weight of Grapes upon each Vine. But that we might know what might be the Produce of these Grapes in Wine, I took an Opportunity to visit Mr. *Fairchild*, who has such Variety of Sorts of Vines for Vineyards, and with him try'd the following Experiment: We gather'd a Bunch of Grapes of the same Sort with Mr. *Warner's*, from a Standard Plant; the Bunch happen'd to weigh just one Quarter of a Pound, and pressing it as hard as we could between two flat Pieces of Wood, the Quantity of Juice which

we exprefs'd from it, weigh'd two ounces and an Half, and measur'd above Half a Quarter of a Pint, which makes ten Ounces of Juice from one Pound of Grapes, is after the Rate of $\frac{5}{8}$ in Juice, and $\frac{3}{8}$ in Hulls; now allowing Mr. *Warner's* Vines to bear 60 Bunches apiece, of one Quarter of a Pound each, and each Pound of Grapes to produce ten Ounces of Wine; then a single Vine bearing 15 Pound Weight of Grapes, will yield of Wine 9 Pints or Pounds, and $\frac{6}{8}$ Parts of a Pound, which makes one Gallon, one Pint, one Quarter, and Half Quarter of a Pint, so then the Produce in Wine of one *hundred Vines*, will be *one hundred and seventeen Gallons, one Pint and Half.*

Let us examine in the next Place how many Vines a Vineyard regularly planted, may contain in an Acre or rather, how many Vines there should properly be in a Vineyard of six Acres, which is the Dimension of the Vineyard near *Bath*, and then let us compute the Quantity of Wine such a Number of Vines will produce, according to the foregoing Calculation.

First, Our Lines of Vines should run North and South, and stand six Foot from one another, unless upon a Hill that is very steep, and then they may run East and West; for as the Lines of Vines will stand one above another, they will then have the greater Share of the Sun, for they

they need not be kept above four Foot high; but however the Lines run, there should be two Vines planted together in an Hole, and from the Centres of these Holes where the Vines stand, we should allow six Foot; so then our six Acres will take up of Vines to plant them about 14500 Plants, or a single Acre about 2416 Plants, which if they are well prun'd and order'd, and no Frosts or Blight happen to take them, will produce of Wine, according to the above Reckoning, 16965 Gallons of Wine in one Year, or a single Acre after that Rate, will produce in one Year, 2832 Gallons of Wine, which is 44 Hogsheads, 60 Gallons. The Account then stands thus, at the Rate of 10*l.* per Hogshead, each Hogshead containing 63 Gallons: 269 Hogsheads 18 Gallons, the Produce of six Acres, at ten Pounds each Hogshead, amounts to 2690*l.* or 44 Hogsheads, 60 Gallons, the Produce of one Acre, at *Ditto*, amounts to 450*l.*

Tho' I have been as exact as possible in this Calculation, yet that there may be no Room for Objection, let us suppose only ten Pounds of Grapes to each Vine, and we may then make about 30 Hogsheads of Wine, from an Acre.

But then we are to consider something of the Expence of planting and keeping these Vines; the Ground, we plant them upon cannot

cannot be worth above twenty Shillings *per* Acre, to reckon it at the highest; for the Side of a Hill, rocky, or Chalk, or Gravel, or indeed any dry Soil will do, as I have before mentioned; and then there will be no Expence for dunging or manuring the Land, as may be found in my new Improvements, &c. in the Chapter of Vines: Only to a Vineyard, there must be allow'd an understanding Man, to prune, and direct, whose Wages, I suppose 20, or 25 *l. per Annum*, and in a Vineyard of six Acres, he cannot have less than two or three Men under him to do the labouring Work at the proper Seasons; but as Labourers have different Wages in different Countries, I shall not pretend to set their Price, no more than the Rates of Wines which for this Use, I find are about twelve or fourteen Sorts, some of which, bear much more Juice in Proportion to the Bunches they are press'd from, than those I have mention'd. While I am writing this, a Gentleman who does me the Honour of a Visit, thinks the Wages of the Gardener who is to be employ'd as Master of the Vineyard, too much; but in answer to that, I only say, that if I expect Success in any Work where an Artist should be employ'd, I would always chuse a good one, and such an one will very well merit good Wages, because 'tis from his real Judgment, that the Master will receive profit; whereas

whereas on the other Hand, if we employ a Man of no Understanding, who may always be discover'd by his pretending to know every thing ; though such a Man will serve us for nothing, we shall be Losers by him ; for unguided Management in a Garden, brings all to Confusion, and robs us of that Pleasure which would be every Way profitable to us. However, as the Pruning of Vines for Vineyards has not fallen into every one's Way to see the Method of, I have prevail'd upon Mr. *Fairchild* to put about eight or ten Sorts of Vineyard Grapes into proper Order, for an Example to those who are curious to see and observe the Manner of the Vineyard Management.

In this Calculation, I have been as moderate as possible in my Account of the Profits, and have given several Allowances on that Side, which perhaps I need not have given, and though I have had an Objection made to the Wages I give the Artist for being too much, yet considering what Expence and Study an Artist requires to perfect him in his Art, as well as that he must be born with a sovereign Genius, which no Man can give ; surely the Man, who by his superiour Power of thinking, which is the Result of all these, ought not to be upon the common Level of a Labourer ; I don't say this, to create Pride or Self-Conceit in the Persons I am
speak-

speaking of, for if they should happen to be so weak as once to fall into that Snare, they will immediately place themselves in the Rank of those who ought to be their Labourers; but 'tis for the Advancement of Art I do it, which notwithstanding the Policy of the *English*, is not every Day promoted or encourag'd. In the Management of Vineyards, it has been generally thought, that the *French* are infallible in that Particular, but it is an Error which I believe a little Reason will set to Rights. In the first Place we are to consider, that all who profess Gardening with us, are not Men of the same Judgment; some will improve a Garden, while others will destroy it; and there are too many of the last Sort: Just so it is with the Vine-Dressers in *France*, where there is one that understands his Business, there are twenty that know nothing of the Matter; neither is it every Province in *France*, that has Vineyards, nor are all the People there Vine-Dressers, no more than all the People in *England* Professors of Gardening; therefore it would be very unreasonable to conclude, that every *Frenchman* of Course must understand the Management of a Vine, because there are Vineyards in *France*; as well as to think that every *Englishman* must understand a Garden or an Apple-Orchard, because we have Gardens and Orchards in *England*: And then again,

in

in the making of Wine in *France*, there are as many different Ways of Management, as there are different Ways of making Cyder in *England*; so that unless one could know which would be the most agreeable, I think better to pass by giving any single Receipt, for to give them all would be an endless Piece of Work.

It may be objected perhaps, that the Wine made in *England*, may not always be worth 10 *l. per* Hogshead, though that at *Bath*, has been sold for that Price; but if it was only to be sold for Half as much, I think there would be little Reason to complain of the Improvement, and the Charge of Vaults, Wine-Prefs, and Casks, might still very well be paid out of it; or if the Wine was thought too small, the best Brandy is always made of such Grapes as produce small Wine, as is very well known to most People of Curiosity, that have been in *France*.

As for rich Wines indeed, such as the *Tokay*, *Muscadell*, *Frontigniac*, and some others; I would not propose the making them in *England*, without the Benefit of Walls, for they will not ripen in the open Ground; but it is certain, for eating Grapes, I have hardly tasted better in any Part of *Europe*, where I have been, than of these Sorts at Mr. *Fairchild's* Garden, which had only the Benefit of common Walls to ripen them; so that whoever has an Opportunity

tunity to give them that Assistance, may undoubtedly make good Wines from them; and truly, considering the vast Quantity of Juice they contain, and the Richness of the Wine they may produce, I know not but they might pay the Landlord very well.



Of the Caper, and the Manner of pickling it.

V. **A**S I am the first who have made the Caper familiar with our Climate, I think it necessary to give my Reader a Word or two concerning it, which yet I have not mention'd in any of my Works, and that especially relating to the Method of gathering the Capers, and the pickling them for Use. I have said before that the Capers which we eat are the Blossoms of the Caper-Bush before they open, or the Flower buds of the Caper, these grow along the Shoots of the Plant, and would be very tedious to gather Bud by Bud, but their Way is to strip them off the Twigs, Leaves and all, and sift them thro' an open Sieve, which lets only the Blossom Buds pass; when this is done, we let
the

the Buds lie a Day or two in Heaps, and then putting them into very sharp Vinegar, let them remain in it eight or nine Days, and after this, shift the Buds into another Vessel of fresh Vinegar, to steep as before, and they will then be fit for Use. Mr. *Fairchild* has sent for a Quantity of the Seeds of this Plant, so that I hope a few Years will give us Plenty of Capers of our own Growth.



*Of an extraordinary Cascade of Water,
which will represent Flashes of Light-
ning*

VI. **I**N Discourse the last Year with a Gentleman of *Oxford*, concerning the Embellishments proper for Gardens, he informed me of a Curiosity in Water-Works, which I think must be very diverting, and particularly, if we should once come to follow the *French* Fashion of illuminating Woods and Gardens for Assemblies of Balls, it is to have a Water-Fall in Sheets over an Arch, and by placing Candles or Torches within the Arch, the Dashing of the Water appears like Flashes of Fire, which must have such an extraordinary Effect,

Effect, as I cannot pass over without Notice.



Some Thoughts concerning the Preservation of Timber.

VII. **T**HE general Complaint of the Decay of Timber in *Great Britain*, notwithstanding several Acts of Parliament have been made for the Preservation of it, has led me to bend my Studies more particularly to the Improvement of that useful and necessary Commodity.

I observe, that where Woods are cut down, there are not always left a sufficient Number of Standils, or young Timber-Plants to grow up in their Room, as an Act of *Q. Elizabeth* directs; and in other Places where there happens to be a due Number left standing, those are cut down as soon as they become of any small Use, and others which are no better than Twigs, are left to supply their Place; and this Method being as I am inform'd, practis'd Time after Time, is one Reason why Timber decays, and our future Hope of it is lost.

It is likewise observable, that young thriving Trees are frequently cut down by the Rabble, notwithstanding the Penalties to be inflicted upon the Aggressors, directed in some late Acts of Parliament; but we do not find any of these Persons ever convicted of their Crimes, and therefore the Evil still continues; the Parties concern'd will not arraign one another, they wink at each others Faults, and so the Timber is still destroy'd.

From hence I conceive, there can be no other Way propos'd for the Improvement and Preservation of Timber, than to make it the Interest of every one to plant and preserve it, and that I hope to do in the following Articles.

The Poor first, who make the greatest Body in the Nation, are, through their Necessities, driven sometimes to make free with their Landlord's Woods and Coppices for Fire-Wood, without being sensible of the Damage they do in cutting down the young thriving Plants or sprouting Trees in the Vigour of their Growth, to make them become Pollards; these People, as they have no Trees of their own, cannot be suppos'd capable of judging any further of the Destruction they make, than barely that what they take is of no more Value than the Price of a common Faggot, or the same Quantity of Wood sold in the Market, though perhaps the Damage done

to the Owner of the Wood may be five hundred times as much, for one may spoil twenty young thriving Trees to make up a Faggot of a Penny Value.

I have observ'd in my Travels about *England*, that in many Places Wood is so scarce that Firing is of more Value than Bread; though here are large Commons, yet the Country People have got a Notion that the Ground is barren, and will not bear Wood of any Sort, but as we are assur'd by Experience, that there is no such Ground in *England*, and that every Sort how furly soever, will naturally nourish some Tree or other; so it would be for the Interest of the People inhabiting such Places, to lay up a Parcel of their common Land for Wood, one Part for Firing, and another for Timber, which should be wholly for the Use of the Commoners, or Poor, and another Parcel for the sole Use of the Lord of the Mannor; unless where it is a Forest Land, and such Places where the King has a Right of Timber, and in such Case, the King's Part should be planted with the rest, without Expence to his Majesty.

There is a Piece of Ground which has a promising Crop of Oaks upon it, near *Oxford*, which are so well guarded with Furze, that Cattle are turn'd into it, and do the Crop of Oaks no Harm; nor is there any Necessity of weeding the tender Plants,
they

they thrive better without it; though it was once a Paradox to me, that Plants could be crouded together, without injuring one another; but it is now plain, that Plants of different Tribes, draw not only different Sorts of Food from the Earth, but shelter one another from hard Weather; so by this Method we save the Expence of fencing in our Plantations, and weeding them, which has been hitherto reckon'd the greatest Part of the Expence; and besides this, we have in three or four Years a Crop of Furze, which will be fit for the Poor to begin with while their more profitable Crop is growing, either for Pollard or Timber-Trees; and the Furze only, will have no small Welcome in some Parts of *England*, where Firing is so scarce, that even the common Weed call'd Rag-weed is cut and dry'd for Firing. It is to be understood, that the greatest Part of these Woods are to be rais'd from Mast or Seeds, which still contributes to lessen the Expence.

And that every Attempt of this Kind may prove successful, I think there should be a proper Officer appointed to examine the Soil, and allot for it the Sort of Tree that would grow best in it, and with the Justices of the Peace, or proper Inhabitants in each Place, appoint the several Parcels of Land for such Purpose; and if necessary, a small Rate made in such

Parish for defraying the Expence, rather than to let the Poor give any thing towards it.

I suppose when this is done, it will be as well the Interest of one, as the other of the Commoners in the Parish, as well as Lord of the Mannor, to preserve the Plantations from any Damage or Insult, and all together will take Care of the King's Part, which might be so settled, that in Case there could not be found a certain Number of Trees in Prosperity for the King's Use, the Parish should be oblig'd to make them good in Money; and so the same to the Lords of Mannors, in Case their Number, &c. of Trees were deficient.

By this Means I conclude that the Country may be stor'd with Timber and Fire-Wood, the Poor benefited, the Estates of the Gentry improv'd, and the Crown enrich'd, without Expence or Trouble to the Publick.

As for the Improvement of private Estates, Mr. *John Clarke*, an eminent Merchant, tells me, that in all the Leases he grants to his Tenants, he has a Clause to oblige the Tenant to plant a certain Number of Trees yearly, or at the End of 21 Years to pay him 20 s. for every one that is wanting, by which the Tenant is necessarily made the Guardian of his Plantation, and will plant and preserve his Trees more effectually

effectually than any Servant upon Hire will take the Pains to do.

It may not be improper to hint, that where we have large Tracts of Ground which are over-run with Furze, we might in such Places, employ People to plant Acorns just under the green Part of the Furze, or near the Roots of them, that when they come up the Cattle may not annoy them; the Persons whose Propriety that Land is, will certainly find their Advantage by it.



Observations on the Management of the Anana or Pine-Apple, since Mr. Telende's Method was publish'd, and of the extraordinary Growth of the Sensitive Plant, Humble Plant, and others from the warmer Parts of the West-Indies.

SINCE I publish'd Mr. *Telende's* Account of managing the Pine-Apples, I find that his extraordinary Success has encourag'd a great many to undertake the Culture of that delicious Fruit; and tho'

the Stoves which have been built by several Gentlemen for that Purpose, vary in some little Matters from the Stove at Sir *Matthew Decker's* at *Richmond*: Yet I do not find any of them that have been try'd, but what produce some extraordinary Effect or other, which leads us more into the Knowledge of the Humour of that curious Plant, as well as others which are Natives of the same Climate.

The new Frame at the Physick Garden at *Chelsea*, wherein only the Use of the Tanners Bark has been try'd this Summer 1723, by Mr. *Miller* the curious Gardener there; is an Instance, that it is not impossible to bring Plants of the Latitude of 18 or 20 Degrees to the utmost Perfection. About the Beginning of *August*, I observ'd the Sensitive Plants there about seven Foot high in Blossom, and the Humble Plants were then preparing to put forth their Flowers. The Plants call'd the Flower Fence, so much esteem'd in *Jamaica* for the Beauty of its Blossoms, and some others of the same Country, are said to be in greater Strength than they were observ'd in *Jamaica*, considering the Time of their Growth from Seed, which were put in the Ground the Spring of the same Year; so that now I hope my former Conjectures and Designs, will be rewarded in seeing all the most excellent of the *Indian* Fruits brought to
Per-

Perfection in *England*; for where such is the Success of a Frame design'd for Summer Use, I have no Room to despair.

But as for the Pine-Apples, which I design more particularly to treat of in this Place; we have Instances of their being brought to extraordinary Perfection at the Garden of the Right Honourable *Spencer Compton*, Esq; Speaker of the House of Commons, at *Chiswick*; and at that curious Gentleman's *Mr. John Warner's* at *Rotherhitb*; whom I had formerly Occasion to mention on Account of his excellent Vineyard: There are several Stoves now built by curious Gentlemen on this Account; but as they have not yet been prov'd, I shall forbear to mention them particularly, only to take Notice, that that which was erected this Summer in the Gardens of *William Parker*, Esq; near *Croydon* in *Surrey*, commands the Admiration of all the Judges that have seen it, for just Achitecture, and good Contrivance; the Design of it, besides the keeping of tender Plants during the Rigour of our Winters, and the restoring of sick Plants which is common to most Stoves, is likewise to ripen some Fruits which have been ripen'd in other Stoves here, as well as in *Holland*, and to make new Experiments on others that have not been try'd; 'tis therefore endeavour'd to make this Stove capable of being heated differently in different

ferent Parts of it, in Order to imitate in some Sort different Climates, which may be regulated according to different Heights of the Thermometer : For these Purposes it is so contriv'd, that in the Summer Time it may be useful by Means of Tanners Bark only, and in the Winter, both Tanners Bark and Fire may be us'd together, or Fire alone.

I observe in a Stove which Mr. *Fairchild* has built this Year in his Garden at *Hoxton*, for Pine-Apples, and the most tender Plants ; that he has rais'd his Fire Flues above the Surface of the Floor of the Stove, which carries very good Reason along with it ; for first as these Flues are not bury'd in the Earth, there is no Danger of their raising Damps in the House ; but on the contrary, if any Damps would rise there by any other Means, the dry Heat which will proceed from such Flues, will rectify it, and render it fit for Plants, by quickening its Motion ; for the more rarify'd is any Fluid, the quicker it is in its Motion ; so the less rarify'd is so much slower, or nearer Stagnation, and may become so dense by extream Cold, as to have no Motion at all, and become entirely fix'd ; and the Juices of a Plant are always more or less fluid, as the Temper of the Air is more or less hot or cold or dry or moist ; the Particles of Air are quicker in their Motion than the Parts of Water ;
and

and yet the Air of our Atmosphere, is no more than the refin'd Parts of Water rarify'd by Heat, which upon meeting with Cold, are condens'd in such Manner as to be again resolv'd into Water; and this Water again, by more extream Cold is fix'd in Ice; but then from that fix'd State, it may again be resolv'd into its first Condition by Heat: And this I think should be particularly consider'd by every Gardener; for unless he can judge well of the State of Air, and how to correct or change it from one State to another, he can never work in this Way with any Certainty. And for the better pointing out to every one, the exact Degree of Heat, necessary to be observ'd in a Stove, for maintaining of the Pine-Apple, it is, that the Thermometer is so serviceable to us; but I do not mean those which we meet with at every Place, for they are by no Means to be trusted, unless they were all regulated by one Standard: For I have seen in one Place, above 40 Degrees Difference in some Thermometers with printed Scales, at the very same Time, so that no right Judgment could be made from any of them; nor perhaps should we have rectify'd this Error, if it had not been for Mr. *Telende's* Success in raising the Pine-Apple, who mark'd his principal Point of Heat on a Thermometer which he had in his Stove;

and

and by which he has regulated his Heat ever since, and from thence, and several new Observations made by the Curious, we are now furnish'd with useful Thermometers of one Standard, carefully regulated by the ingenious Mr. *Fowler*, Mathematical Instrument Maker in *Switthin's Alley* near the *Royal Exchange*. As the Degree of Heat by this Means may be always known; so we are next to observe what is chiefly the Case of the Bark Heat, *i. e.* the Heat occasion'd by Tanners Bark, which has not been touch'd upon before in any of my Works.

In the Beds of Tanners Bark that are made for the Winter, I find that all the Heat they produce is confin'd within themselves, they yield no perceptible Warmth above their Surface, as the hot Beds do that are made of Horse Dung; so that they are capable only of warming the Roots of Plants, whose Pots are plung'd into them; and therefore should always have an artificial Heat by Fire, to warm the Air above, for else the tender Plants that are plung'd in the Bark in the Winter Time, will rather miscarry than come to good; for it is not to be suppos'd that the Growth of the Root can be advantageous to the Plant above Ground, when the cold Air keeps the Juices in the Vessels of the Branches and Leaves in a frozen Posture; so that they cannot move, tho' the Vegetation of
the

the Root pushes with never so great a Force ; and it is certainly the Case where there is only Heat below, and none above, as Experience shews us, that Plants languish : As there is not Sun enough in the Winter to keep the Juices above Ground in Motion, so without the Help of Fire for that Purpose, they will not thrive ; but where these two concur, (I mean the Heat below, and the Heat above) then Plants do not fail of Success, even of such as is very surprizing ; witness what I have said before of the *West-Indian* Plants, under Mr. *Miller's* Care at *Chelsea* Physick-Garden, which have been cultivated from the Spring to *September*, only by the Assistance of the *Tanners Bark*, and the *Summer's Sun*.

We are next to consider in what other Circumstances the hot Beds of *Tanners Bark* and *Horse Dung* differ from one another. *First*, from the Observations I have made ever since I began with Gardening ; I never knew the greatest Artist in the Management of the hot Beds made with *Horse Dung*, raise the Sensitive Plants above two Foot high in one Summer, nor any of the other *West-Indian* Plants above a fourth Part so tall as they are at *Chelsea*, and some other Places in the Beds of *Tanners Bark* ; and this may be for two Reasons, the one because the Heat in the *Bark* is moderate, gentle, and of long
Last ;

Last ; and the other, because it is likely the Bark partaking of a large Share of Richness from one of the strongest Vegetables, the Oak, and from one of the strongest Animals, the Ox : I say these two powerful Ingredients fermenting gently in the Bark, may be a Means of nourishing the Plants, whose Roots are plung'd into it ; for tho' the Roots are in the Pots, yet we are assur'd, that either such Nourishment may be receiv'd by the Holes at the Bottom of the Pots, or else the Moisture in the Body of the Bark, may easily be imbib'd by the Earth, of which, the Pot is compos'd, which every one knows is porous enough to receive any Humidity or Moisture ; if this be so, then the Roots may have as much Nourishment as they want ; for as I say'd before, there is nothing evaporates from this Body of Bark that is in the least to be discover'd, so that the Roots have all the Benefit of this Richness to themselves : Now, where so much Nourishment is receiv'd by the Roots or Mouths of a Body, it is necessary in Nature, that there should be some Discharge either by the Growth of the Body, which is by explaining the Parts of a Plant, or filling the Vessels fuller of Juices ; or else some other Way, which will happen as the Temper of Air is, where the same Body resides ; so is it necessary to consult the
the

the Quality of the Air, as well as the Dyet of a Plant for its Welfare.

But when we have pass'd this Consideration, we may consider a little more of the Building: I shall only say that in the Frames which are now built for the tender *West-Indian* Plants; there is near ten Times as much Air inclos'd in the Summer Time, where nothing but Bark is us'd, as I have mention'd in Mr. *Telende's* Account, and yet the Pine-Apples are in extraordinary Health. It therefore depends very much upon the Workman who builds the Frame or Stove, to understand what he is about; and particularly how to dispose the Fire-place and Flues, to know how to provide the proper Regulators for the Heat, and the Quantity of Space such a Place should fill; besides, the Particular of disposing the Glasses in the Front, which adds extreamly to the Welfare of a Plant; and this Want of Knowledge being the frequent Occasion of Miscarriages, I think my self oblig'd to inform the Curious, that Mr. *George Eden*, at the *Bricklayers-Arms* in *Miles's-Lane* near the *Monument*, is a Workman of extraordinary Capacity in these Affairs; having built several Stoves and Frames for this Use, after the most considerate Designs of the Curious; and indeed there is so much Nicety requir'd in the disposing of the Fire-Flues in the Walls and other Parts, that

that it is very necessary to employ an understanding Workman : As for the Design of a Stove of this Sort, I have prevail'd with Mr. *Rogers* of *Shoe-Lane*, a very ingenious Architect, to compose a Draught agreeable to the Use requir'd, and to the Rules of Architecture, which I shall here present my Reader with.

It is necessary to observe by the by, that the Use of the Thermometer is chiefly in the Winter ; when we make our Fires, or give artificial Heats, then we are to keep the Spirit up to Pine-Apple Heat, or thereabouts, rather above than under that Point ; but in the Summer Time the natural Heat of the Sun when it is confin'd in a Frame, will be so much, that the Spirit would be up at the Top of the Tube ; but yet, that Heat in Summer with the Addition of the Tanners Bark to the Roots, is no more than necessary for the ripening of the Fruit, as the artificial Heat in the Winter is necessary for the Growth of the Plants.

For the Use of such as may propose the propagating, or Culture of the Pine-Apple in more southern Parts ; the necessary Directions are given in the following Letter, which I drew up on Purpose for Mr. *John Clark*, an eminent Merchant at *Oporto* ; which with that ingenious Gentleman's Answer to it, may be of good Use to help our Observations, and teach us to judge

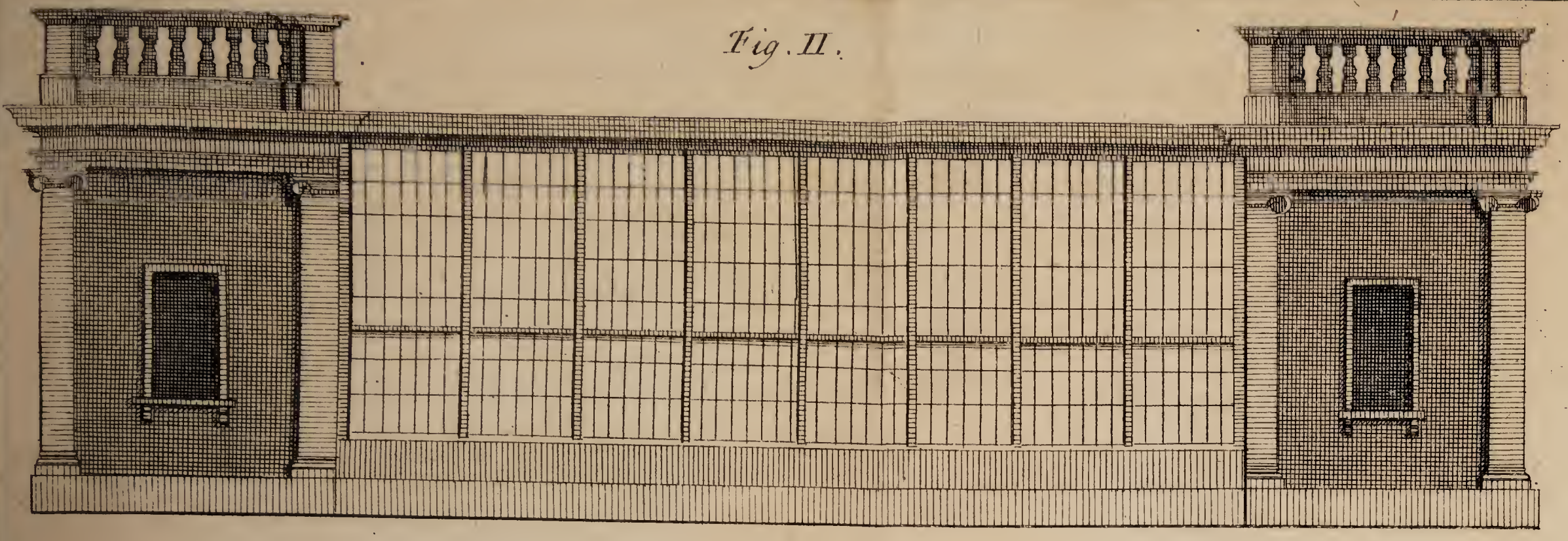


Fig. II.

Fig. I. } Is the Plan of a Stove with a Trench for the Tanners Bark, at each end is a Room 9 Feet by 8 Feet, that at the East end hath a Door out of it into the Stove, and serves the Gardner to lay his tools in, that on the West is where the Fire is kept, A the Trench, B. B. The 2 Rooms.

Fig. II. } Is the Elevation of the Front in y^e Ionick Order, wth a Ballastrade on the top of each end.

Fig. III. } Shews the Elevation of the end.

Fig. IV. } Is the Section of the end, which shews the true Elevation, the Glass ought to have, there is a Window in the end.

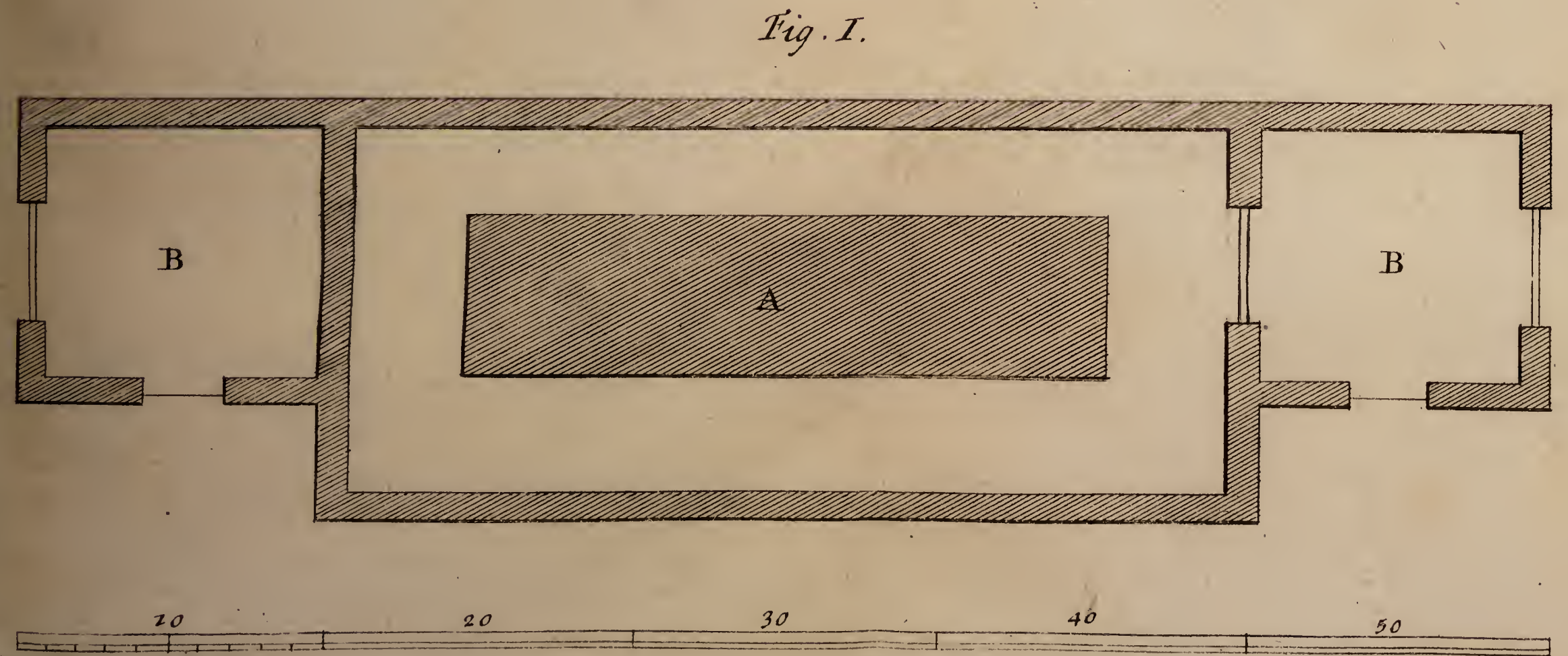


Fig. I.

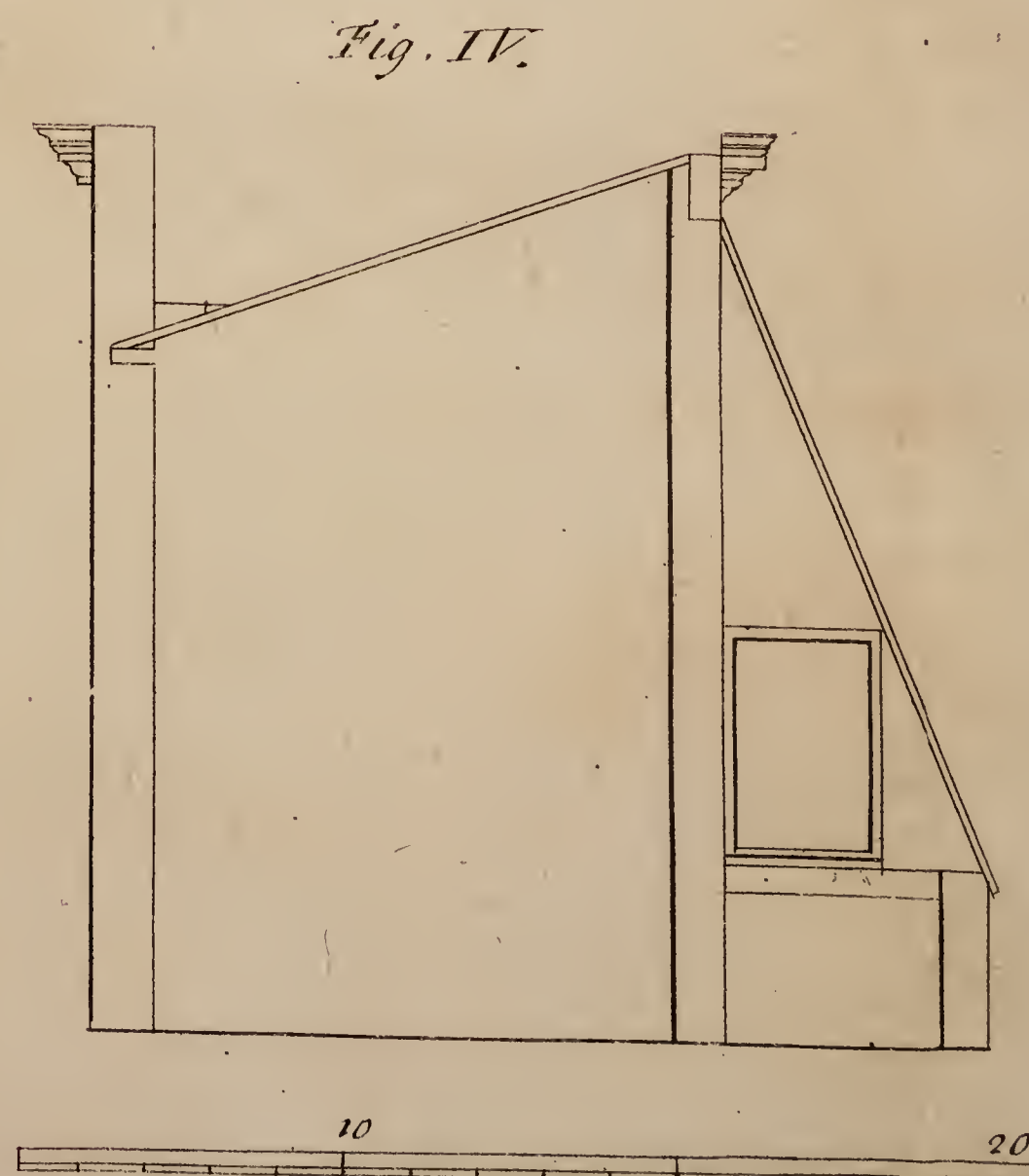


Fig. IV.

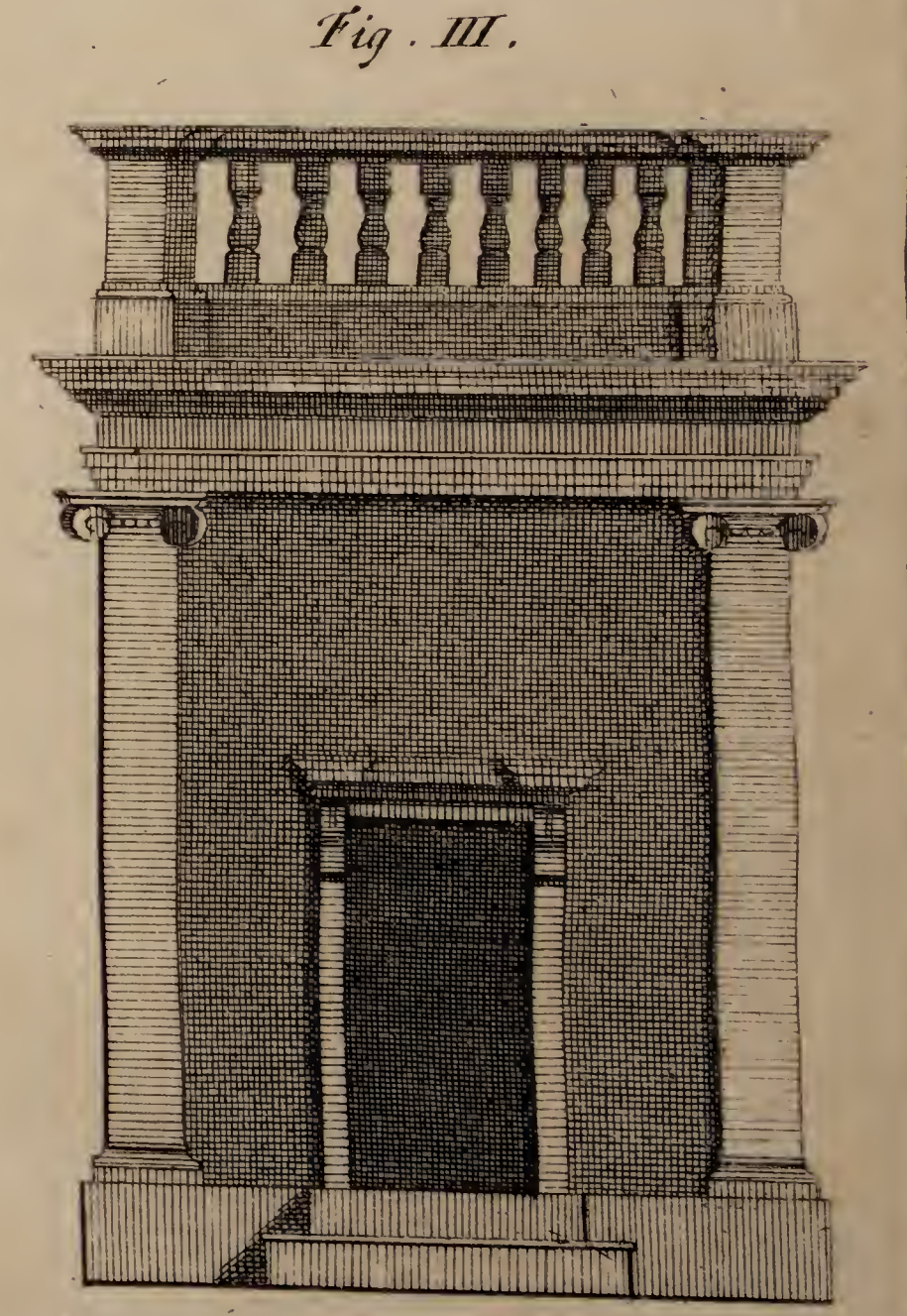
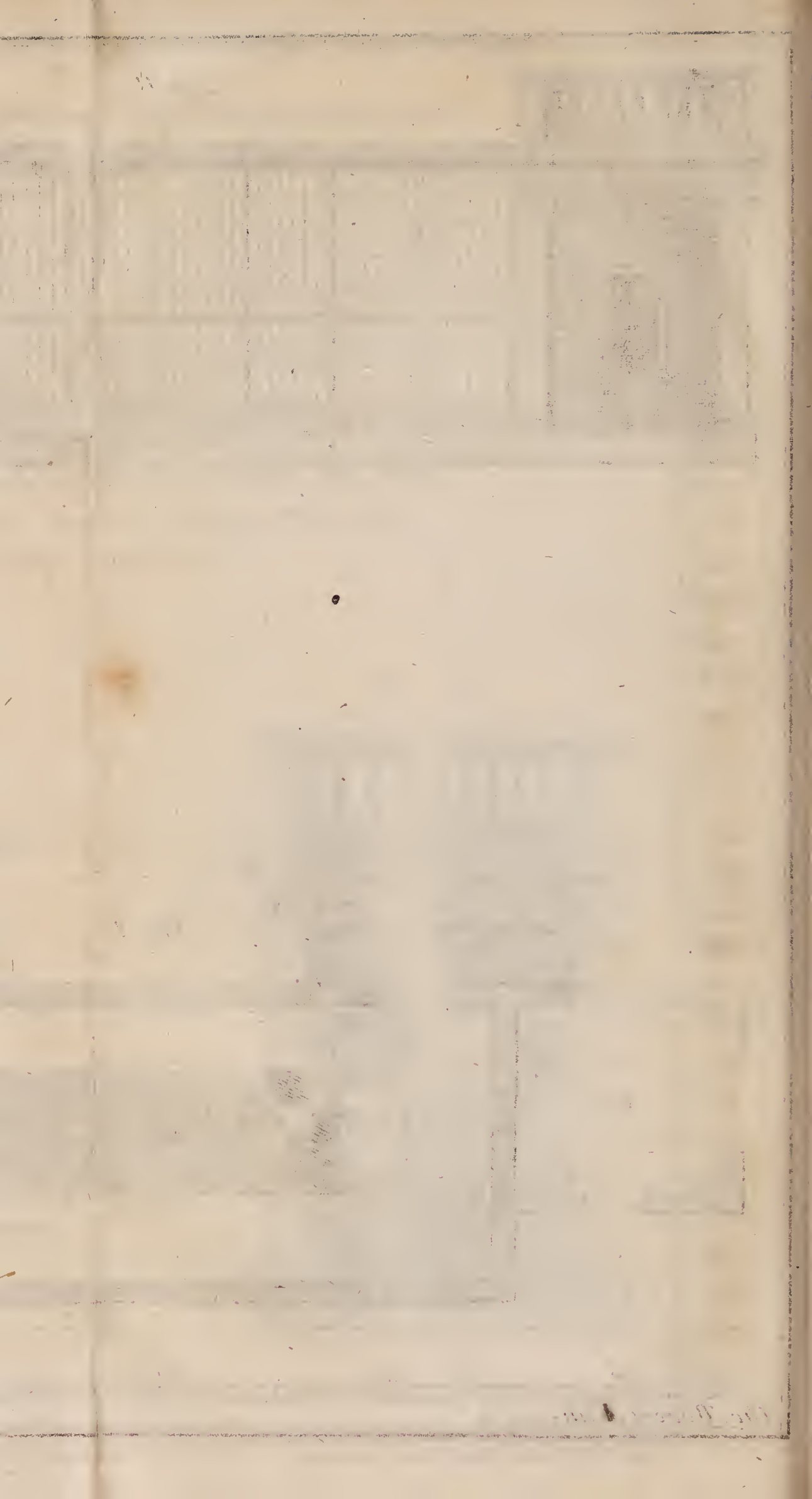
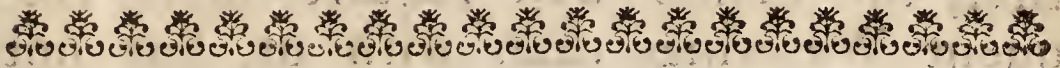


Fig. III.



judge of the Difference of Climates ; and that the Management of a Plant in one Climate, should be different from the Management of it in another Latitude.



To Mr. John Clark, Merchant, Oporto.

London, Jan. 28, 172 $\frac{2}{3}$.

S I R,

THE worthy Gentleman your Father acquaints me, that you have a Design of propagating the Anana or Pine-Apple in *Portugal* ; the Method of doing which with us you will find in a monthly Book, publish'd by me ; and which I suppose Mr. *Clark* has sent you. But as your Climate has much the Advantage of ours in ripening Fruit of any Sort, so you must surely have extraordinary Success, tho' there must be some Alteration in the Way of Management.

In the first Place, your Sun is so hot in the Summer Months, that the Glasses of your hot Bed Frames would scorch and burn your Plants, if they were to be cover'd in the hot Time of the Day ; therefore I rather recommend Frames of Canvas to cover the Plants in the Times of the Sun's great Heats, and the Glasses only to be put

put over the Plants about an Hour before Sun set, to cover them a Nights, and keep a Body of warm Air in the Frame, till the Warmth of the following Day approaches; so likewise in your hot Weather, the Plants will require more frequent Waterings than with us, but not more at a Time than we would allow them in our Climate.

Your Season of Spring, I suppose is about six Weeks before us, and as much good Time for ripening of Fruits after us: But I would gladly know from you, how far I am right in my Conjectures concerning your Spring and Autumn Seasons; and also when your great Rains fall, which will help to inform us how to cultivate Plants that come from the Country where you are.

We have got a Thermometer for you, whereby your Heats may be regulated; but it is rather to direct your artificial Heat in Winter than in Summer; for your Summer Heats will fling the Spirit so very high in the Glass, that 'twill be beyond Regulation; and as the Summer Sun is a natural Heat, so it needs not be any otherwise regarded, than by keeping it from scorching the Plants. But I shall speak a little more fully of the Use of this Thermometer, which I have chiefly contriv'd for the Use of Plants; and yours is the first that has been finish'd.

This

This Instrument shews the Degrees of Heat or warm Air necessary for Plants which grow near the Equinoctial Line, and from thence is mark'd upon the Scale the several Degrees or Proportions of warm Air requir'd for Plants which are Natives of Climates in several Degrees of Latitude, as far as 40, which is as much or more than we have Occasion to use in or about the Latitude of *London*, which is 51 Deg. 30 Min. for we find by Experience, that the Plants of *Virginia*, whose Latitude in the most Northern Point, is about 38 Degrees, will live abroad, and defend themselves against the Rigour of our Frosts. So likewise we have many Examples of Plants from the North of *Carolina*, whose Latitude is about 34 Degrees, that will generally bear our Winters without Shelter. But from about 34 Degrees to about 26 or 27 Degrees, we must Shelter them every Winter in a common Green-house, so that no Frost may invade them.

After this, as we come nearer to the Tropicks, or the Line, we must be diligent to give the Plants the several Degrees of Watering natural to the respective Climates; and for that End we should learn when the Seasons are that the Rains fall in Countries of different Latitudes. Nor should we too inadvertently attempt to harden Plants, but rather seek

to increase their Strength by making them grow and increase in their Bodies ; for in the common Way of making them hardy, though they yet live with us, they lose their natural Intent of bearing Fruit, and so become useles.

In the Culture of Plants therefore, it is not enough only to give them such a Share of Warmth, or Shelter, as will barely keep them alive ; but we must give them such Heat at proper Seasons, as may equal, if possible, that of their native Country, which in a particular Manner should be regarded in the Culture of such Plants as grow between the Tropics ; but that has remain'd an Uncertainty, 'till Mr. *Telende*, Gardener to Sir *Matthew Decker* at *Richmond* in *Surry*, luckily discover'd the Degree of warm Air in *Nevis* and *St. Christopher's*, where the Pine-Apples chiefly delight themselves, even so justly, as to bring that delicious Fruit to Perfection with us ; and as they succeed under the Influence of the Heat he gives them, so we may be sure every other Plant growing in the same Degree of Latitude, may be made to prosper with us, whether they come from the North or South Side of the Line.

It is necessary likewise to observe the Course of the Sun, in the Culture of Plants which come from any of those Latitudes mark'd in the Thermometer,
and

and apply to them the strongest Heats of their respective Countries, at the Time when the Sun is nearest those Places which they were brought from ; and when we receive Plants from Countries where the Sun passes over twice in a Year, our artificial Heats should at such Times be chiefly supported.

Thus, Sir, I have mention'd what I think will be necessary for your Use at this Time, with regard to the Thermometer ; but when I know the State of your Climate, can say more : In the meanwhile, tho' I am unknown to your Person, I am no Stranger to your Merits, and conclude,

Your most Humble Servant

To Command,

Richard Bradley.



Mr. Clarke of Oporto's Answer to the foregoing Letter.

*To Mr. Bradley, F. R. S.
London.*

S I R, Oporto, April 16, 1723.

I Am extremely obliged to you for your Favour of the 28th of *January*, and the Advice you give me concerning the Culture of the Anana's: I have had much Trouble to preserve the two Plants my Father sent me, through the little Care Masters of Ships generally take in bringing Plants; and besides, I have had a violent Fit of Sickness for three Months past, so that I have not had the Opportunity to mind their Propagation so well as to expect Fruit from them this Season, but am fully bent upon all Diligence for to have it the next.

The Anana is a Plant very common in the *Portugueze Colonies in Brazil*, that few Sea-faring Persons and Factors and have been there, are unacquainted with it.

Doubtless,

Doubtless, the Thermometer you have contriv'd, to shew the proper Degrees of Heat natural to each Plant, will render their Culture prodigiously easy; I impatiently expect that which you have been pleased to finish me, for which I give you my hearty Thanks.

We are situated here within a League of the Sea, in a Hilly, Rocky Country; few Grounds are improv'd, but what are humid, or else have little Springs of Water near them, to moisten in Summer Time. In our Wine Country, which is about Sixty Miles distant, Eastward, the Heat and Cold is more excessive than with us, by reason the Mountains are much higher and steeper. The Summer Western Sea-Breezes do not reach that Country; and the Reverberation of the Sun from those Rocky Hills, heat the Air to such a Degree, that the Night in the Summer Season is as hot as the Day.

We have our Spring sooner about a Month than in your Climate, and the same Continuance of good Weather longer in Autumn. The Winter Air is very sharp and piercing to Plants, tho' we feel little or no cold Weather; but I suppose the Reason is, that our Air is more subtle and not so condens'd as yours is. I have known in Winter a continual Rain for six Weeks, but some Years we escape without any. Our worst Months are

from the Middle of *December* to the Middle of *February*; for in the latter End we reckon Spring begins.

I observ'd in one of your Monthly Papers, the Experiment of Cutting or Laying the Branches of a Tree in the Ground, and the next Season raising the Roots into the Air, which will do the Office of the former Branches: It is the Practice here to do so in the Increase of the Fig-Tree, because they find it very tedious before it will bear from Suckers: Their Method is laying the Top Boughs of any Branch into the Ground, and in the new Season sawing off the Branch, and staking it as upright as possible; which Top Stump in the Air will shoot vigorously, and quickly give Fruit. I am told, that the *China Orange* may be used so, and then, they say, the Fruit of the new-made Tree is without Kernels.

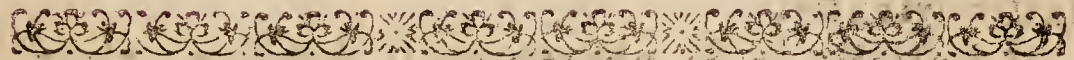
A Fryar has promised to graff me this Season the Carnation upon Fennel; he says, the Flower will be entirely green, as well as the Plant; and he assures me, the Colour will keep two or three Years the same, and after that, changes to the Colours common to that Flower: He adds, that in this Country the best Stock for graffing Stone Fruit upon, is the Peach, for its Flavour is communicated into the Fruit of the Graff; as likewise, if you graff a Peach upon a Mulberry, the Fruit will

will have the Purple Dye to the Stone, and the pleasant acid Flavour. If I can make any Observations here worth your Notice, I shall communicate them to you with Pleasure. The Natives are the least curious in Gardening of any Nation in *Europe*: Any thing uncommon is in the Convents, where they seldom Part with it.

I am, Sir,

Your most Humble Servant,

John Clarke.



Considerations upon Captain Cumberland's Invention for softening and making Timber plyable, as it is practis'd in his Majesty's Yard for Ship-building, whereby the most rude and crooked Timbers may be made straight, or Planks of any thickness may be brought to the Bow.

WHAT I have already mention'd in this Piece, relating to the Planting and Improvement of Timber, seems to command the following Observations concerning the Use of it.

Having lately, in a particular Manner, taken a Tour about several of the Royal Docks for building of Ships, as well as some more private ones, I had the Curiosity to observe the ingenious Contrivance of Captain *Cumberland*, for bending of Plank and Timber by Sand-heats, which he has now brought to so great a Perfection, that even Pieces of ten Inches thick, by two Foot broad, can be brought to any Bow in such a Manner, as to preserve all its primitive Strength; and also crooked and surly Sticks of Timber of far greater Bigness, made straight by the same Means.

I believe it is pretty well known, that the Methods which have been used to bring Planks for Shipping, &c. to the Bow, has been done by burning, before the Captain's Invention took Place; and not only was that bending of Plank by burning, brought about by expensive Firing, but by expensive Attendance; and then, when all was done, the Strength of such Planks was greatly impoverish'd, for by such Burning, many of the binding Vessels of the Wood were broken, and became of no Service. Again, I observ'd, that large Scantlings of Timber could not be brought to bend by burning, so that the Workmen in such Cases were forced to have recourse to compass Timber, or to cutting out a Bow, or an Arch,

out of a Solid Piece of Timber, at more than double the Expence it would have been if they could have bent a solid Piece to their Bow, of which the following Example is a Proof.

One Piece of Compass Timber containing 100 Foot, makes but one Harpin of ten Inches thick for a first Rate Man of War; but by Captain *Cumberland's* Method, a Piece of straight Timber, containing only 95 Foot, made two Harpins of the like Substance, and one Piece of 5 Inches thick for the said Ship; which Difference is very considerable, if we consider that the 100 Foot Compass-Timber, *i. e.* two Load, worth 3*l.* 10*s.* per Load, is 7*l.* for one Harpin; and that by the Captain's Method, we have two Harpins of the like Sort, besides a Piece of 5 Inches, for 5*l.* 15*s.* or 95 Foot, after the Rate of 3*l.* per Load.

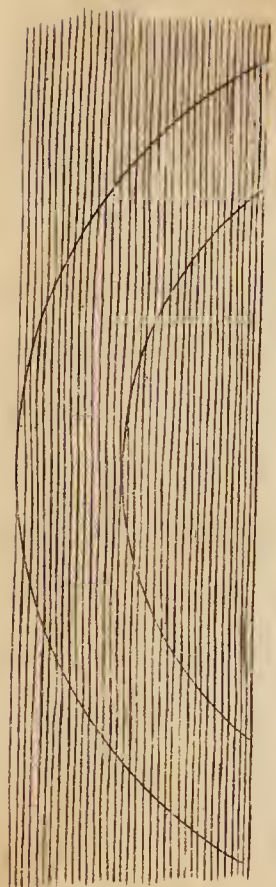
The bending of Timber by the Captain's Method of Sand-Heats, has yet this Advantage in it, that it seasons the Timber, by exhaling or drawing from it all the watery or aqueous Parts, as is evident from the Sands being discolour'd, when the Timbers are come to a right bending State; and these watery Parts, every one knows, are the first Occasion, as well of the rotting as of the shrinking of Timber; which last is in a particular Manner so well understood, that every one seeks for
well.

well seasoned Timber, and is content to pay considerably more for it, as it prevents a second Trouble in building, by rejoining of Parts, which in unseason'd Planks or Boards, are apt to fly asunder. Nor is this all the Good we are to expect from well seasoned Timber, or Planks, or Boards; for besides the exhaling of the Watery Parts, we preserve the Resinous or Gum-like Juices in the Wood, pure and unmix'd, which tend to preserve the Wood, and prevent Rottenness.

One Thing which pleas'd me extremely in this Way was, the straightning of a Piece of Timber 50 Foot long, which squared at the Butt about two Foot, and at the Top about 18 Inches. It was much like *Fig. I.* in Shape, but notwithstanding its crooked Form, and its extraordinary Contents, when it was saw'd through lengthways, and had been put in the Sand-Heat, being then placed upon a flat Piece of Timber, and braced down with Ropes, was afterwards with Wedges brought to be perfectly straight. This I think will be of great Use, considering how much of this uneven Timber we have in *England*, and how much has been cut to Loss, for want of such reconciling Means.

Since I have observed these Things, I cannot help taking Notice *en passant*, that this Way would be of extraordinary Use in building of *Cupola's*, and every Thing where

A



B

*Fig.
III.*

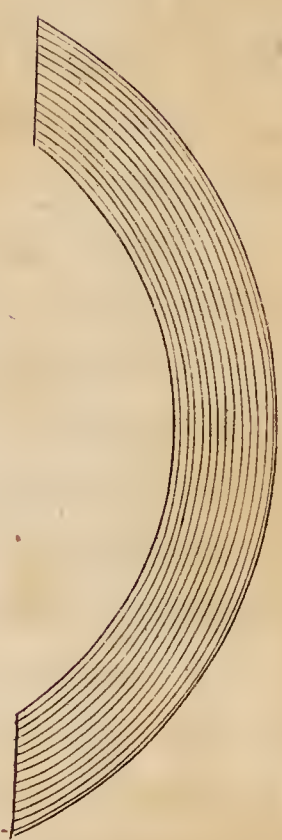
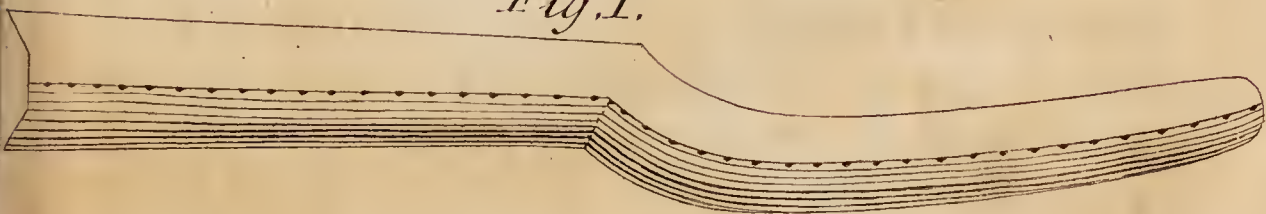


Fig. I.



*Fig.
I.*

where Compass Work is requir'd, and even in the making of Wheels; which last might have the Part call'd the Nave made of two Pieces only, this bended Timber carrying a great deal more Strength in it, than any that is cut out of solid Pieces; besides what may be saved by this Means, which will be very considerable.

But that we may have the better Idea of what I say, relating to the superiour Strength of the bended Timber, we may observe the following Particulars.

First, That all Timber is compos'd of two Sorts of Vessels, *viz.* those which run lengthways through the Body of it, and others which are interwoven among them, of a more tender Nature, that run cross-ways. The first are like those Strings which remain in Flax or Hemp after they are dress'd, wherein is the Strength of the Plant; the other is compos'd of those Vessels which are beaten off, when the Hemp or Flax is pounded; and these two Sorts of Vessels are found in all Plants whatever; so that the first Sort of Vessels, *viz.* the long ones, are to be preserv'd as much as possible for the Strength of Timber. The *Fig. II.* shews by many straight Lines running from A to B, the long Vessels which I speak of, which as long as they remain entire, and together, are like the Bundle of Rods in the Fable, not to be broken; but let any one judge, wher

when many of these Strings are cut, as appears by the Compass-work mark'd out between A and B. whether the Arch to be cut out of such a Piece of Wood, would not be very weak, in Comparison of a Piece of Wood bent as I have mention'd, or as we may observe in *Fig. III.* where we may see these Vessels of Strength reaching quite through the Piece which is bent to an Arch; surely then, such an Arch, when it does perish, must decay all at once, because all Parts are alike in Strength; and considering how much the Lives of great Numbers of Men depend upon the Strength of those Ships they go to Sea in, the strongest Way of building Ships is to be preferr'd. But there are two Objections to this bending of Timber; the first is, That it will not always stand bent to the Bow we first bring it to. But we find no Reason for such an Objection, because that we find large Pieces of such bent Timber that have only been confin'd 'till they have been cold, have then had their Braces taken off, and they continu'd perfectly bent, as they were when they were braced without the least Guard to keep them from flying out: The Reason is, because, as I observ'd before, there remains only the Resinous Juices in the Timber, after it is heated to the Purpose; so those Juices, which harden extremely when the Wood comes to
be

be cold, cannot give Way again, 'till they are melted, or made fluid, by an Heat equal to that which disposed the Timber first to be bent. 'Tis as if we were to dip a Piece of Rope in melted Rozin, which will bend while the Rozin is warm; but when once it is throughly cold, it becomes stiff and hard, and cannot be resolved into its first Capacity of easy bending, 'till the Rozin is again warm'd, and becomes fluid.

The second Objection is, That by bending of Timber, these Vessels, which I say support the Strength of it, are some strain'd, and some broken, and that there are none of them left in the Strength they had before. If it were so, how is it then, that in laying down Branches of Trees in the Ground to take Root, which bend them much more than I have mention'd: How then does it happen, that these Branches grow in all their Parts, as well as they did before we bent them; or if we bend the young Twigs of a Tree so much as to tye them in Knots, even then they do not refrain their Growth; and it is every where allow'd, that the Vessels we speak of, convey Sap to every Part of the Tree, and if they were broken, the Current of the Sap must be stopp'd, and all Growth must cease; so it is evident, these Vessels are neither broken nor weaken'd.

I have

I have only to add, that of all the Experiments concerning the saving of Timber, and rightly applying it to Use, I know none which ever contributed so much to the good of our Country; for in the Affair of Ship-building only, where the bending of one Plant used to employ four or five Men an whole Day, besides a great deal of Expence in Firing; by Captain *Cumberland's* Method, 16 Planks can be bent in a Day by two Men, with less Expence of Firing than one single Plank used to do before; besides preserving it of its full Thickness, and square Edge, which is of very great Advantage in the Cauking of Ships.



To William Parker of Healing, Esq; concerning the Culture of Foreign Plants in England.

S I R,

WHEN I had the Pleasure of seeing your curious Garden at *Healing*, I observ'd so many foreign Plants which were naturalized to our Climate, that I could not help reflecting how useful an Example your Method might be to the Gentlemen of our Country, who
above

above all others, have Opportunity of trading to foreign Parts, and especially to *America*, where abundance of useful and profitable Trees and Plants are Natives. In *Mary-Land, Virginia, and Carolina* we have discover'd many Plants which the late Dutchess of *Beaufort*, the late Dr. *Compton* Bishop of *London*, *Samuel Reynardson*, Esq; and some other Virtuosi of the first Rank, made familiar to the *English* Climate: But hitherto no Gentleman has attempted to dispose of so great Varieties of foreign Plants in the open Air, with so good Success as you have done. I remember an Observation you was so kind to acquaint me with, which I think very extraordinary, *viz.* that among your Experiments in setting foreign Trees abroad in your Garden, you found that such Plants as had Resinous Juices, would bear our Winters, tho' they were Natives of much warmer Climates than any I have mention'd; and indeed there are Witnesses enough in your Garden of that Sort. If we were to follow this Example rightly, I suppose in a few Years our Woods and Groves would be adorn'd with many rich and useful Trees, which at present, through the Fear we have of venturing such Curiosities abroad, are hardly esteem'd worthy our Notice, or at least neglected as useless Things in our Climate; for tho' we can, with the great-
est

est facility preserve them during the Winter Season in Houses, yet, as the *End* of the Trees I mean, is chiefly to make good Timber, or to yield some Benefit from their Berries, or Fruits, which they will not produce 'till they are of a much larger Size than we can manage in a House; so it has been hardly thought worth our while to cultivate them at all, considering the great Expence we must be at to no purpose, but for the Sake of Curiosity only. I hope however, the Example you have now set us, will overcome these Difficulties. Indeed, that Houses of Shelter are necessary to preserve such Plants during the Winters, for the first two or three Years, 'till they have got Strength, is undeniable; and as soon as they come to such a State, as to be a little acquainted with our Climate by being harden'd by Degrees, to set them abroad in Groves as you have done, is as necessary; and they will then thrive apace, and give us not only the Pleasure of observing their Variety, but also give us a promising Prospect of receiving Benefit from them. The *Ilex*, tho' the Value of its Timber has for a long Time been well known, besides its being a most beautiful Evergreen. Yet, tho' we have had Examples of 40 Years standing, that it would prosper well in the open Air of our Climate, very few or none have offer'd to cultivate it in any
Quantity

Quantity with us, 'till I enter'd upon it; and since that Time, which is within the Compass of six Years, many Millions of them have been raised here from Acorns brought from *Italy*, *Spain*, and *Virginia*, as well as great Numbers of *Cork Trees*, which grow very well with us. But if there are some Trees abroad, in the Climates I speak of, whose Virtues are not yet known; my Opinion is, that even those should not be neglected; for as there was nothing created in vain, so I suppose that these will some Time or other discover themselves to be of use, as well as those have done which are now useful to us. The *Acer Majus*, or Great Maple, vulgarly call'd the Sycamore, has been esteem'd of no use, 'till a very ingenious Gentleman, Mr. *Collinson*, in his Travels through *Wales*, observ'd it grow well, and make an excellent Tree of Defence against the powerful West Winds: But you will see more of it in his Letter to me, which I shall soon publish, with other curious Observations and Experiments. But since the Arrival of your Coffee-Trees, and the great Design you are carrying on, of bringing forward the delicious Fruits of the warmer Parts of the World, by Stoves, or Hot-houses, I shall, in Obedience to your Commands, give you an Account of the Management of the Coffee-Trees, as I observ'd it at the

Phyſick-Garden at *Amſterdam*; and I ſhall add to it ſome Remarks I have got together concerning the Spring-Seasons in the ſeveral Climates of the World, to ſave you the Trouble of calculating in particular for every Plant you receive from abroad; for without that be done, we may give our Plants Heat at a wrong Season, and weaken them, perhaps, beyond recovery.

The Coffee-Trees at *Amſterdam*, which proſper ſo well there, that they bring Bloſſoms, and ripen Fruit every Year, are kept conſtantly in a Glaſs-Caſe, which, as near as I can gueſs, is about 15 Foot long, and about 12 Foot wide, the Height about 20 Foot, the Front is all Glaſs; under the Floor is an Oven for Fire, which leads into Flues; that after their Paſſage here and there, end in a Chimney as our other Stoves do. They uſe no Tan-ners Bark in this Houſe, nor give the Plants any Air all the Summer, but thro' little Caſements about a Foot ſquare, placed about the Middle of the great Windows or Pannels of Glaſs; and even theſe little Caſements are ſeldom open'd, becauſe there is a Door, which opens out of this Glaſs-Caſe into a large Green-houſe, which they commonly keep open in the Summer Time.

It is a Cuſtom there likewise, twice or thrice in a Summer to clean the Leaves
of

of the Plants with wet Sponges, which takes off the Dust that stops the Pores of the Leaves ; and I look upon this to be of considerable Use, because I suppose the Leaves receive some Nourishment from the Air, which circulates about them, and consequently the whole Plant is benefited by it.

I observed that the Gardener there gave them frequent Waterings, a little at a Time, and their Earth was very light ; but especially the Summer when the green Fruit was toward ripening, he gave them more Water than at other Times, *i. e.* in *June*. It is observable, that when the Fruit is ripe about the Beginning of *July*, it must be gather'd, and immediately the Seeds must be clear'd from the Pulp, and set in the Ground, otherwise they will not sprout : This particularly the Gardener at *Amsterdam*, *Mr. Cornelius*, observes diligently ; and tho' I sent some Berries fresh gather'd, by the Post, which were not above four Days in the Passage to *London*, to a very great Artist, they could not be made to grow ; therefore, I think it much the best Way to have the Coffee-Seeds you expect, come over in Earth, by Way of *Rotterdam*, or *Helvoet-Sluis*, which will be much sooner with you than by Way of the *Texel* from *Amsterdam* ; for sometimes I have known a Ship has been two Months in the Passage from *Amsterdam*

dam to *London*, by Way of the *Texel*, and the Seeds would be quite spoil'd in that Time, for in the natural Earth only, I have seen some Coffee Plants above Ground within three Weeks after the Seed was put into the Ground. And so the Cocoa-Nuts, of which the Chocolate is made, should be either raised in Cases in the Countries where they grow, or else the Nuts planted in those Places a due Depth in Boxes of Earth, so that they may come up in the Passage, if it is their Nature to be quickly hatch'd, or appear above Ground, or otherwise we must not expect them to do any good with us; for I am told, that in the very Country where they ripen, they will not grow if they are kept out of the Ground three or four Days after they are gather'd. What I say of the Coffee-Berries being spoil'd by being so long in Earth as two Months from *Amsterdam* to *London*, will only happen if they were to be put promiscuously into a Body of Earth, not if they were planted an Inch or two deep in it.

As for the Time of making the Fires in the Stoves, they begin in *October*, and continue it constantly, 'till the Weather is warm enough in the Spring for the Plant; I suppose this continu'd Fire in the Stoves is necessary to continue the Growth of the Plants, when the Juices are once flowing; for to warm the House

one

one Day, and let it cool the next, will certainly check the Growth of a Plant; and this Method, which we have taken too often in our *English* Green-houses, has, in my Opinion, greatly contributed to destroy many a good Plant. And then again, the Practice which has been so common with us, to set Plants of all Climates together in one House, and give them all Heat at the same Time, has been another Means of destroying Plants; but as your Stove is contriv'd in such a Manner, as to be separated one Part from the other, by a Partition; so I judge, your Heat may be govern'd so as not to be every where at the same Time alike, and therefore may bring Plants of different Climates to perfection.

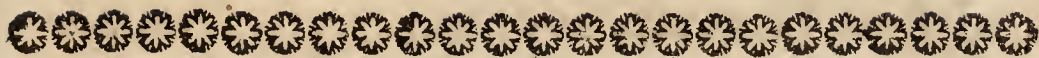
The Gardener of the *Amsterdam* Gardens seems to have some Regard to this, as I observe from his dividing his Stoves into many Parts; and I find in each, only the Plants which come from one Country.

The Coffee-Tree, which grows naturally in the Kingdom of *Yaiman* in *Arabia Foelix*, is found from the Latitude of 18 to 20 Degrees North; and the *Dutch* now have it growing at *Batavia*, 7 Deg. South Latitude, and at *Surinam*, 8 Deg. North. So I doubt not but in any of our Settlements between the Tropics, we might have Coffee in as great Perfection as in its

Native Country ; and even towards the Southermost Parts of *Carolina* ; for it is experienced in your Garden near *Croydon*, which is near the same Latitude with *London*, viz. 52 Deg. and $\frac{1}{2}$ North Latitude, the ordinary Plants of Countries above 16 Degrees more Southward, thrive very well, without Shelter ; so that I see no Room to doubt of the good Success of the Coffee-Tree, if it is only mov'd 10 or 11 Degrees more North than its Native Place, especially since both *Taiman* and *Carolina* are North Latitude, and consequently the Time of the Sun's Progress towards them is the same, tho' the Spring of the first is a little sooner than the other ; I yet am of Opinion, that the Places which lie without the Tropics only five or six Degrees, have always Warmth enough to keep Plants that grow naturally about five or six Degrees within the Tropics.

This being all I can remember of the Coffee-Tree, and its Culture in the Gardens at *Amsterdam*, I shall proceed to give you a List of all the principal Places Names, from whence we may expect to receive Plants, and mark to each of them their Degree of Latitude, whether North or South, which I shall think very well worth my while to have put in the Order you will find it, if it may prove useful to you.

Alphabetical



*Alphabetical LIST of the
Names of Places in the several Parts
of the World, with their Degrees of
Latitude, &c.*

A

- Acadia*, from 49 to 45 North.
Azores Isles, from 39 to 37 North.
Algiers, and the greatest Part of *Barbary*
Coast, from 37 to 35 North.
Alexandria, 31 North.
Aden, 12 North.
Amboina, 3 South.
Antegoa, 17 North.
Amazons Country, from 18 South to the
Line.
Angola, 11 South.

B

- Buenos Aires*, 35 South.
Barbadoes Isle, 13 North.
Brazil, from 35 South to the Line.
Bermudas, 33 North.
Bakama Isles, from 28 to 22 North.
Bayador, 26 North.
Bysagos, 11 North.
Baudera Bashee in the South of *Persia*, 28
North.

- Borneo Isles, from 6 North to the Line,
and two Degrees South.
Banda, the Nutmeg Island, 4 South.
Bencola, 4 South.
Batavia, 7 South.
Bombay, 19 North.
Bengale, 23 North.

C

- Canada, from 50 to 38 North.
Carolina (North) from 36 to 33 North.
Carolina (South) from 33 to 30 North.
California, from 44 to 23 $\frac{1}{2}$ North.
Cuba, from 22 to 19 North.
Caribbee Islands, from 20 to 10 North.
Cape Verd Islands, from 18 to 12 North.
Canary Islands, from 30 to 28 North.
Corsica, 42 North.
Candia, 35 North.
Cyprus, 35 North.
Cambaya, 23 North.
Cormandel, from 16 to 8 North.
Camboyda, 14 North.
Ceylan, from 10 to 6 North.
Conchinchina, from 20 to 10 North.
China, from 41 to 20 North.
Chusan, 30 North.
Ceram Isle, 3 South.
Curasan Isle, 12 North.
Carthagena, 11 North.
Cape Horn, 64 South.
Chiloa Isles, 42 South.
Chili from 44 to 24 South.
Cape St. Augustin, 8 South.

- Cape Frio, 23 South.
 Cape of Good Hope, or Cape Bona Esperanza, 34 South.
 Cafres, 25 South.
 Congo, 7 South.

F

- Florida, from 38 to 24 North.
 France, from 50 to 42 & $\frac{1}{2}$ North.
 Fort Ventura, 28 North.
 Formosa Isle, from 25 to 22 North.
 Fort St. David, 12 North.
 Fort St. George, 13 North.
 Ferdinand Isles, 33 South.

G

- Gibraltar, 36 North.
 Greece, from 41 to 36 North.
 Guinea (Upper) from 18 North to the Line.
 Gambia, 13 North.
 Gold Coast in Guinea, 8 North.
 Golconda, 18 North.
 Gombroon, 27 North.
 Guinea (Lower) from 17 South to 3 North.

H

- Hispaniola, from 20 to 18 & $\frac{1}{2}$ North.
 Honduras Bay, from 20 to 17 North.
 Hungary, from 50 to 46 North.
 Horn Cape, 64 South.
 Hottentots Country, from 34 to 30 South.

I

- Jamaica, 18 North.
 Italy, from 45 to 39 North.
 Ispahan in Persia, 33 North.

Japor

Japon or *Japan Isles*, from 40 to 20 North.
Java from 8 to 6 South.

L

Lisbon, 39 North.

Lima, 11 South.

M

Mona Isle, famous for odd Plants, 15 Nor.

Molucca Isles, from 10 South to 3 North.

Macascar, from 5 South to 1 North.

Madagascar, from 26 to 11 South.

Mosambique, 14 South.

Maryland, 39 North.

Mexico (New) from 38 to 28 North.

Mexico, from 28 to 16 North.

Madera Isles, 32 North.

Minorca, 40 North.

Majorca, 40 North.

Morocco, 32 North.

Malaca, from 10 North to 1 South.

Mindanao, from 9 to 7 North.

Mogodor, 35 North.

Malabar, from 12 to 3 North.

Mindoro, 13 North.

Maldiva Isles, from 8 North to 3 South.

Madura Isle, 7 South.

Montabay, 2 South.

Mississippi River Mouth, 28 North.

Montserrat, 16 North.

Magellan, from 54 to 34 South.

Mataman, 18 South.

Monomotapa, 17 South.

N

Newfoundland, from 50 to 48 North.

New-

New-England, from 44 to 40 North.

New-York, from 41 to 40 North.

New-Spain, from 17 to 7 North.

Naples, 41 North.

Nankin, 32 North.

Nicobar Isles, 9 North.

Nevis Isle, 17 North.

O

Oroonoco River Mouth, 9 North.

Oporto, 41 $\frac{1}{2}$ North.

P

Pensilvania, 40 North.

Portugal, from 42 to 37 North.

Pegu, 18 North.

Paragoa, 10 North.

Phillipine Isles (New) from 11 North to the Line.

Phillipine Isles, from 18 to 9 North.

Pekin, 40 North.

Porto Bello, 10 North.

Paraguai, from 37 to 18 South.

Peru, from 24 South to 1 North.

Porto Figuro, 16 South.

R

Rio de la Plata, 35 South.

Rio Geneiro, 23 South.

S

St. Helena, 15 $\frac{1}{2}$ South.

St. Sabastian, 22 South.

St. Salvador, 12 South.

St. Domingo, 33 South.

Surinam, 8 North.

Spain, from 43 to 36 North.

Sardinia

Sardinia, from 40 to 39 North.

Sicily, from 39 to 38 North.

Scanderone, 36 $\frac{1}{2}$ North.

St. Thomas Isle, under the Line.

Surat, 20 North.

Sumatra, under the Line.

Smyrna, 38 North.

Socotra Isle, 13 North.

Soler Isles, about 7 South.

Siam, 15 North.

St. Christophers, 17 North.

T

Toulon, 43 North.

Tripoli, 32 North.

Turkey in Europe, from 48 to 41 North.

Ternate, the Island where the Clove-Trees grow, 2 North.

Timor Isle, 9 South.

Trinidad Isle, 10 North.

Terra del Fuogo, from 56 to 54 South.

V

Virginia, 37 North,

Vera Cruz, in *Campeche Bay*, 18 North.

Ventura Forte, 28 North.

Visapour, 17 North.

Vera Cruz, in the *Amazons Country*, under the Line.

Y

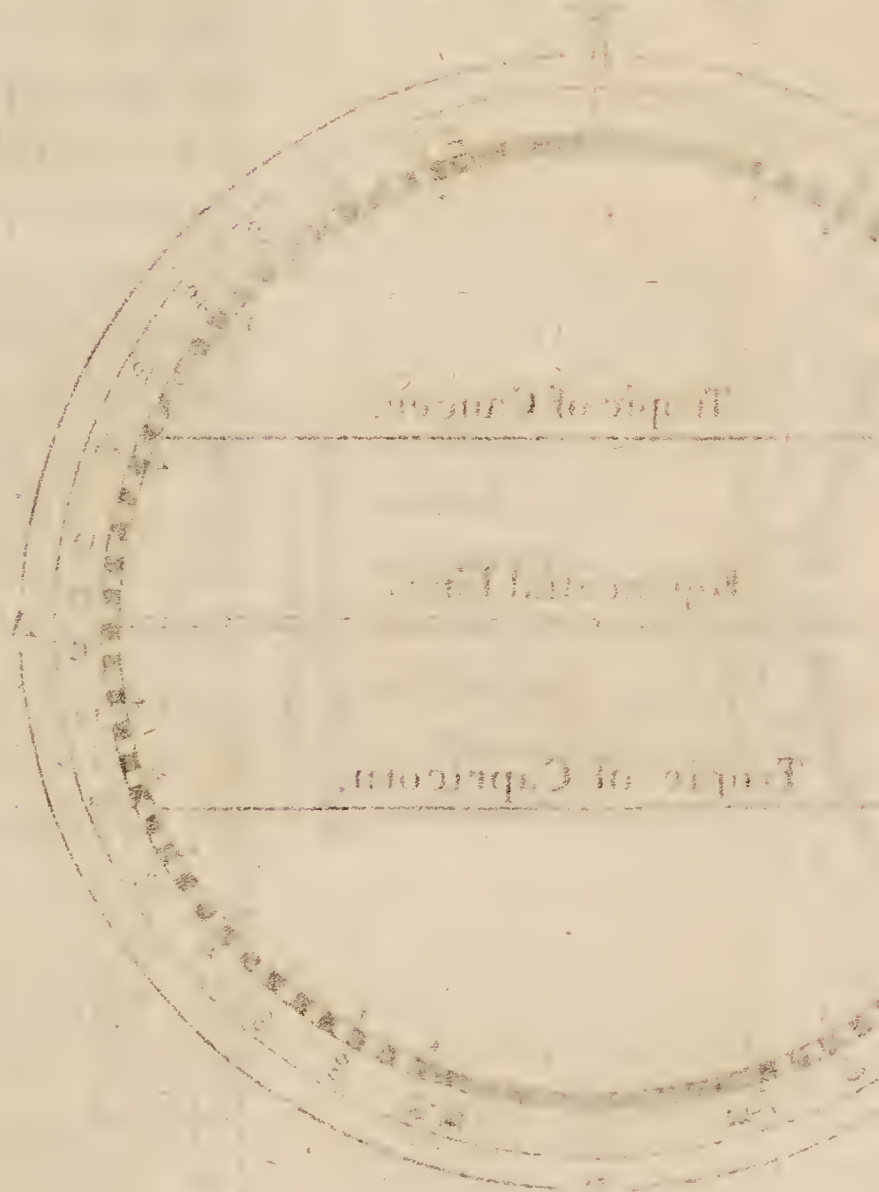
Yaiman in *Arabia Felix*, the Coffee Country, 20 North.

Z

Zanguebar, from 16 South to the Line.

And

North Pole



Equinoctial Line

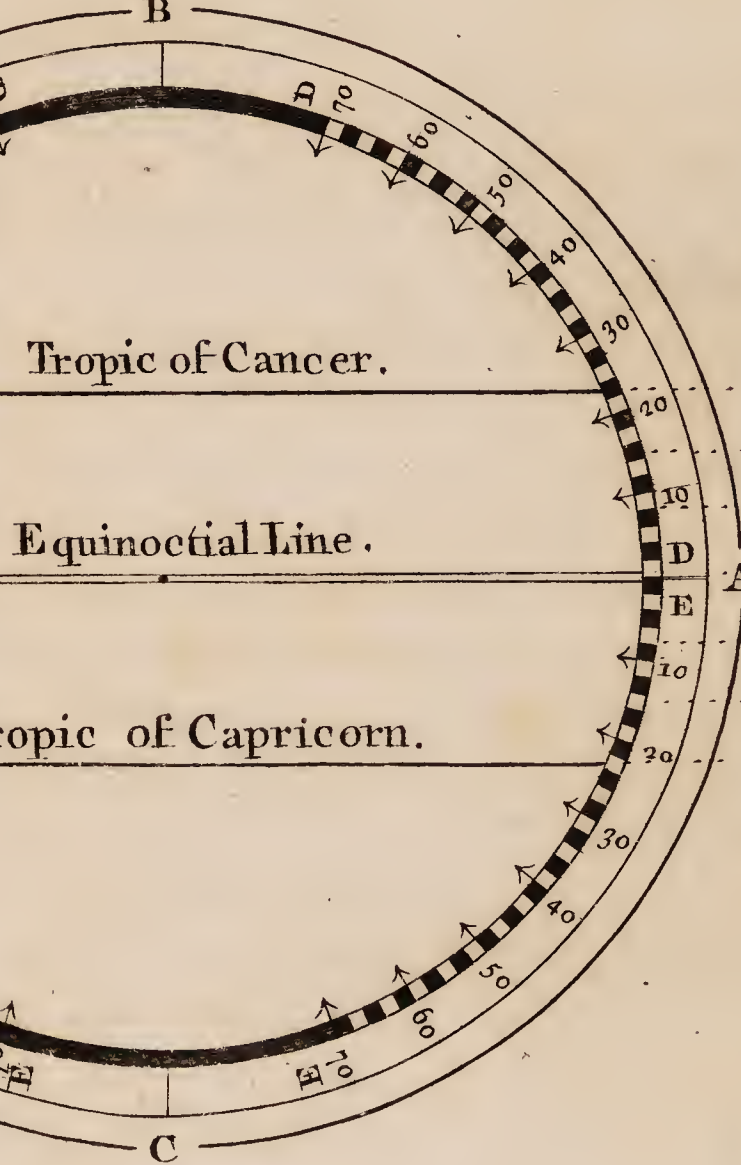
Tropic of Cancer

Tropic of Capricorn

South Pole

The
 Equinoctial
 Line
 Tropic of
 Cancer
 Tropic of
 Capricorn
 North Pole
 South Pole

North Pole.



Tropic of Cancer.

Equinoctial Line.

Tropic of Capricorn.

South Pole.

*Sun's course to the south
or from Britain.*

- 11. June.
- 11. July.
- 11. August.
- 11. Septem^r.
- 11. October.
- 11. Novem^r.
- 11. Decem^r.

- June, 11.
- May, 11.
- April, 11.
- March, 11.
- Febru^y, 11.
- Jany^r, 11.
- Decemb^r, 11.

Sun's course to the North

And now, Sir, that I have given you an Account of the Latitudes of Places, I think it may not be amiss to send you likewise the following Meinorandums, for the Use of your Gardeners, that they may better understand the Use of the foregoing List of Names, by knowing at what Seasons the Sun is nearest to any particular Place, and in what Months farthest from it, that the Fires may be regulated accordingly. The Figure annex'd represents the Globe, with the Equinoctial Line, and the two Tropics; whereby they will find that the Extent of the Sun's Progress is 47 Degrees from the Tropic of *Cancer* to the Tropic of *Capricorn*; and that the Sun has its Course from Tropic to Tropic twice every Year: I think it proper, as I now talk to Gardeners, who perhaps have not had the Opportunity of any great Share of Learning, to treat them upon this Head in the most easy and familiar Way, and talk of the Sun's Motion backwards and forwards, which they generally believe, rather than to perplex them with speaking of the Earth's Motion, which they, perhaps, cannot comprehend.

From A. A. to B. in the Figure, is North Latitude.

From A. A. to C. is South Latitude.

From D. to D. we shall find the Degrees of North Latitude mark'd 10, 20, 30, 40,
50,

50, which is near the Southermost Part of *England*, *London* is $52 \text{ \& } \frac{1}{2}$ Degrees.

From E. E. we find the Degrees of South Latitude mark'd 10, 20, 30, 40, &c.

Every Division in that Circle of Degrees, whether it is mark'd Black or White, is two Degrees, or 120 Miles.

The Sun is upon the Line *March* 11, and also upon the same Line *September* 10; so that at either of those Times the Sun's Influence is equal on both Sides the Line: All the South Latitudes have the same Share of it as the North Latitudes.

The Sun is at the Tropic of *Cancer*, *June* 11, which is the utmost Extent of its Course Northward: This Tropic is 23 Degrees and $\frac{1}{2}$ North of the Line, which, reckoning 60 Miles to each Degree, is 1410 Miles between the Tropic and the Line, which is the Progress of the Sun in 13 Weeks, or a Quarter of a Year; so that in the Sun's Course from the Tropic of *Cancer* to the Line, it retreats 15 and $\frac{1}{2}$ Miles every Day, or about 108 Miles *per* Week; which in a Month of 30 Days is 463 Miles or upwards, or above 7 Degrees and $\frac{1}{2}$.

For the better Explaining of this, see the following Remarks.

June 11, the Sun in the Tropic of *Cancer*, or 23 Degrees and $\frac{1}{2}$ North Latitude.

July about the 11th, the Sun about 16 Degrees North Latitude.

August

August about the same Day, about 8 Degrees North Latitude.

September about the 11th, upon the Line.

October about the same Day, about 8 Degrees South Latitude.

November about the same Day, near 16 Degrees South Latitude.

December about the same Time, the Sun in the Tropic of *Capricorn*, its farthest Bounds to the Southward.

January about the same Day, it has return'd or come nearer to us about 8 Degrees, and is then near 16 Degrees South Latitude.

February about the same Day, the Sun is about 8 Degrees South Latitude.

March about the same Day, the Sun is returned to the Line.

April about the same Day, the Sun is advanced to about 8 Degrees North Latitude.

May about the same Day, the Sun is advanced to about 16 Degrees North Latitude.

From this and the Figure, any one may easily find out in what Latitude the Sun is in every Month, and how it approaches or goes farther off the native Country of the Plants we design to cultivate; for Example, If we were to keep the Nutmeg-Tree, let us look for *Banda* in the foregoing Catalogue, and we shall find it in 4 Degrees South; then see in the Figure
the

the Months when the Sun is nearest that Place, which we shall find *September* and *October*, and *January* and *February*; in these Months we must keep Fires in our Stoves, at least up to the Pine-Apple Heat in Mr. *Fowler's* Thermometers, which may be had at his Shop in *Switbin's-Alley* by the *Royal-Exchange*; and so indeed the Fires must be still kept on from the first lighting in *September*, 'till we may place them in a Glass-Cafe in *Tanners Bark*, which may begin about the Middle of *April*, and last 'till the Time we begin to make Fires again in *September*; for we must consider, that Places so near the Line are always very much under the Sun's Influence, tho' more at some Times than others: So when such Plants are with us, we should only give them Air directly from abroad in our hottest Days of Summer.

Suppose in the next Place, we were to propagate the Tea which grows in *China*; let us look for *China* in the foregoing Catalogue, and we shall find it extend from 41 to 20 North Latitude. I shall suppose that the Tea grows about the Middle of the Country, which is 30 Degrees North, or about the same Latitude with *South Carolina*; then as we have Plants from the South Parts of *Carolina*, which after a little Care to harden them, will stand abroad with us, I make no Doubt but the

China

China Tea, which appears to grow about 30 Degrees North, may be easily propagated with us ; but especially would prosper exceeding well, to be planted in *South Carolina*, from whence we might soon bring large Quantities, if it was once planted there, and make three or four Returns for one *China* Voyage : But as to the propagating of it in *England*, if we were to give it Shelter in the Winter, we may see by the Figure, that the Summers in *China* are only a little earlier than with us, and the Winters are of course much about the same Time ; besides, as 30 Degrees are out of the Tropics, there need not be any artificial Heat apply'd, nor any other Care taken to preserve the Tea with us, but to give it some little Shelter in extreme Frosty Weather, and it is a Quere whether even that be necessary or not ; for we must be careful not to give Heat to a Plant that does not require it : We have Experienced in the propagating of the Caper ; we used to put it into our warmest Stoves, and took a great deal of Pains with it to no Purpose, 'till I sow'd it in some old Walls, and gave it the free Air, and then it answer'd the End of bearing Flowers as well as it does at *Toulon*.

While I am speaking of transplanting these Riches from one Place to another, I cannot help wondering that the *Cochinele*,

N

which

which is plainly an Insect, is not industriously propagated in our *West-Indian* Settlements; seeing it might be done only by transplanting one of the Sort of *Opuntia's* whereon this Insect has laid its Eggs, that alone would soon fill a Country with it, as well as the Plant necessary for it to feed upon.

For a third Example, let us consider *Barbadoes*, whose Latitude is 13 North, whether or not the Sun in its greatest Distance from it, be more than the Sun is from *England* in the longest Day? We shall find by the Figure, that at the shortest Day with us, the Sun is distant from *Barbadoes* 36 and $\frac{1}{2}$ Degrees; but in our longest Day the Sun is only distant from us 29 Degrees, which is 7 Degrees and $\frac{1}{2}$ that the Sun is then nearer to us than it is to *Barbadoes* at our shortest Day; I have heard that the Nutmeg-Tree was once in *Barbadoes*, and prosper'd very well; and I see no Reason why we may not try it in that Island once more, or at least the Cinnamon, which now grows in *Ceylon*, whose Latitude is from 10 to 6 North.

Considering the Latitude of *Jamaica*, which is 18 North, no Place could better fit the Coffee-Tree than this; so the most Southward of the *Caribbee* Islands would do very well for the Pepper, Clove-Trees, and any of the Spices, for the Nutmeg grows in 4 Degrees North, the Cloves
in

in the Island *Ternata* 2 Degrees North, the Pepper in *Borneo* 6 Degrees North, as well as under the Line, and the Cinnamon at *Ceylon* from 10 to 6 North; so I doubt not but they will all do well in the South of the Caribbee Isles, which lie in 10 Degrees North, for even 10 Degrees difference between the Tropics, is of little Import to Plants which are Natives of the Torrid Zone.

There is one Example more I think necessary to offer, and that is, if we receive Plants from the *Cape of good Hope*, we shall, if we look into the Table, find its Latitude to be 34 Degrees South, then if we look into the Figure we may see that the Cape is near 11 Degrees beyond the Tropic of *Capricorn*, and we may suppose has much the same Influence of the Sun, when the Sun is in the Tropic of *Capricorn*, that *Gibraltar* has from the Sun when it is in the Tropic of *Cancer*: For *Gibraltar* is in 36 North, as the Cape is 34 South; their Winters and Summers are directly opposite, and that is chiefly what we have to regard in the Management of the Cape Plants, we must give them what Encouragement they have in the Months *November, December, January, and February*; for the Figure shews us the Sun is nearest to the Cape in those Months; and indeed the Plants themselves shew it us in their Attempts of flow'ring at those Seasons:

But we must not suppose that all the Plants we receive from the Cape, are Natives of that Place; for there are many Sorts of Plants cultivated at the Cape, which are Plants of other Countries, so we must use some Caution in this Affair.

In the Figure we may observe, that in the Month of *May* the Sun is just as near us as it is in *July*, and in *April* as it is in *August*, in *March* as in *September*; and yet tho' the Sun is equidistant from us in *July* and *May*, we find that the Heat of *July* is far superior to that of *May*, which I suppose happens because the Sun has had more Time to warm the Earth on our Side, and consequently the Body of Air; but I think I have said enough upon this Head to render my Scheme intelligible, and shall only add, that it is my Wish, that every one who goes abroad to the Countries where those extraordinary Plants are, which I have mention'd, would be industrious to bring them to us, that in due Time they may be render'd useful. I cannot suppose, indeed, that a Ship will put so far out of her Way, upon her Return from an Eastern Voyage, as to leave Plants at any of our Settlements in *America*; but let the Plants be brought to *England*, there to be kept 'till a proper Opportunity offers to send them to the Places design'd for 'em; the new Stoves that are lately built will preserve them,
if

if such Instructions as these be follow'd, let them come from what Latitude they will: Nor let any one despair of Success, tho' they have not Stoves immediately of their own to put the Plants into, which they bring over, so long as there is such a Garden as Mr. *Fairchild's* at *Hoxton*, near *London*, where such Things may be immediately taken care of, and manag'd with Skill.

I remain, Good Sir,

Your most Humble Servant,

Richard Bradley.



To Mr. Bradley.

S I R,

According to your Desire, I send you a Catalogue of such curious Flowers as blow in my Garden from *July*, to compleat the Year.

I am,

Your Humble Servant,

Tho. Fairchild.

Stock Gilly-Flowers, double and single, white and red, purple and white, Tree Scabius, Musk Scabius, *Turky* Scabius, *Fairchild's* Mule, Valerian white and red, six Sorts of Viola Tricolor, *Spanish* Broom, *Virginia* Martagon, two Sorts of Goat Rue, horned Poppy, *Spanish* Jessamine single and double, *Brazil* Jessamine, *Indian* yellow Jessamine, *Arabian* Jessamine, Ilex-leav'd Jessamine, *Virginian* yellow Jessamine, Linconium, several Sorts of Ficoides, Aloes several Sorts, Corn Marigold white and yellow, two Sorts of Anemone Spermios, Amomum *Plinii*, white flower'd Nightshade, double and single Virgin's Bower, double and single flower'd Myrtle, five Sorts of Sun-Flowers, four Sorts of Gnaphaliums, Holyoaks, four Sorts of Apocinums, Campanula two Sorts, Oleanthers four Sorts, Thorn Daisie scarlet and blue, Cardinal Flowers, Orpine white and red, Fritilaria-crassa two Sorts, Passion Flowers four Sorts, Colchicums several Sorts, Cyclamens two Sorts, Trumpet Flower, Sopewort, Leonorus two Sorts, Arbutus, *Guernsey* Lilly, Bella Donna, Starworts several Sorts, Geraniums several Sorts, Cotiledons several Sorts, Autumn Crocus, Autumn Daisie, Tree Milkwort, Aloe-leav'd Asphodel, true Saffron, Onion-leav'd Asphodel, Viburnum, Golden Rods two Sorts, Shrub Mallows four Sorts, double Pinks several Sorts, Laurus Tinus, Tamarisk,

Tamarisk, Jalop, Moon Trefoil, Stacus two Sorts, Colutea, Roses, Carnations several Sorts, yellow Colchicum, Candytuft Tree, Grounel Tree, *Dutch Honey-suckle*, *Barba Jovis*, *Tenerum Bæticum*, *Tradescants* double Spiderwort, *Coma Aurea* two Sorts, *Platanus-leav'd Chrysanthemum*, *Roman Wall-Flower*, *Antirrhinum*, *Rose-Campion* single and double, *Throatwort* double white and blue, *Tree Love-Apple* two Sorts, *Sampiere*, *Polyanthus*, *Auricula's*, the monthly *Grape*, several new Sorts of *Annals*.

The following Grapes ripen with me in *August* and *September*.

The *Sweet-water Grape* black and white, the *Muscadine* white, the *Royal Muscadine*, the black *Muscadine*, the white *Chasselas*, the black *Chasselas*, the black *Cluster Grape*, the black *Curran Grape*, the *Zant Curran*, the *Narbois*, *Chianti*, the *Burgundy*, the *Melièr*, the *Munier*, the black *Morillion*, white *Morillion*, the white *Malvoisie*, black *Malvoisie*, variegated *Grape*, *Parsley Grape*, *Bordeaux Claret Grape*, white *Frontigniac*, blue *Frontigniac*, red *Frontigniac*, grizzle *Frontigniac*, *Muscadelle*, *Greek Grape*, *Fox Grape*, *St. Peter's Grape*, *Hesperion*, white *Raisin*, red *Raisin*, blue *Raisin*, *Bourlac*, *Lombardie*, red *Hamborow*, blue *Hamborow*, white *Grizleine*, *Matchless Grape*.

Curious Flowers in October.

Ash-colour and white Tree Scabius, Horn'd Poppy, double Stock Gillyflowers, *Spanish* Jessamine double and single, *Brazil* Jessamine, *Arabian* Jessamine, Nettle-leav'd Jessamine, yellow *Indian* Jessamine, several Sorts of Ficoides, Onion-leav'd Asphodel, Aloe-leav'd Asphodel, two Sorts of Anemone Spermios, Tree Chrisanthemum, Myrtles, several Sorts, ten Sorts of Colchicums, four Sorts of Cyclamens, two Sorts of Leonurus, true Saffron, Arbutus, Guernsey Lilly, Bella Donna, Autumn Crocus, Tree Milkwort, scarlet flow'ring Geranium, with several other Sorts, Chrisanthemum Tree from *Carolina*, Mr. *Catesby's* new *Virginian* Starwort, Pelitory of *Spain*, scarlet flow'ring Viaburnum, black flow'ring Lotus, Coma Aurea, Tree Lychnes, purple flow'ring everlasting Kidney-Bean, old Man's Head Pinks, new Sort of Barba Jovis, Limonium, Laurus-tinus several Sorts, Colutea, Aizoid Tythimals, Roses, Moon-trefoile, scarlet flow'ring Cotildon, Passion Flower, Carnations, Fenel-leav'd Tree Scabius.

Curious Flowers in November.

Spanish Jessamine double and single, yellow *Indian* Jessamine, *Azores* Jessamine,
double

double Stock Gilliflowers of several Colours, Nettle-leav'd Jessamine, Aloes of several Sorts, Ficoides of several Sorts, Sedums of several Sorts, Aloe-leav'd Asphodil, Onion-leav'd Asphodil, Chrysanthemum Creticum white and yellow, Leonurus two Sorts, scarlet flower'd Geranium, with several other Sorts, *Venetian Vetch*, Mr. *Catesby's* fine blue Starwort, Colutea, Tree Milkwort, Coma Aurea, everlasting Kidney-Bean, black flow'ring Lotus, Pelitory of *Spain*, Scabius of several Sorts, Passion Tree in Fruit, Carnations, Sensitive Plant in Flower, Polyanthus,

Curious Flowers in December.

Double Stock Gilliflowers of various Kinds, Sensitive Plants in Flower, Carnations, Tulips, Polianthus, Hyacinths, *Spanish* Jessamine, *Indian* Jessamine, Cyclamens, *Azores* Jessamine, Nettle-leav'd Jessamine, Geraniums several Sorts, Ficoides of several Sorts, Aloes of several Sorts, new Sort of Barba Jovis, old Man's Head Pink, *Venetian Vetch*, sweet scented Cyclamen, Laurus-tinus several Sorts, Candy-tuft Tree, Mr. *Catesby's* fine blue Starwort, *Glastonbury* Thorn.

Curious Flowers in January.

Black Helebore with white Flowers, Helebore with green Flowers, Winter Aconite, Mezereon, Snow Drops double and single, Candy-tuft Tree, Laurus-tinus several Sorts, blue Star Hyacinth, Passetout, Spring Cyclamen, sweet scented Cyclamen, Canary Campanula, Polyanthus, Wall Flowers, Tulips, Anemonies, *Glasterbury* Thorn, new Sort of Barba Jovis, *Venetian* Vetch, Auricula's, Carnations, Kidney-Bean Tree.

Curious Flowers in February.

Spurge Laurel, Mezereon, Snow Drops double and single, double Stocks of several Colours, black Helebore with a white Flower, Helebore with a green Flower, Tulips, Hyacinths, Radix Cava, double and single white and yellow Wall-Flowers, Polyanthus, Milleto, Canary Campanula, Spring Colchicum, sweet scented and Spring Cyclamens, Narcissus of *Constantinople*, Narcissus of *Naples*, Winter Aconite, 20 Sorts of Crocus, Collection of Hyacinths, Auricula's, Polyanthus, Carnations, white and red Mezereons, *Persian* Iris, double Primrose, *Venetian* Vetch, *Cornelian* Cherry, Dens Caninus, *Yorkshire* Sedum, Muscary Hyacinth Ash Colour

lour and white, Periwinkle white and blue, forty Sorts of Narcissus, Hepaticas, Dwarf Almond, Fritillaries, Oranges, Anana's or Pine-Apple Fruit begins to appear.

Curious Flowers in March.

Stock Gilliflowers double of several Kinds, Wall-Flowers double white and red, 30 Sorts of early Tulips, Laurus-tinus, Oranges, Candy-tuft Tree, *Yorkshire* Sedum, black Helebore with a white Flower, black Helebore with a green Flower, Polyanthus, double Primroses, 20 Sorts of Crocus, single white Hepatica, double and single blue and Peach-colour Hepatica, Hyacinths, Spring Colchicum, four Sorts of Spring Cyclamen, four Sorts of Narcissus, Cornelian Cherry, Star of *Naples*, Ranunculus, Dens caninus, Fumetory, Violets single and double white and blue, Fenel-leav'd Helebore, Radix cava, Periwinkle white and blue and double purple, Dwarf *Hungary* Honyfuckle, Asfarabacca of *Virginia*, Petasites, Male Mandrake, Dwarf Medlar, Dwarf Flag Iris, *Venetian* Vetch, Nettle-leav'd Jessamine, 30 Sorts of Fritillaries, Dwarf Almond, Fruit bearing Almond, Simblaria, Mistleto, bulbose Iris, double blossom Peach, Anemonies, monthly Rose, Jonquils, double blossom Pear, double blossom Cherry, double blossom Almond, Arbor Judæ, with

with several other Sorts of Plants, whose Time of flow'ring is uncertain.



*Of propagating the Lemon
and Orange Tree by Layers, and of a
new Hot Bed, &c.*

To Mr. Bradley.

S I R, Oporto, October 22, 1723.

I Return you many Thanks for your acceptable Letter of *August 17, O. S.* with your farther Directions in the Culture of the Pine-apple, which as near as possible I shall observe ; of three Thermometers sent me over, two have been unfortunately broke in the Voyage ; that which escaped was what you had marked the Heighth of the Spirit, *London May 2* ; I have made diverse Observations thereby, sometimes I had in the Morning near 15 Degrees less Heat than at Noon, and the hottest Days this Year, at Noon, the Spirits 'rose to the very Top of the Tube, that it was impossible to make any Observations. I placed another Thermometer by yours, which came from *Holland*, and had the Degrees mark'd on it ; and tho' it was
fixed

fixed in a good Dial-Board a quarter of an Inch deep, yet I found likewise, that the Sun had too great an Influence on the Spirit, and made it rise too high; that I am of Opinion, seeing those Thermometers require to be hung out in the Air, the Tube of them should be so fix'd, to hinder the Power of the Sun, else there will be no Rule. Our Summer this Year has been excessive hot; those that have liv'd in *Brazil*, confess we have had for some Days as warm Weather here as they: Our Summer Season has lasted longer than usual this Year, there having fallen no Rain 'till to-day of several Months; but however, the Weather with it continues so warm, that the Thermometer remains at 35 Deg. and I am of Opinion the coldest Season here, when we have small Frosts, is never more than 50 Deg. but of this I shall be a better Judge, by the Observations during the Winter Season.

In the Management of the Pine-Apple this Year, I have been oblig'd, in the greatest Heats entirely to unshelter the Plants, else the Sun would have scorched them up: One of them this Summer was very sickly, and had like to have dy'd; but about two Months ago I took the Plant out of the Pot, and planted in the Earth, which was heated at the Bottom with a little fresh Horse-dung, which has recover'd it; the other has shot very vigorously,
ly,

ly, and I doubt not but, with Care, to see Fruit from it the next Year. I thank you for your Advice, concerning the Use of dry'd Sea-Sand. I am now about making my Winter Frame for the Anana's, and design to compose it as follows: To make it four Foot deep, the first two Foot to be the hottest Dung well ramm'd in, upon that a Foot and $\frac{1}{2}$ of Sea-Sand dry'd and heated as you order, and the upper six Inches, in which the Pots are fix'd, of dry Cork Dust when it is burnt, which is of a very hot Nature. The Tanners in this Country make use of the Bark of the Cork Tree in their Business, which is what Bark remains to the Tree after the Cork is taken off; but there are so few of them, that it is difficult to get enough; however, I shall make a small Experiment of it as to Heat. The Anana's last Year thriv'd well enough in a Hot-bed only, during the Winter. We want those Things you can easily procure; but however, Nature in some Measure supplies it thro' the Goodness of the Climate. I am glad you design to try the laying of Orange-Trees in the Ground, I'm assur'd it will succeed; our Way of increasing Lemon or Orange Trees is by earthing up a Branch, and peeling off a little of the Bark of that Part of the Branch which is in the Earth, to make it strike Root the sooner; by those Means, when it has got Root, the Branch which is removed, makes
a good

a good new Tree, altho' it has Blossoms, and green and ripe Fruit upon it, for the Lemon-Tree blossoms and bears all the Year throughout. The Way of budding and grafting those Trees on wild Stocks is found here too tedious. As Lemons of late Years here have bore a great Price, it has induced the Owners to endeavour to propagate and increase that Fruit as much as possible. The largest and fairest Fruit of that Sort, is grafted on a Citron Stock.

I am truly, Sir,

Your Obliged Humble Servant,

John Clarke, jun.

The foregoing Letter furnishes us with such Observations as my reader could not excuse my passing by, in a Work of this Nature, which aims at the Good as well as the Amusement of the Curious; and though the laying of Orange and Lemon Trees is in this first publish'd, yet considering the Reason of the Thing, I wonder it has not been practis'd generally before this Time; for almost every one knows, that laying a Branch of a Tree in the Ground, will occasion it to strike Root; and then, why should the Orange and Lemon Trees be alone neglected; for had it been try'd, I am convinc'd it would have
been

been successful, not only from the Assurance given by the curious Gentleman who gives us this Letter, but from the Experience of *William Thornton, Esq;* at *Bloxham* in *Lincolnshire*, in whose Gardens, among many other fine Experiments of his, I found this Method used successfully, but this Gentleman abounds so much in Rarities of this Kind, as well as new Improvements in Husbandry, that to mention them as they should be, would almost make a Volume of themselves; and had it been my Fortune to have known the Master of so happy a Genius, I doubt not but to have found as much Improvement from his Conversation; for *Opus Artificem probat*; but this *en Passant*.

I come now to conclude my monthly Papers, and take the Opportunity of thanking those curious Gentlemen who have been assisting to me in the Work; and I cannot help expressing the Pleasure it has given me, to find many of the Rules I have laid down, put in Practice; and especially to observe how much Men of the greatest Learning have fallen into the Way of Gardening and Planting, since I began to write upon the Subject. The World, I hope, will excuse me if I boast a little of my Success in this Way, since some Complements upon it, have been the chief Reward I have met with, for all my great Expence and Labour; however, as
I can

I can never abandon the Study of Planting and Gardening, as Things that contribute to every Man's private Good, as well as the good of my Country; so whatever curious Discoveries in that Way may be communicated to me, will be very acceptable.

This Piece, with the four preceding Monthly Remarks, compleats a Volume, which will be the Third and Last of my Monthly Writings.



O

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