Plate I. *Frontis*

In this Plate is represented the two Monks who first brought Silk-wo

piece .

as Eggs into Europe, presenting them to the Emperor Justinian.

A

Compendious Account

Of the whole ART of

BREEDING, NURSING,

AND

The RIGHT ORDERING

OF THE

SILK-WORM.

Illuſtrated with Figures engraven on COPPER: Whereon is curiouſly exhibited the whole Management of this PROFITABLE INSECT.

LONDON:

Printed for JOHN WORRALL, at the *Dove* in *Bell-Yard*, near *Lincolns-Inn*; OLIVE. PAYNE, in *Round Court* in the *Strand*; THOMAS BOREMAN, on *Ludgate-Hill*, near the Gate; and THOMAS GAME, at the *Bible* facing the Eaſt End of the New Church in the *Strand*; Bookſellers.

M. DCC. XXXIII.

TO

The Right Honourable

The Lord Viſcount PERCIVAL,

The Right Honourable

The Lord CARPENTER;

AND TO

The reſt of the Honourable GENTLEMEN,

The Truſtees for Eſtabliſhing the Colony of *Georgia* in *America*:

This TREATISE,

On the Management of the SILK-WORM,

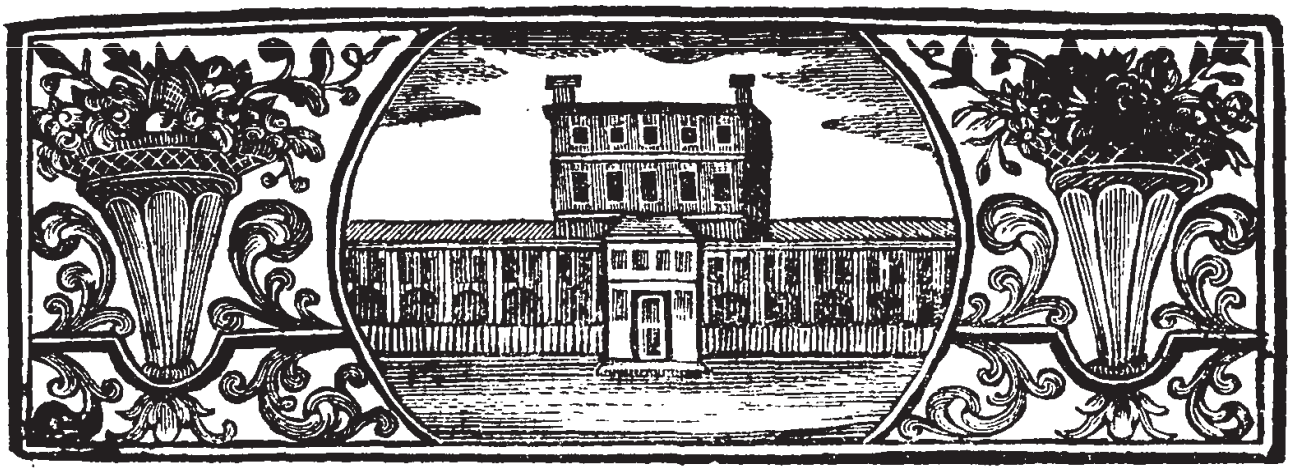
Is with all Humility humbly Inſcribed to your Honours,

BY

Your Honours Moſt Humble, and

Moſt Obedient Servant,

T. B.



THE INTRODUCTION.

THIS ſmall Treatiſe, on the Management of the *Silk-Worm*, was written ſome Months ſince, and deſigned to be printed for the Inſtruction and Entertainment of ſuch Perſons as kept theſe Creatures for their Pleaſure only: Deſpairing of ever ſeeing the Raiſing of the Silk Manufacture again attempted; after the many Endeavours that have been made by ſeveral worthy Gentlemen, in order to eſtabliſh this very profitable Branch of Trade in this Nation, had proved unſucceſsful.

BUT ſince his Majeſty, out of his Princely Goodneſs, having taken into his Royal Conſideration the miſerable Circumſtances of many of his own poor Subjects ready to periſh for Want, and likewiſe the Diſtreſſes of many Foreigners, who would willingly take Refuge here from Perſecution, has been graciouſly pleaſed to grant a Charter for incorporating a Number of honourable, diſintereſted Gentlemen, by the Name of *The Truſtees for eſtabliſhing the Colony of* Georgia *in* America. They are impowered to collect Benefactions, and lay them out in Cloathing, Arming,

ing, ſending over, and ſupporting Colonies of the Poor, whether Subjects or Foreigners, in *Georgia*.

IT is now therefore humbly thought, that the following Treatiſe may be of more general Uſe than it was at firſt intended, becauſe that among the many uſeful Employments deſigned for thoſe induſtrious Poor, that ſhall become the new Inhabitants of *Georgia*, it is with inexpreſſible Pleaſure, we hear that of raiſing Raw Silk is intended as one; and what gives us greater Expectation than ever, that the *Engliſh* Nation will ſpeedily be enriched with this golden Fleece, is from thoſe Honourable Gentlemen the Truſtees wiſe and well calculated Scheme.

THE Eſtabliſhment of the Silk Manufacture in the Dominions of *Great Britain* is certainly a noble Deſign, and excellently well worth thoſe Honourable Gentlemens Conſideration; and that the raiſing of the Silk Manufacture is practicable even in this Kingdom, but much more ſo in our *American* Dominions, has been abundantly made appear, both by the Writings and Experiments of many ingenious Perſons.

THE Climate and Soil of *New England*, *Carolina*, *Virginia*, &c. are each ſo excellently well ſuited to the Nature of the Silk-Worm, and to the Propagation of the Mulberry-Tree; whoſe Leaves are theſe Creatures natural and moſt beloved Food; that they have been often found naturally and wildly, (if I may be allowed the Expreſſion) upon the Mulberry-Trees, *&c.* of thoſe Parts: But being neglected, unleſs by a few curious Perſons, who keep them for little more than their Diverſion, they become Food for Birds, and other Creatures that delight to prey upon the Silk-Worm.

AND

AND thus the Care and Propagation of this wonderful Creature, whoſe well known Uſe is more immediately deſigned by Providence, for the Benefit and Advantage of Mankind, has been for ſo many paſt Ages neglected by the *Engliſh* Nation.

THERE ſeemed to be nothing ſo much wanting before, to eſtabliſh the Silk-Manufacture in *England*, as ſome eminent Perſons to have engaged themſelves heartily in the Undertaking. This would have been the only Means to have excited others to follow their laudable Example: It was by this Method, that they brought the Silk Trade ſo ſoon to ſuch Perfection in *Italy*, &c. that there, not only Perſons of the firſt Rank were engaged in this Work, but the Magiſtrates alſo aſſiſted; each lending a helping Hand, till they ſaw this deſirable and profitable Manufacture firmly rooted and eſtabliſhed in their Countries.

IN whatever Country the Silk Trade is propagated, beſides all other Advantages ariſing therefrom, the Nation in general reaps this one very great Benefit; that it employs a great Number of their induſtrious Poor: for not only Men, but Women, Children, and impotent Perſons, may be made uſe of in this Work; for it is a Work both eaſy and pleaſant, and performed in as delightful a Seaſon as any in the whole Year.

WE are informed by Perſons worthy of Credit, that in *Carolina* Silk is come unto great improvement, ſome Families making forty or fifty Pound weight a Year, and their Plantation Work not neglected; little Negro Children being ſerviceable in feeding and looking after the Silk-Worms. And that there is no Tree in *Carolina*, that thrives better than the Mulberry-Tree, which flouriſhes in that Climate

as well as in any Country in the World. This plainly ſhews the very great Advantage that is to be made by keeping of Silk-worms; firſt, it takes up but about two Months Time, which this whole Work is begun and ended in; next, the Perſons made uſe of to attend theſe Creatures, are chiefly ſuch as are unfit for any other Employment.

THERE can be no material Objection againſt the Facility of raiſing this deſirable Trade in thoſe Parts: Providence having amply furniſhed that Country with all the Materials fitting to build, and carry on this noble Work. Therefore it is to be hop'd, from the conſideration of the fitneſs of the Place to propagate the Silk Trade in; (beſides ſeveral other uſeful Employments) the Eaſineſs of its being perfected, the Benefit that it will be to every ſingle Perſon concern'd in keeping of Silk-Worms, and to the Nation in general, by relieving ſome thouſands of poor unhappy People, who are now in a ſtarving Condition; by placing them in Employments, whereby they may be able to provide for themſelves and their periſhing Offspring: that this will incline the Hearts of People of all Ranks to contribute towards the carrying on of this Undertaking; and that the Truſtees may be the better enabled with ſpeed to accompliſh this their noble Deſign.

IF this Treatiſe contains any thing that may be thought uſeful towards the promoting of this excellent Undertaking; then will the Writer of it think himſelf amply rewarded. And that all the Endeavours of thoſe Honourable Perſons the Truſtees, that tend to this noble End, may meet with Succeſs, is the Prayer of him, who is heartily, and truly, the Well-wiſher of this Nation's good,

T. B.

THE ANTIQUITY OF THE *SILK-WORM*, AND The Manner of its being firſt Introduced into *EUROPE*.

I CANNOT ſee any reaſon to doubt, but that the *Silk-Worm* had its Original within the ſixth day of the world's Creation; on which day the Species of all land Inſects, Quadrupeds, &c. were created, as the Sacred Penman informs us, (*Gen. chap.* 1. v. 24.) *And God ſaid, let the Earth bring forth the living Creature after his kind, Cattle and creeping Thing and Beaſt of the Earth after his kind: and it was ſo.* But, whether

the *Antideluvians* had diſcovered any Knowledge of this noble Inſect, the manner of its ſpinning its Web, and its uſefulneſs to Mankind for Clothing, *&c.* doth not appear. Neither is it certainly known at what time after the Flood, or by what Nation, they were firſt taken notice of. It is by ſome attributed to *Noah*, that he firſt diſcovered the Uſe of theſe wonderful Creatures; and propagated them in *China*, where he is ſuppoſed to have ſettled after the Flood, and become a Husbandman in thoſe Parts; and by ſome is thought to be *Fohi*, their firſt King. Others contend that the Knowledge and Propagation of the Silk-Worm were as early made known to the *Perſians* by the ſons of *Noah*, or their Poſterity. Be that as it will, it is certain that both theſe Nations had the Knowledge of Silk very early, and were the firſt that propagated Silk, and reap'd the Profit and Benefit of it many hundred Years before any other Country. For the firſt time that any Silk was brought into *Greece*, was after *Alexander* the Great had conquer'd *Perſia*, and about three hundred Years before the Birth of our Saviour, which is about two thouſand Years ſince the Knowledge of it in thoſe Parts. And from thence it came into *Italy*, in the flouriſhing time of the Roman Empire. But it was a long time very dear in all thoſe Weſtern Parts, as being weight for weight of equal value with Gold, a Pound of one coſting a Pound of the other. *Perſia* was the only place which the *Europeans* frequented for the ſake of their Silk: and it is certain that the *Perſians* took Care for many hundred Years to keep their Manufactures to themſelves, not permitting the Silk-Worms to be carried out of *Perſia*, or any Perſons to paſs from thence into the Weſt, who were skilled in managing of them. This made them in *Europe* to be ſo ignorant, as to think, that Silk grew on the tops of Trees, as Cotton.

So that by this may be ſeen how ignorant the *Europeans* were, as to the Knowledge of the production of Silk; and remained ſo until the time of *Juſtinian* the Emperor, the Reign of which Emperor began *A. D.* 526. He looking on it as a great Hardſhip, that the Subjects of his Empire ſhould buy this Manufacture of the *Perſians* at ſo dear a Rate, in order to put an End to this Impoſition, ſent two Monks into *India* * (underſtanding that there was plenty of Silk in thoſe Parts) to learn there how the ſilken Trade was managed; and on their return to bring with them, if it was poſſible to be procured, ſome of the Species, whether Vegetable or Animal, from which the Silk was produced; that ſo he might ſet up the Manufacture in his own Dominions. Theſe Monks, when they returned, told him, that the Silk was produc'd by an Inſect, which could not be brought ſo long a Journey alive. But underſtanding from them that its Eggs might be brought; and that

* The whole countrey of *China* was antiently (as *Ptolemy* ſays) called *Serica*, from its abounding with Silk; for the ſeveral Provinces have great numbers of Silk-Worms, and ſuch vaſt quantities of Silk, that the inhabitants thereof ſpend the greateſt part of their Time in tending, looking after, and taking Care of the increaſing of them: So that ten Suits of Silk may there be bought cheaper than you can buy one of Cloth in *Europe*. And the *Chineſe* continue to make the greateſt Advantage thereof to this Day of any Nation, by planting the Seed of the Mulberry-Trees twice a Year, and mowing them down to feed their Silk-Worms with; by which means they have two Crops a Year. Thoſe which they do not mow they cut every Year, that ſo they may not grow up to any largeneſs; for they find by Experience, that the Leaves of the low or young Trees make the beſt Silk: ſo that by this only means, all who keep Silk-Worms know very well how to diſtinguiſh the firſt ſpinning of the Silk from the ſecond, becauſe the firſt is the Product of the ſoft and tender Leaves, which ſhoot forth firſt in the Spring, and are then eaten by the Worms: but the hard and ſour Summer Leaves make the ſecond Spinning; which Alteration of Food doth occaſion ſo great a difference in the Product of theſe ſmall Creatures.

from them the Creatures might be propagated; He ſent them back a ſecond time, to bring him of thoſe Eggs; who, having effected what they went about, brought to *Conſtantinople* great quantities of thoſe Eggs, which they preſented to the Emperor, encloſed in a Roll or Horn of Paper, with Inſtructions how to breed, nouriſh, and draw Silk from the ſaid Creatures; which was received with great Applauſe and Admiration, [*See Plate* 1, *facing the Title.*] And from them have been propagated all the Silk-Worms, and their Silk in *Europe*.

A Deſcription of the SILK-WORM, *and of its ſeveral Transformations.*

THE firſt is from an Egg of the bigneſs of a Muſtard-ſeed, of a Liver-colour, to a Worm or Caterpillar of a pale Cream-colour inclining to white, with one ſmall dark Circle on each ſide upon every Joint, and two half Circles on its Back; having ſix Feet, *viz.* three on each ſide near the Head, and ten *Holders*, *viz.* four on each ſide near the middle of the Body, and one ſmall one on each ſide near the Tail. During this Form it undergoes conſtantly four Sickneſſes, each laſting about three Days, wherein it feeds not at all, but grows thicker, ſhorter, and clearer and at each ſickneſs changes its Skin.

THE ſecond Change is, from a Worm to an *Aurelia* or *Chryſalis*, of the ſame Colour as the Egg, having the ſhape of a ſmall Plum, [See *Plate* 2.] whereunto it is transformed after its ſpinning time; in which ſtate it lies ſhut up in hot Countries for fourteen or fifteen Days, in more temperate ones eighteen or twenty Days, without any Food known to us: during which time,

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time this Inſect leaves two Coats, both that of a Worm, when it is changed into an *Aurelia*, and that of an *Aurelia*, when it becomes a Moth in its Silk-caſe or Bottom.

THE third Transformation is, from an *Aurelia* to a *Moth*, coming out of its Caſe, with a Head, Legs, Wings, Horns, *&c.* For which Paſſage, it makes way by a whitiſh Water it caſts upon the Silk; which moiſtening, and thereby in a manner putrefying it, the new Creature eats its way out thro' the ſharp end of the Caſe, by a Hole as big as itſelf. There is found no Excrement in the Caſe, but only the two Skins juſt mentioned. This laſt Change into a *Moth* is the Perfection of this Inſect. Soon after the Male and Female *Moths* are come out of their Caſes, they Couple, and continue coupled for eight or ten Hours, the Male having ſpent himſelf, falleth down, and in a ſhort time after dieth; and the Female, having firſt laid her Eggs, ſhareth the ſame Fate. The Eggs, when they are firſt laid, are of a pale Yellow, but in a few Days change into a Liver-colour. And, what is wonderful, theſe Eggs are kept ten Months in the Year as a dead Thing, taking Life again in their Seaſon.

Note, That *Caſe*, *Silk-bottom*, *Cod*, *Ball*, *&c.* are only divers Names for one and the ſame Thing.

The manner of Hatching the SILK-WORMS *Eggs; and how to order the Worms.*

FIRST of all, great Care is to be taken to be furniſhed with Mulberry-leaves, ſufficient to ſupport ſuch a number of Worms as you intend to breed. It is eſtimated that Silk-

worms,

worms, produced from an Ounce of Seed, eat, in their whole time of Feeding, from two to three hundred Pound weight of Mulberry-leaves. Being provided with Eggs, and ſecured of Leaves for the maintenance of the Creatures; in order to hatch them at the proper Seaſon, obſerve the following Method.

When the Mulberry-Tree begins a little to Bud, which is about the latter end of *April*, or beginning of *May*, take the Silk-worms Eggs, and put them into little ſafe deal Boxes, lined with Paper, about an Ounce of Eggs in each Box *; or elſe tie them up in Linen, or fine Lawn-Bags. Theſe Boxes or Bags you may put into your Boſom, or in your Pockets next your Body in the Day time, taking Care not to preſs or ſhake them too much; and on Nights between warm Pillows put under your Bolſter or Bed; to the End that they may continually receive as it were a natural Heat, during the whole time of their Hatching: Not but that the Nature of this Creature is ſuch at the proper Seaſon, that the Eggs will Hatch of themſelves, there is no preventing of them, unleſs by keeping them extraordinary cool. Some eſteem this the beſt way of hatching the Eggs, as being more

* It is a Practiſe uſed in ſome Countrys where Silk-Worms are kept, that a little before they begin to hatch the Eggs, they firſt put them into ſome of the beſt and ſtrongeſt Wine made luke-warm, ſtirring them gently for about half a quarter of an Hour: by which means they ſever the Decayed from the Sound, the bad floating on the Surface of the Wine, and the good ſinking to the bottom, being heavier, which only are to be preſerved as fit for uſe. This practiſe is intirely needleſs; if it does no damage, it certainly adds not the leaſt Virtue to the Eggs. In ſome parts of *France*, inſtead of putting the Eggs into the Wine, they ſpurt it on them with their mouths, and after ſever them with a Knife: this method is as needleſs as the former. They will ſucceed as well without any ſuch means.

Natural.

Plate III.

The Women examining and preparing the Eggs in order to putt

into Bags or Boxes for hatching, according to ȳ practice used in France

Natural. Others prefer the other way, becauſe the Worms hatch much ſooner: But the former way of aſſiſting them with warm Pillows, *&c.* is certainly the Method that has been practiſed with Succeſs, both in *France*, *Spain*, &c. for many Ages paſt.

THERE is no great Danger or Difficulty in hatching the Eggs; the chief Thing to be regarded is, to keep them continually warm; therefore if you put the Boxes or Bags in the Day-time in a Room where the Sun ſhines powerfully upon them, or place them upon a Hearth where they may receive a moderate Heat from the Fire, either of theſe ways will do as well as the former.

AND this Method you are to obſerve for three Days, without looking upon them, for fear the cold Air injure them; and, if there be no appearance of any being hatched, you may continue them warm two or three Days longer; and then without doubt you will find ſome of them hatched, which muſt not be ſeparated from the Eggs that are not hatched, but put all together with the Linen, into a deal Box. This is to be underſtood of thoſe only that are hatched in Linen, or fine Lawn Bags; for ſuch as are hatched in Boxes are to be ſeparated from the Eggs that are unhatched by this Method, (and the Reaſon of putting the former into Boxes is, that they may be ſeparated as they come out of their Eggs, after the ſame manner.) Take a piece of clean white Paper pierced full of ſmall Holes, that will juſt fit the inſide of the Box *. This muſt be laid upon the Eggs, and new hatched

* The Method uſed by many People that keep Silk-Worms in *England* is, as faſt as the Worms hatch, with a feather or a hair pencil, a little wetted, to juſt touch the Worm, and it will ſtick to it; and by this means they remove them to the Boxes prepared for nurſing them in.

Worms; and upon the Paper put three or four of the youngeſt and tendereſt Mulberry-leaves; or for want of them young Lettice, Succory, or Bramble-leaves, which the Worms will feed upon very freely, eſpecially the Lettice, and likewiſe on the Leaves of many other Trees; yet none are ſo agreeable to the Silk-worm as the Mulberry-leaf, the other being apt to ſcour them too much. Therefore it is better to keep back the Eggs from hatching, till you are ſure of Mulberry-leaves, (and keep them conſtantly to that Diet,) and the young Worms will come thro' the Holes of the Paper, as faſt as they Hatch, to feed upon the Leaves.

As ſoon as you ſee your new hatch'd Worms come upon the Paper, and get upon the Leaves, then you may open your Boxes every two Hours, or oftner; and theſe Leaves with the Worms upon them you muſt ſtill remove, without touching the Worms with your Hands, into other Boxes, laying freſh Leaves as well on thoſe that are removed, as on the Paper where the Eggs are; and this is the Method which muſt be duly kept and obſerved, until all the Worms are hatch'd, which will be in about five Days from their firſt beginning to hatch; for what Eggs remain unhatch'd in that time (if proper Care has been taken in order to hatch them) may be thrown away, as not good. Thoſe that are hatched Day by Day muſt be kept apart, upon account of their different times of Sickneſſes; and knowing the time of their ſleepy Diſeaſes, which come upon them, you may prevent the Accidents and Evils which attend them; which are four in the time of their feeding; the firſt about twelve Days after they are hatch'd, and from that time at the end of every eight Days, according to the Weather, and their good or ill Uſage: During which time of every Sickneſs, which laſteth three or four Days,

you

you muſt feed them but very little, as only to relieve ſuch of them as ſhall have paſs'd their Sickneſs before the reſt, and thoſe that ſhall not fall into their Sickneſs ſo ſoon. Wherefore, until they come to their firſt Sickneſs, give them young Mulberry-Leaves twice a Day, but few at a time: from thence, until their ſecond Sickneſs, twice every Day in greater Quantity; and ſo from their ſecond to their third Sickneſs, increaſing the Quantity of the Leaves, according as you perceive the Worms to grow in Strength, and clear of Sickneſs. From the third until the fourth Sickneſs, you may give them Leaves thrice every Day; and, the fourth being paſt, you may let them have ſo many as they will eat, always taking care that you give them none but ſuch as are dry, and well aired upon a Table or Cloth, before they be laid upon them; and withal gathered, ſo near as may be, at ſuch times, as either the Sun or Wind hath cleared them of the Dew that falleth upon them.

Note, The Worms eat more Leaves in three or four Days after they have paſſed their fourth Sickneſs, than they did in all their time before.

LET the Leaves be gathered with clean Hands; be careful not to bruiſe them; and let the Bags or Baskets that you put the Leaves into be very clean.

N. B. The Leaves are accounted better for the Worms, when they have been gathered four or five Hours, than freſh from the Tree; and in rainy Weather they will keep about two Days, by turning them two or three times a Day, without bruiſing them, and be fit for Food.

WHEN you perceive the Worms to grow in Bigneſs, and preſs one another too much, you may remove them to Shelves. Obſerve in the removing of them, to do it by giving them freſh young Mulberry-Leaves, and taking them out again in a quarter of an Hour, or thereabouts, with the Worms that are upon them, without touching the Worms with your Hands: And this do till you have removed all the Worms to the Shelves prepared for the nurſing them on, after the following Manner.

RAISE in a convenient airy Room, as many Shelves made of dry wholeſom Wood, free from any ſtrong offenſive Smell, as likewiſe let the whole Scaffolding be, as you judge ſufficient for your Purpoſe. Place theſe Shelves three, four, or five Stories, one above another, according to the Height of the Roof of the Houſe, or the number of Shelves you ſtand in need of, and at about eighteen Inches diſtance; the lowermoſt being about three or four Foot broad, and let each of the other Shelves fall four or five Inches narrower than the next under it; that, if any of the Worms ſhould fall off from one Shelve, the next may catch them. Let the whole Scaffolding ſtand at ſome diſtance from the Wall, that you may go round them, the better to obſerve and attend them, and alſo the better to ſecure them from Rats and Mice, which will deſtroy the Worms. They have likewiſe other Enemies, which they muſt be defended from, ſuch as Cats, Poultry, Birds, *&c.* The Shelves being thus prepared and ſecured for the feeding of the Worms, your need obſerve no other Order than this: Lay under them upon the Tables or Shelves, Leaves of broad, courſe, clean Paper, until ſuch Time as the Worms have paſſed their third Sickneſs; then the Paper may

be

Plate IV.

In this Draught is shewn how you are to range your Scaffold

d Shelves to place your Worms, and Leaves to feed them.

be taken away; and twice a Day give them new and freſh green Leaves to feed on. And every two or three Days remove them, and make clean their Boxes or Shelves, unleſs in times of their Sickneſs; for then they are not to be touched: The Leaves which you take from them, when you give them freſh to feed on, you may lay in ſome convenient Place, and upon them a few new Leaves, to which the Worms that lay hidden in the old will come; and then you may paſs them with the ſaid new Leaves to the reſt of the Worms. The being careful to keep clean their Boxes or Shelves, is a ſpecial means whereby to preſerve them: Wherefore, when you intend to do it, you muſt remove them, together with the uppermoſt Leaves whereon they lie, unto other Boxes or Shelves; for with your Hands you may not touch them, till they have throughly undergone their third Sickneſs; and then you may paſs them gently with clean Hands; provided that the Party that cometh near them ſmell not of Garlick, Onions, or any other ſtrong offenſive Smell; which Caution is to be obſerved at all times, whilſt the Worms are feeding, *&c.* The firſt five Weeks of their Age, you muſt be very careful to keep them warm, and in time of Rain, or cold Weather, to ſet in the Room a Pan of Small-coal Duſt, burning in it now and then ſome Incenſe, Benjamin, and ſuch like as yield ſweet Smells. But afterwards, unleſs in time of extraordinary Cold, give them Air, and take heed of keeping them too hot. As the Worms increaſe in Bigneſs, you may diſperſe them abroad upon more Boards or Shelves, and not ſuffer them to lie too thick together: And if you find any of them broken, or of a yellow glittering Colour, inclining to Sickneſs, caſt them away, leſt they infect the reſt: And ſort ſuch as are not ſick, the greateſt and ſtrongeſt by themſelves; for ſo the leſſer will proſper the

better. Before they begin to ſpin, and about the latter End of their feeding, they muſt be often changed, and have Air enough, by opening the Windows of the Room, if it be not ill Weather; elſe the Silk, which is in their Belly, will cauſe ſo extraordinary a Heat in them, as to burn their Inteſtines, and ſometimes burſt them. The whole time of their feeding is about forty or forty-five Days, that is, from their firſt hatching, to their beginning to ſpin their Web. The beſt Diſcovery of their Maturity for ſpinning is, when they begin to quit their white Colour, and their Bodies appear of a clear tranſparent fleſh Colour, eſpecially upon their Tails, and are reſtleſs, neglecting to feed. Then you muſt prepare clean dry'd Branches of either Birch, Briars, Vine, Roſemary, or the Stalks of Lavender. Obſerve to dry your Twigs or Branches well in the Sun, becauſe the leaſt Moiſture, join'd with the Heat of the Worms, would cauſe a great Diſorder. Place your Boughs or Branches in Ranges againſt the ſides of your Shelves upright, at about a Foot diſtance, the largeſt end reſting upon the loweſt Shelf, and the ſmall end of the ſmall Boughs reſting againſt the next Shelf; ſecuring them from falling, ſo that you may bend and ſpread them about, making as it were Arches of them. Then between the Foot of the ſaid Boughs, upon the Shelves, you are to put the Worms, giving them freſh tender green Leaves, as many as they will eat; and as you perceive them to be ready to ſpin their Silk, they will be climbing up the ſaid Boughs. In their getting up, you muſt take care that they do not mix two or three together, to make one Ball or Bottom; which will make the Silk double, and be no Profit to the Maſter. At this Period you muſt cleanſe them very often, becauſe they dung much. Now, if you perceive that in ſome Days after your Arches are fitted, and moſt of the Worms

are

Plate V

In this is Shewn the manner of placing the twigs for the wo

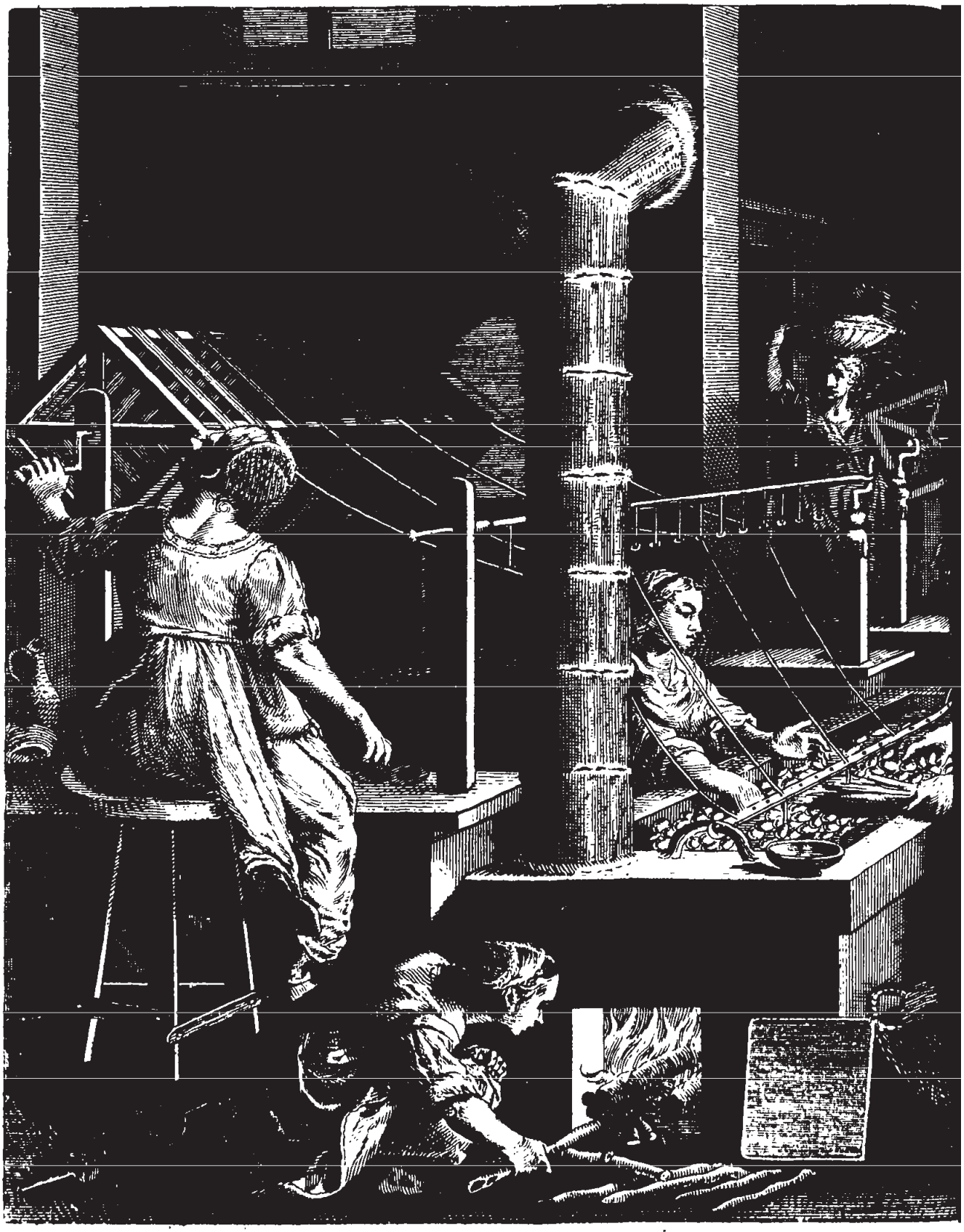
climb up and Spin their Silk &c

are getting, or got upon the Boughs or Twigs, and that ſome of them do not endeavour to get up, ſhift the Traſh under them, and apply Vinegar and ſweet Herbs, as before; or rub all their Apartments with the Leaves of Fennel, Lavender, or Thyme, and they will ſoon become diligent in their Labour. They muſt be by no means diſturbed or interrupted in their Work, to the end that their whole Store may be exhauſted. As for their manner of working, it is obſerv'd, that the firſt Day they make only a Web, the ſecond Day they form their Caſes in this Web, and cover themſelves all over with Silk. The third Day they are no longer ſeen; and the Days following they thicken their Caſes, always by one End or Thread, which they never break off themſelves.

THERE have been ſome ingenious Perſons, who have had the Curioſity ſometimes to meaſure the Silk that completed one of their Caſes; which has been found to have been above three hundred Yards, and weighed but two Grains. When the Worms have finiſhed their Balls, which is within four or five Days from their beginning to ſpin, though according to ſome, it is eight or ten Days before they have completed their Bottoms: then muſt you take away the Branches, carefully ſeparating the Balls from them. Make choice of the very beſt Bottoms, to propagate their Seed for the next Year; which ſome give you theſe Signs to know them by, *viz.* The forwardeſt, the hardeſt, the reddeſt or beſt coloured muſt be choſen, and as many Male as Female Caſes. Note, Two hundred Silk-Cods will make one Ounce of Seed; that is to ſay, one hundred of Males, and one hundred Females, will produce that Quantity; for one Female Silk-Moth will lay two hundred Eggs, which are diſtinguiſhed thus, the Male's being pointed

pointed at both ends of the Caſes, and the Female's more blunt on the ends, bigger belly'd, and looſer. And that care be had, that no Caſes be choſen, but thoſe wherein the Aurelias are heard rolling. From the reſt, wind off the Silk in four or five Days, or in ten at moſt, to prevent the Aurelia from eating through; which it will do, if you ſtay fifteen or twenty Days after they have done ſpinning. By this quick diſpatch in winding off the Silk, you will have the beſt ſort. But, if you have not time to wind them off preſently, you muſt kill the Worms, either by the heat of the Sun, or in an Oven: if in the Sun, you muſt ſpread the Silk-Bottoms in the Sun at Noon-day, upon Planks, or ſuch like, for an Hour or two; turning them often. After that, gather them all into a heap in a Linen Cloth, and alſo cover them ſo cloſe, as to ſmoother the Worms within their Bottoms; and continue ſo doing two or three Days. In caſe the Sun ſhould not be hot or powerful enough, you muſt have recourſe to the Oven, after the Bread is drawn; but let them not remain above an Hour in the Oven, leſt the Silk ſhould be ſinged, or being too dry, become unfit to be ſpun. There is another way to kill the Worms in their Bottoms, practiſed in *Meſſina*; where they have Furnaces, great Cauldrons, or Coppers for this uſe. Theſe they fill half full with Water; then they lay a round Lid or Cover of plank or board within the Copper, which touches not the Water, altho' it lies within four or five Fingers breadth of it. This muſt be bored as full of holes as a Sieve; and covered with a thin Carpet of Darnix, or ſuch like: then lay your Silk-bottoms upon the Carpet, ſtirring them often: and cover the Copper at top to retain the Heat; that it may ſmoother the Worms in the Bottoms. When they are dead, take out the bottoms,

Plate VI.



This Print repreſents the Machine to wind off the Silk f

the Cods, with Furnaces and Cauldrons for that purpose.

bottoms, and lay them in an airy Room, to dry up their moiſture; then keep the Silk-bottoms in a place where they may not be preſſed too hard, and where Vermin cannot come; you may reſerve them till you have leiſure to wind the Silk. By this method the Silk loſeth not its Colour; and is as good and manageable as if it had been ſpun, when the Worms finiſhed it.

The Way of winding off the SILK, *from all ſorts of Bottoms.*

SET upon the Fire a Kettle, or Cauldron, almoſt full of Water: make it juſt ready to boil, and take off the ſcum: then put in your Balls, which you muſt ſtir about with a little Bruſh or Whick; and, if the thread doth not appear, you muſt increaſe your Fire; but, if it comes eaſily, diminiſh your Fire, and you will find the end of the thread faſten'd to the Bruſh; which take hold of with your Finger, and ſtretch it two yards or more, until the courſeſt of the Silk, which always comes firſt, is unravelled: cut off this part, and lay it aſide, keeping faſt hold of the other end ſtill: when you have found the end of your Threads of Silk-Balls after this method, you muſt proceed to the winding of them with a Machine or Reel. According to the ſort of Silk which you intend to make, you muſt take the number of the Threads together, holding them very cloſe with your Finger and Thumb, to prevent any knots or traſh paſſing together with the Silk; and, to render the Work more eaſy, you may place a Stick a

crots

croſs the Reel, which is called a Lancet, fixed a little higher than the Bobbins: in which Stick place a Ring made of Wire, to keep the Threads together, before they come to the Bank of the Reel; which Threads you muſt direct with your Finger and Thumb. In winding the Silk, you muſt continue the ſame number of Threads with which you began, to the concluſion. If one Thread breaks, you muſt join it together; if one Bottom ends before the other, you muſt ſupply it again. As your Water grows foul with dead Worms, or Traſh, you muſt ſcum them off; or, when dirty, be ſupplied with clean Water. The value of the Silk conſiſts in the clearneſs, lightneſs, and number of Threads joined together: The common ſort is four Threads: if you have a mind to make that which is called *Organcine*, you muſt join ſix Threads; if that ſort called *Verone*, twelve or fifteen Threads together. We are told by Gentlemen of good intelligence, that they are arrived to ſuch a perfection in *China*, that the charge of making a pound of Silk there does not ſtand in above five Shillings; and almoſt any Perſon, Man, Woman, or Child, may work at it. And a Man or Woman, with a Child to aſſiſt in directing the Thread of the Silk, may, with a proper Machine, reel from the Silk-Bags one pound a Day.

How to preſerve the SILK-WORM*'s Eggs.*

IN about fifteen or twenty Days after the Silk-Worm has finiſhed its Bottom, it will pierce its way out of its Caſe, transformed into a Moth. Therefore, before that time you are with a Needle and Thread to couple the Male and Female bottoms;

bottoms; and take care not to thruſt the Needle thro' the bottom, for fear of hurting the Chryſalis, but on one ſide only; paſſing thro' the firſt Courſe, Down, or Sleave; then hang them up where vermin cannot come; and when the Aurelia is turned to a Moth, and come forth, you are to take it by the wings, and ſet it upon a ſhelf, that the Male and Female may couple together. The Male may be diſtinguiſh'd from the Female, by having a leſſer Body, broader Horns, and fluttering his Wings oftner, and more ſtrongly than the Female. The Male fluttering with his Wings, will join and couple with the Female: The Female having firſt purged herſelf of a kind of reddiſh Humour by the fundament; muſt be left in that poſture for about nine or ten Hours, in which they will continue ſometimes for twenty-four Hours together, if they be let alone; and in that caſe the Female will receive very great hurt, or much Seed will remain in her Belly. Obſerve, after the Male and Female have coupled a ſufficient time, (which, as I obſerved before, is about nine or ten Hours) that you be provided with ſome ſtuff that hath no Wool upon it, as fine Lawn, Linen, or Paper; hang this up in a Room, and put the coupled Moths together upon it, as they are; removing them by the Wings; and then the Female is to be gently pulled away, and not ſuffered to couple twice. The Female will then lay her Eggs, having firſt let fall another Humour, which is thought to proceed from the Seed of the Male: and the Male is to be thrown away as uſeleſs. The Seed, at firſt coming out, is of a pale Yellow; but within a few days after it is laid, turns to a liver Colour, which is a ſign of Goodneſs; whereas thoſe which remain Yellow, and don't change to a liver Colour, are of no value, having no fecundity in them. When you ſee that all the Moths are dead, and the Eggs turned to a liver Colour, you muſt not take them off

the ſtuff they are firſt laid upon *, but wrap the Eggs up in it; and put them into an Earthen Pot; which muſt be kept in a temperate Place, in Summer; in Winter, put them into a Box, which Box put into your Trunk or Cheſt amongſt your Woollen Clothes, where let them remain until the next Year.

Some account of the Profits ariſing from keeping of SILK-WORMS.

SILK-WORMS, produced from an ounce of Eggs, eat, in their whole time of feeding, from two to three hundred Pound weight of Mulberry-Leaves: and that number of Worms will ſpin from five to ten pound weight of Silk, more or leſs, according as they are in largeneſs and goodneſs. They require the attendance of two Perſons for about two months, one to gather and bring Leaves, the other to feed, clean, and manage the Worms, in which ſpace of time the whole Work will be compleated.

Note, That two Perſons will attend and feed all the Worms that come of ſix Ounces of Eggs, till they be paſt their fourth Sickneſs, and within a Fortnight of their Spinning:

* *N. B.* It has been directed by moſt Perſons who have treated on this Subject, that the Eggs are to be taken off from the Paper, (or whatever elſe they are lay'd upon) carefully with the Point of a Knife: this is an Error that has eſcap'd moſt of their Obſervations, for it cannot be done without manifeſt hazard of ſpoiling the Egg: Beſides, it is contrary to Nature, who is ever careful in preſerving the ſeminal Principle of both vegetable and animal Bodies; an inſtance of which is conſpicuous in this little Egg; by ſupplying it with a glutinous Matter, which ſticks and as it were rivets it to the thing the Moth firſt lays her Egg upon, and it is undoubtedly faſtened on purpoſe that the young Worm at its time of hatching, may with more eaſe come out, and clear it ſelf of its Shell; for otherwiſe was the Egg looſe, it would be liable to numberleſs Accidents, and the young Creature be forc'd oftentimes to drag the Shell after it, and ſometimes fall down and periſh.

and

and then the Worms muſt be more carefully fed and attended; it being the chief time wherein they make and ſtore up the materials for their Silk; then there are required five or ſix Perſons to aſſiſt in feeding and managing the Worms.

IT is eſtimated, that in *France* a fourth part of the Silk defrays all charges: and in *Italy*, where it has been longer improved, a ſixth part will diſcharge all expences, clearing five parts: and they reckon the Mulberry-Leaves the half of the whole Charge, if they are forced to buy them. It is cuſtomary in many places where great numbers of Silk-Worms are kept, for Gentlemen to let out their Mulberry-Trees to the Poor, and ſuch Perſons who make it their buſineſs to nurſe theſe Creatures; which turns to a very good Account.

Note, That the foregoing inſtructions concerning the management of the Silk-Worm, are agreeable to the Practice of thoſe Countries where theſe Creatures are Nurs'd, *&c.* as a Trade for a livelihood, only I have interſpers'd ſome late improvements made by divers Perſons on this Subject. And that the Figures annexed to this Treatiſe are copy'd from the draughts, publiſh'd by *Le Tellier* in his Treatiſe on this Subject (excepting the Plate repreſenting the ſeveral Transformations of the Silk-Worm, which was delineated by the ingenious Mr. *Eleazar Albin*) printed at *Paris*. That Gentleman, from his nice, curious, and long Obſervations on this pleaſant, and no leſs profitable Subject, having diſcovered more of the nature and management of the Silk-Worm, than any that went before him; and as he himſelf tells us, that not only many of his predeceſſors were maſters of Silk-Worms, but for his own part he was ſo particularly curious in this Buſineſs, that he took a Tour thro' the ſeveral Provinces of *France*, into *Spain*, *Italy*, and other

places where the Silk-Trade was eſtabliſh'd, on purpoſe to obſerve the different ways of managing the Silk-Worms. And from the then moſt approved Method he delineated theſe curious Draughts, which I have copy'd, excepting in a few Particulars that I altered, that I might thereby adapt them to the more improved Diſcoveries of modern Obſervations.

I ſhall here ſubjoin the manner of Breeding, &c. of SILK-WORMS, *as practiſed by many young Ladies and others of this Kingdom, who keep theſe Creatures for their diverſion.*

AT the ſeaſon of the Year for hatching the Silk-Worms Eggs (which as I obſerved before is about the beginning of *May*) they provide ſome Sheets of fine white Cap-paper, and each of theſe Sheets they make into the form of a Dripping-Pan, by turning up the Edges of the Paper about an Inch and half on every ſide, in theſe Paper Pans * they put the Silk-Worms Eggs, placing them in a Chamber Window, where the Sun ſhines powerfully upon them, and ſecuring them from Cats, Birds, *&c.* they there leave them day and night to hatch of themſelves, and when they preceive the Worms begin to come out of their Eggs, they give them young Mulberry-Leaves, or for the want of them, they feed the Worms with the Leaves of Lettice, till they can have Mulberry-Leaves, and then they keep them conſtantly to that diet. And, after this manner, in theſe Paper Troughs or Pans they feed them till their ſpinning time, taking care to clean them every

* There is a Conveniency in feeding the Worms in theſe Paper Troughs, becauſe they may the more eaſily be removed, either up Stairs or down, or from one Room to another, if there ſhould be occaſion.

Day,

Day, or as often as Occaſion requireth it; and if they are minded to remove the Worms to other Troughs or Pans, they give them a few freſh Leaves, and the Worms will come preſently upon them. So theſe Leaves they remove with the Worms upon them; but if the Worms are grown large, they take them gently in their hands, and put them into other Troughs. When the Worms have fed their full time, and are ready to ſpin their Silk, they roll up white Paper like a Wafer, theſe they pin up againſt the hangings of a Room, or to Lines tied croſs the Room, and in theſe Papers they put every ſingle Worm, as they perceive it wants to ſpin, which it will begin to do generally as ſoon as it is put into the Paper. When the Worm has finiſhed its caſe, and changed into a Chryſalis, which is known by hearing it rattle, when it is ſhaken at the Ear. Then they proceed to wind off the Silk, according to their different Methods; never ſuffering the Moth-Fly to eat its way out of the caſe, not even of thoſe that are deſigned to propagate Seed for the next Year.

A GENTLEMAN whom I have known to be very particularly curious in his Obſervations and Experiments upon the Silk-Worm; his Method in winding off the Silk was, as ſoon as the Worms had finiſhed their Bottoms, and changed into a Chryſalis, to put the Bottoms into warm Water, with ſome Spirit of Wine in it, which by Experience he found facilitated the winding off the Silk very much; the Ends he found very eaſily, and wound it on a Card in his Hand, without any Reel or Machine at all: And as the Silk-Caſes were wound off, he took the Chryſalis of each, and placed them in one of thoſe clean Paper-pans, erect upon the piqued end; and when its time was accompliſhed, that it was to enter upon its laſt Transformation of a Moth-Fly, it aſſumed its new State, as well as if it had continued the whole

time

time in its Silk-caſe; and this Method has been obſerved by divers other Perſons, who wind off the Silk after the ſame manner. When the Silk-Moths are come out of their Shells, being perfectly transformed, and are put into ſuch Paper Dripping-Pans, or Troughs, as they were bred in. There they will couple, and lay their Eggs; when that is over, the Papers with the Eggs upon them (never attempt to take the Eggs off) are to be put into a Cheſt or Trunk one upon another, and without any other Art or Means; there let them remain till the next Spring.

Note, I am very credibly inform'd, of ſome Ladies in *England*, who keep great Numbers of Silk-Worms, that beſides the Pleaſure they take in feeding and obſerving theſe wonderful Creatures, make uſe of the Silk-bottom, which they cut (after the outer Sleave or Down is off) into artificial Flowers to wear in their Heads, which they themſelves paint and colour, to imitate Nature, and is thought to be the moſt fitting thing in being for that purpoſe.

Some Inſtructions for the Increaſe and Planting of Mulberry-Trees.

What Ground is fit for the Mulberry-Seeds, *how the ſame is to be ordered, and in what manner the Seeds are to be ſown therein.*

THE Ground which ought to be appointed for this Purpoſe, beſides the natural Goodneſs of it, muſt be reaſonably well dunged, and withal ſo ſituated, as that the Heat of the Sun may cheriſh it, and the nipping Blaſts of either the North Wind, or the Eaſt, may not annoy it: The Choice thereof thus made; that the Seeds may the better proſper, and come up after they be ſown, you muſt dig it two Foot deep, breaking the Clods as ſmall as may be; and afterwards you may divide the ſame into ſeveral

Beds

Beds, of not above five Foot in breadth, ſo that you ſhall not need to indanger the Plants, by treading upon them, when either you water or weed them.

THE Mulberry-ſeeds you may lay in Water for the ſpace of twenty-two Hours, and after that you may dry them again half dry, or ſomewhat more, that when you ſow them they may not cleave together: Thus done, you muſt caſt them upon the aforeſaid Beds, not altogether ſo thick as you uſe to do other Garden-ſeed, and then cover them with ſome fine Earth (paſs'd thro' a Seive) about half an Inch thick. In dry Weather you muſt water them every two Days at fartheſt, as likewiſe the Plants that may come off them; and keep them as clean from Weeds as poſſibly you can.

THE time in which you ought to ſow them for your beſt Advantage, is either in *March*, *April*, or *May*, when Froſts are either altogether paſt, or at the leaſt not ſo ſharp, or of ſo long Continuance, as to indanger their up-ſpring.

THERE is yet another way to ſow them, and that is as follows; you may (being directed by a ſtrait Line) make certain Furrows in the Beds abovementioned, of four Fingers deep, and about a Foot in diſtance the one from the other: After this, you may open the Earth with your Hands, on either ſide of the aforeſaid Furrows, about two Fingers from the bottom, and where you have ſo open'd it, you may ſow your Seeds; and then cover them half a Finger thick with the Earth, which before you open'd.

When the Plants that are ſprung up of the Seeds are to be removed, and how they are to be planted the firſt time.

IN the Months of *September*, *October*, *November*, *December*, *March* or *April* the next Year after the Seeds are ſown, you may remove their Plants, or in the Month of *January*, (if it be

not

not in froſty Weather) and ſet them in the like Beds as before, and about a Foot from one another, but firſt you muſt cut off their Roots about eight Inches in length, and their tops about half a Foot above their Roots, more or leſs, according to the Strength of the ſaid Plants, for the weaker they be, the leſs tops you may leave them. In this manner you may ſuffer them to remain, weeding and watering them (as need ſhall require) till they be grown ſix Foot in length above their Roots, whereunto when once they have attained, you may cut their tops, and ſuffer them to ſpread, always having a care to take away the many Branches, or Suckers, that may any way hinder their Growth, until they be come to their full length of ſix Foot, as aforeſaid. Obſerve to ſet the Plants (whenever you remove them) always in the ſame Poſition as they grew, that is, the ſame ſide towards the Sun.

When and how the Plants are to be removed the ſecond time, and in what manner they are to be planted where they ſhall remain.

IN the Months aforeſaid (according as your Plants are grown ſtrong) you may remove them either into the Hedges of your Fields, or into any other Grounds. If in Hedges, you muſt ſet them ſixteen Foot from one another: If in other Ground, intending to make a Wood of them eighteen Foot at the leaſt. But a Month before you remove them, you muſt make the Holes (wherein you purpoſe to ſet them) about four Foot in breadth, and ſo deep as that their Roots may be well covered, and half a Foot of looſe Earth left under them, having always a ſpecial care ſo to place them, that they may receive the Benefit of the Sun, and not to be ſhadowed or over-ſpread by any neighbouring Trees.

F I N I S.