

T H E

Practical Bee-Master:

O R, A

TREATISE,

Wherein the Management of BEEs, both in common Hives, and in the Colony Way, without killing them for their Honey, is, Step by Step and on all probable Occurrences, better and more particularly directed, than in any Book hitherto published.

By ROBERT MAXWELL of *Arkland*, a Member of, and Secretary to, the Honourable, the Society of Improvers in the Knowledge of AGRICULTURE in *Scotland*.

*Protinus aërii Mellis caelestia Dona
Exsequar : hanc etiam, Mæcenas, aspice partem.
Admiranda tibi levium spectacula rerum,
Magnanimosque Duces, totiusque ex ordine gentis
Mores, & studia, & Populos, & prælia dicam. Virg.*

E D I N B U R G H,

Printed by ROBERT DRUMMOND, and Sold by the Bookfellers in *Edinburgh*, and other Towns; and at Mrs. MAXWELL'S Shop, betwixt *James's* and *Wardrop's* Courts, in the *Lawn-Market* of *Edinburgh*, where the Author may be found, or Letters to him may be directed.

M D C C X L V I I.

This Book is entred in STA-
TIONERS HALL; and fur-
ther, to prevent Pyrating, I have
signed each genuine Copy, on
the Back of the Title Page.

R. Maxwell

UNTO THE RIGHT HONOURABLE,

JOHN Earl of **STAIR,**

Viscount DALRYMPLE, Lord *New-*
tiston, Glenluce and Stranraer;
Field-Marshal of His Majesty's
Forces, General of Marines,
Governor of the Island of *Mi-*
norca, Colonel of His Maje-
sty's Royal Regiment of *North*
British Dragoons, one of His
Majesty's most Honourable Pri-
vy Council, and Knight of the
most ancient *Order of the*
THISTLE, &c. &c.

My LORD,

IF none excepted against Books, but such as
could amend them, such Censure would be
commendable; but many cavil only to gratify
their captious Humours; hence it is, that Wri-
ters dedicate their Books to the Great for Pro-
tection,

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tection, and that the Rays of their Patron's Glory may communicate Light to their Labours; so I most humbly address You, my Lord, YOU who have gained *Great Britain* as much Honour by your wise Negotiations, as any Ambassador ever did before, or has done since you were so employed; YOU who have evidenced that You are both a consummate Statesman and General, equally well qualified for the Council and Camp; YOU whose Name and Memory will be sacred in all future Records, for Valour, Wisdom and Success: But, which is still more Honourable, if any Thing can be more Honourable than these; upon YOU, who have proved, that You're a Lover of Husbandry, and a Notable Husband-Man, which makes YOU the more natural Patron of this my Treatise.

THE Policy of States is generally to enlarge their Territories; Wars are always attended with the Destruction of Numbers of People, and many other Calamities; but Improvements in Husbandry are more profitable for *Great Britain* than Conquests. Husbandry is the Life and Support of the whole People, from the King to the Beggar. *The Profit of the Earth is for all, the King himself is served by the Field*: Husbandry is also the Life and Support of all Arts and Sciences: Our Manufactures and Trade depend upon it, and subsist by it: They can only flourish in Proportion as it succeeds: It furnishes the Materials for both: It is the Stock, and they are only the Improve-
ments

ments of it. The Practice of it procures a robust Constitution of Body, which enables Men to perform great Actions ; it increases the Strength of the Labourers, and renders those who work at the Plough, robust and hardy, by inuring them to the Inclemencies of the Seasons, the Colds of Winter, and the Heats of Summer, and by obliging them to rise early, and to keep themselves always employed.

If at any Time our Country should be invaded, they, more than other Men, are excited to defend it : For, when other Things may be hid, their Corn and their Cattle must remain exposed in the Fields, to be carried off, or destroyed by the Invaders ; and as they will be more forward, they will also be more able, than any other Set of Men, to do it, and, by their own Strength and Courage, to take Revenge : So Husbandry ought to be held in great Esteem by all Governments : It furnishes them with the best Subjects, and such as are most studious of the publick Good ; for which Reasons there is no Art, no Science, so honourable, so useful as Husbandry.

Y O U R Lordship has indeed learned the Principles of it, by the superior Strength of Your own Understanding, tho' You could find no University in which it is taught ; but surely 'tis for Want of Teachers, that the Generality of Farmers are so shamefully, so miserably Ignorant of this their Business, the chief of all earthly Concerns. May we not therefore complain with *Columella*, and others

VI DEDICATION.
thers since, that all other Arts and Sciences, even such Vanities as Dancing, have publick Schools and Masters, and yet that we should have no Professor of so Pleasant, so Virtuous, so Honourable, and so Necessary an Art as Agriculture. He cried out, 'O Husbandry, thou that art so nearly related to Wisdom, thou alone has neither Masters nor Scholars!' May not we do so too, since the Case in his Time and ours is the same? How then could a great Man do a greater publick Good, or add any greater Glory to his Character, than by promoting the Establishment of an University of Husbandry, or of a general Director, or Directors of Agriculture?

YOUR Lordship's Knowledge is not lost, but highly useful to Society. You teach us daily by Your Noble Example, and, besides what otherways drops from Your Bountiful Hand, You relieve the Poor by employing them at your Works. If every great Man bestowed his Money as You do, the giving them Places with great Sums would be a publick Advantage, and the more they got, if it was not highly excessive, the Kingdom would be the more benefited.

To particularize only your Husbandry Works, by which You have taught us, and are still teaching us, better Methods than we know, or knew before, even those hinted at in my DEDICATION of the select Transactions of the Society of Improvers, would swell this Letter to an uncommon Length, wherefore I will endeavour to hold my Hand, tho'
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the Force of Truth and Justice to Your Lordship's Merit are pushing me on.

I have tried to restrain myself, but I find I cannot, until I observe from what I have said, that You are surely a most happy Man, my Lord, for You have won the Blessings of the Poor, have commanded the Esteem of all Ranks, and have even laid the whole Kingdom under a Load of Obligations to You, by Your glorious Conduct on all Occasions. When Men have a Mind to glory, why do they not seek it in applying their Minds, as your Lordship has done, to do good?

IT is impossible, my Lord, I can have given Cause to accuse me of Flattery, all I have said being strictly true. On the contrary, I ought to have said more, since I adventured to say any Thing; for who won't see, that I leave untouched the most shining Parts of Your Character; PARTS for which every *Briton*, who loves his Country, will in Ages to come, pay Honour to Your Memory. As an Apology for this Neglect, I plead, first, my Fear of offending Your Modesty; next, my Inability to describe them properly. If I touched them, my Fingers might sully their Lustre, for he who praises amiss, lessens whom he would commend: Left I should fall under that Censure, I am obliged to draw a Veil over what I have despaired of being able to represent. But,

UPON the whole of Your Conduct, without going further into Particulars, I must still observe, that it is by all acknowledged, that you have walked steadily in the Paths of Virtue, the cardinal Virtues, thro' all the Stages of Your Life, wherefore we honour and esteem You as much as we can. I beg Your Patronage, and pardon for presuming to take this publick Occasion to subscribe myself,

MY LORD,

Your Lordship's,

Most obedient,

And most humble Servant,

ROB. MAXWELL.

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T O T H E

R E A D E R.

TH^O I intended, by the Introduction, to have saved you the Trouble of a Preface; yet, I think, it may not be improper to offer you this. Pray, allow me to shew you a Reason, why a Book deserving the Title of, *The PRACTICAL BEE-MASTER*, was exceedingly wanted, for to palm useless Books upon the Publick, is a Crime of a very heinous Nature, a Robbery of every Purchaser. The Reason is short. There was no Book, that I could see or hear of which deserves the Name; none of them directing the Husbandry of Bees, in many difficult Cases which often occur.

To help me to make this appear, I shall use the Words of the Author of the Natural History of Bees. Surely he ought not to complain, that I take from him, and use his Words, since he says, "I have taken ALL the Materials from M. De Reaumur," the Author of Nature displayed; and adds, "I have preserved as far as possible his Terms and Expressions."

"The practical Reasons, says he, for the Success of Bees are nothing more than the Knowledge of their Wants; and these Wants cannot be known, if one is not acquainted, with the utmost Exactness, of their Method of living, their Temperature, their Nourishment, the Dangers to which they are exposed, the most favourable Situation they can be placed in; if one knows not how to make them change their Habitation, &c.

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THE HISTORY OF THE
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“ The Ancients have loaded their History of Bees
“ with so many Fables and Absurdities, that it is
“ not at all strange, if the Prejudices, which arise
“ from these false Representations, have retarded
“ the Progress, which might otherwise have been
“ made, on the training up of Bees.

“ To inforce this profitable Art, and to render
“ it capable of the highest Perfection; it was ne-
“ cessary, that somebody should give himself the
“ Trouble, to make Bees his Study more than the
“ Ancients had done. This has been effected in
“ our Time; and we are indebted to three cele-
“ brated Authors. *Swammerdam* is the first, who
“ applied himself, with all that Knowledge, of
“ which so great an Anatomist was capable: But his
“ Studies and Discoveries go not far beyond the in-
“ terior and exterior Parts of these Animals; their
“ Generation and their Food: His Design not ex-
“ tending to what might be useful either to preserve
“ or multiply them. In short, his Work, wrote
“ in *Latin* and *Dutch*, is of no Service to the
“ Persons we have in View. The late *M. Ma-*
“ *raldy*, like the Gods of the Poets, who some-
“ times quit Heaven to amuse themselves with ter-
“ restrial Creatures; *M. Maraldy*, I say, diverted
“ himself, amidst his Astronomical Observations,
“ with the Study of Bees. This Author has left
“ us a very minute History of Bees, accompanied
“ with many Observations and Discoveries. It is
“ to be found in the Memoirs of the Academy,
“ and consequently beyond the Capacity of those
“ Persons, who have the most need of it. Be-
“ sides, this Author, as well as *Swammerdam*,
“ gives no Rules for the training up of Bees.
“ They are both satisfied to examine them as Na-
“ turalists. At length *M. De Reaumur* uniting
“ the

“ the Discoveries of all his Predecessors to his own,
 “ has lately obliged us with a new History of these
 “ Animals; which one may consider as the most
 “ compleat and perfect Work, in all Respects,
 “ that can be hoped for of this Kind; as well with
 “ regard to the *Natural History of Bees*; as to the
 “ new and easy Methods, there proposed; for
 “ their Increase and Improvement. This Tract
 “ is found in the 5th Volume of his *Memoirs in-*
 “ *tended for the History of Insects*; a Work,
 “ which for the Price, Bulk, and extensive Learn-
 “ ing, seems only fitted to the Capacities of the
 “ Learned and Curious.

“ Thus the Destiny of Bees has this in particu-
 “ lar, that all those, who have most successfully
 “ interested themselves for them, who have best
 “ known them, and who have treated of them the
 “ most learnedly, and with the greatest Exactness,
 “ have not wrote but for such, who have it not in
 “ their Power to profit by their Discoveries, and
 “ Lectures, and have no real Relation to Bees:
 “ Whilst those who breed them, and who might
 “ make their Advantage of them by enlarging
 “ Commerce, have scarce any Knowledge of
 “ them.

“ This Reflection has given me the Notion of
 “ making those Discoveries and Improvements
 “ more general, which seem locked up in the Ca-
 “ binets of the Learned; and to place before the
 “ Eyes of all those who have any Desire, or any
 “ Interest to be acquainted with them, the most
 “ proper Means to bring up these Animals, and
 “ to enlarge the Commerce of Wax.

“ 'Tis with this View, and for these Persons
 “ only, that I have attempted this History of
 “ Bees, I have taken all the Materials from the
 “ *Memoirs*

4 THE PREFACE.

“ *Memoirs of M. De Reaumur.* One will be easily persuaded, that I could not draw from a purer, or a more copious Source.

“ As my only Aim was to make myself useful, I have made no Scruple to make use of the Observations, Remarks, Experiments and Discoveries, which have already been made upon Bees by others; and have likewise employed their Descriptions, such as I found them, either entire or abridged, and sometimes by enlarging them, when I was certain of not exceeding the Bounds of Truth. To what *M. De Reaumur* has said, in his Memoir concerning Bees, I have added every Thing which had Relation to that Subject, which is found in his other Memoirs. I have preserved, as far as possible, his Terms and Expressions, being persuaded, that when Things are well expressed, an attempt to express them otherwise, is almost an inevitable Risk to express them ill. If my Conduct, in this Particular, had need of an Example to authorize it, I could cite that of *M. Rollin* in his ancient Greek and Roman History.”

You see the Author of the Natural History has told us, that the Ancients had loaded their History of Bees with many Fables, Absurdities, and false Representations, and that no French Author, not even *M. De Reaumur* in his History of these Animals, “Tho’ he had united all the Discoveries of his Predecessors to his own, had wrote but for such, who have it not in their Power to profit by their Discoveries and Lectures, and have no real Relation to Bees, whilst those who breed them, and might make their Advantage of them by enlarging Commerce, have scarce any Knowledge of them.” Now,

How

How could this Author of the Natural History, make his Book more useful than M. De Reaumur's since he has acknowledged, that he took "All the Materials from his Memoirs;" and since you observe, that he does not so much as pretend, that he himself has made the least Discovery?

I will add, that he has neglected to direct the Bee-Farmer, how to conduct himself in Multitudes of difficult Cases, which often occur, and stuffed his Book with extraneous and extravagant Matters; as these who read my Books, and particularly the Appendix, will, I believe, be fully satisfied.

Where, then, was a Book to be found, that could direct the Bee-Farmer on many probable Occurrences? Not in France; and, I believe, I may pass over all that has been wrote upon the Subject in England, except Dr. WARDER's Book. In my Opinion it was the most useful of any; and yet, as I have observed while treating the Subject, and will be farther observed, by such as have read his Book, and shall read mine; his is in many Cases deficient, and in some arroneous.

If the Matter stood thus; if there was no Book, to direct the Bee-Farmer in a great many difficult Cases, which often occur, and in which, I hope, I have now taught him, how to conduct the Husbandry properly; and, if I have, more fully than any other, "Placed before the Eyes of all those, who have any Desire or Interest, to be acquainted with Bees, the most proper Means to bring up these Animals, and to enlarge the Commerce of Wax," as the Author of the Natural History has said, but, I humbly think, has not supported or made out; Then, may not I, without Arrogance, plead that I had a Right to give the Title of THE PRACTICAL BEE-MASTER to my little Book.

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If any Body shall be of Opinion, that I have here, or any where; spoke more favourably of my Performance, than Modesty allows; I beg Leave to put him in Mind that Plutarch, having wrote a whole Chapter of his Morals, upon the Question, "How a Man may inoffensively praise himself without being liable to Envy?" In discussing of it, says, "Yet, however; there is a Time when a generous and prudent Man may be the Subject of his own Discourse; and give a free Relation of Things he has worthily done or said; as well as other Truths." This Time is the more proper for me to make these Observations, that some of the Sheets having been seen before the rest were printed, a frivolous and useless Exception has, already, been publicly made against my Book: What it was, and the Remarks I have made upon it, you will find in the Appendix, to which that Exception gave Occasion.

I conclude with an Acknowledgment, that two or three Gentlemen, whose Names, if I had Allowance, I would mention, assisted when I revised my Manuscript. I have gathered from the Living and from the Dead, as all Writers; whatever some may pretend, have done, or should have done; and, like the Bees I have treated of, I have sucked, for you, from every Flower, I thought for my Purpose. In particular, I have been assisted by a small Manuscript, which was put into my Hand by the ingenious Mr. Hope of Rankéiler, and by another Copy of the same Treatise, with some few Additions; from another Person. Since I have taken the Freedom to mention Mr. Hope, I cannot in Justice omit to say, that his Name should be transmitted to Posterity, for the Love he has shewn to his Country, by greatly promoting Improvements in Husbandry
and

and Manufacturers. You see I'm far from alledging all is new, or all is my own, yet I only do myself Justice in saying, that I have been attentive, laborious, and made all the Discoveries I could, and no doubt but, being little more than a Beginner at the Writing Business, I have, as a Poet says, been obliged to

Blot out, correct, insert, refine,
Enlarge, diminish, interline;

But I think all my Pains well bestowed, since now I can promise you, that you'll find in this Book, tho' small, many necessary Directions, which I do not remember to have seen in any other.

ADVERTISEMENTS.

MR. Maxwell has been employed by Noblemen and Gentlemen, to survey and plot their Estates, or Parts thereof, and to give his Opinion concerning the Improvement of the several Soils; and, whereas the Memorials he has wrote, and every other Thing he has done on these, or any of these Occasions has, so far as he knows, given full Satisfaction to his Employers; these are to give Notice, that he is resolv'd to serve, when called upon for any of these Purposes; and that he may be heard of at any of the Coffee-Houses in *Edinburgh*, but more probably found at Mrs. Maxwell's Shop, betwixt *James's* and *Wardrop's* Courts in the North-side of the Lawn-Market of *Edinburgh*; and also, that Letters left for him at the said Shop, will go to his Hand, tho' he happen to be out of Town, and will be duly answered, Postages being paid.

It being known, that Mr. Maxwell is acquainted with many of the best Improvers in the Knowledge and Practice of Agriculture in *Scotland*, he is often applied to by

by Gentlemen, to find them out Tenants or skilled labouring Servants, and by Farmers to let them know, where improveable Farms are to be set; therefore, that he may be the better enabled to serve those severally, he will very willingly receive from Gentlemen, Memorials concerning such Farms, and the Qualifications which they want Servants to have; and Accounts from Tenants of the Farms they incline to have, and also from Servants a Note of the Service they are qualified for; the Recommendation they can bring, and the Encouragement they expect.

The first Edition of the select Transactions of the Honourable the Society of Improvers in the Knowledge of Agriculture in *Scotland*, published by Mr. *Maxwell*, being near sold off, a second Edition thereof enlarged, will soon be published, and Sold at Mr. *Crawford* Bookseller, his Shop in the *Parliament-Close*, and at Mrs. *Maxwell's* Shop before mentioned, at Two Shillings each Copy, cheaper than the first Edition sold, viz. at Four Shillings stitched, and Five Shillings bound in Calf and titled; and if Mr. *Maxwell* meet with equal Encouragement by the Sale of this Treatise, as he got by the said select Transactions, for which he returns every Purchaser his most hearty Thanks; he purposes at no very distant Time, to offer another Tract upon the Subject of Husbandry: So if Gentlemen will be pleased, to give their helping Hands to the Service of their Country in that Way, by sending him Memorials; if he shall find it proper to publish the same, all possible Justice and Honour shall be done to such Gentlemen, but their Names shall not be mentioned if they discharge it.

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PRACTICAL BEE-MASTER, &c.



HUSBANDRY consists of many Parts, the more profitable the more they are conjoined, the more they are made to assist one another: All of them require Knowledge and Care in the Management, but some of them more Labour and Expence than others, and some less; of the last Sort is the Husbandry of Bees: None of them can be so generally, and on so small a Stock, so profitably followed as this. For,

2. Every Man or Woman, who has only a House and a Yard, and Money to buy one single Hive, who knows how to manage these laborious and profitable Creatures, and who will adhibite due Care, may, after a few Years, raise a considerable Sum yearly out of this very Article alone; and may, nevertheless, carry on other Business, without any considerable Interruption by the Bee Husbandry.

3. The History and Husbandry of Bees is one of the most curious and entertaining Subjects, and has employed the Pens of the ablest Writers in different Kingdoms and in different Ages; but had these Writers omitted many unnecessary Speculations, and only, less intent on Theory, offered more and better practical Rules for the Management of these highly beneficial Creatures in all probable Occurrences, it cannot be doubted, but that

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the Bee-Husbandry would have been more general, and more profitable to those who practise it; That Honey the *Sugar of the Ancients* would, ere now, have supplied many of our Uses of Sugar; Mead, or *British Canary*, of *French* and *Spanish Wines*; and that we might have had sufficient Quantities of Wax, not only for Home-consumpt, but likewise for Export: To prevent these Inconveniencies on the one Hand, and to obtain those Advantages on the other, is the Design of publishing this Treatise.

4. Bees are of three distinct Species or Kinds. The *Sovereign-Bee*, the *Working-Bees*, and *Drones*: Of *Sovereigns* there is only one permitted to remain in every Hive, except young ones, until swarming, for *Sovereigns* to other Hives; on this *Sovereign* the Good of the whole Family or Society depends, for, if removed, or killed, the whole Hive goes to Ruin: Tho' 'tis a Matter of small, if any Consequence, whether this *Sovereign* is Male or Female, *King*, or *Queen*, yet as possibly it may divert my Reader, I shall give my Sentiments about it, and my Reasons.

5. Dr. WARDER pretends to have dissected *Bees*, and, by the Help of his Glasses, to have discovered their Organs of Generation, whereby he says, he found the *Sovereign Bee* to be a Female, all the *Working-Bees* to be her Female Subjects, and the *Drones* to be the Male Bees; and hence it is, that, according to his Notion, the *Sovereign* being a Female, and all the *Working-Bees* her Female Subjects, carrying Arms for the Defence of their *Queen*, and her Government, he calls it the *Amazonian Government*; the *Drones*, called by him the Males, having no Sting.

6. The Doctor found a Conveniency in maintaining that this *Sovereign* was a Female: He dedicated his Book to the *Queen*, and told Her, *The Queen-Bee governs with Clemency and Sweetness, so dath your Majesty, she is obeyed and defended, out of Choice and Inclination, by her Subjects, so is your Majesty; for all the thousands of your Brittannick Israel Esteem your Majesty's Person as sacred,*

sacred, and scarce such a Villain is among us, who would not lose his Life in Defence of your Majesty: You see, he has made a proper Use of his *Queen-Bee*, and taken her Assistance to make out these fine Compliments.

7. The greatest Part of the Writers on this Subject, having been of the Opinion, That the Sovereign was a Male, and that it is by Virtue of this King, that the Working-Bees, who are Females, are impregnate; the Doctor makes merry, and says, *'Tis too mean an Office for him to be the common Bull of the Herd.*

8. I won't positively contradict what the Doctor pretends to have seen, since I have not dissected these Animals, as he has done; yet I cannot help being of the Opinion, That, as I have said, was generally received before the Doctor wrote, until I see with my own Eyes, Cause for altering my Sentiments, or find the Reasons I offer, against what he says, satisfiingly answered: They are,

9. *1st.* Government by a King seems to be the most natural Kind of it.

10. *2d.* This Bee by Bulk and Strength seems to be a Male, for every Body who has seen him engaged in Battle against stranger Bees, will have observed him kill a great many of them!

11. *3d.* What the Doctor ridicules, seems to have more Weight than he is aware of, and perhaps is the principal Cause why they bear so true Allegiance to him, and hazard their Lives so freely in his Defence; for, in my Opinion, 'tis natural to think, that the Instinct those Creatures are endowed with, of being solicitous to preserve their Sovereign, more probably proceeds from his being the common Father, than because he is the common Defender of the Society.

12. I suppose none will deny, but natural Children are more engaged in Affection to their Parents, than Political Children are to theirs, and it is, perhaps, because this Sovereign is both Natural and Political Father, that their Love to him is so great.

13. If it be objected, that it is not easily to be imagin-

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ed, how this Sovereign can be a Natural Father to so many, I answer, That any Body who has thought of the Propagation of Insects, will not think this strange: For Example, Let us but consider the Silk-Worms, after they have taken on the Form of Butterflies, what a Multitude of Eggs will be laid in, one Day by one Female, all impregnate by one Male; But,

14. 4th. The *Doctor* by supposing the Drones to be Male, brings himself under this Inconveniency, of asserting that the Females are all impregnate, seven or eight Months before they lay their Eggs; for I believe, all know that the Drones do not survive the Month of *August* or *September*.

15. 5th. The *Doctor* says, when giving his Judgment about killing the Drones, That this is not to be done, till the Working-Bees begin to do it themselves, and alledges, That you may as well kill all the Rams of your Flock, and look for Lambs from your Ewes, as you can expect that Hive of Bees to thrive next Summer, the Drones whercof you have killed this; but, I beg the *Doctor's* Leave to tell my Readers, That a curious and ingenuous Bee-Master informs me, that, for a Trial of this, he has begun early in the Month of *June* to kill the Drones of an Hive, and has continued so to do, from Day to Day, until he could find no more to kill; and that he was very positive, that few, if any, escaped his Knife, and that yet, that Hive was as forward and thriving next Spring as any other, whence it may be concluded, that another Father, than the Drones, must be found out, for the next Year's Brood.

16. 6th. The last Argument, which I advance to prove this Sovereign to be a Male, is, That when an Hive loses this Bee, they never increase any more, but daily diminish till they dwindle to nothing. I know it will be objected, that this does not prove the Alledgeance, because, according to Dr. WARDER, an Hive or Swarm of Bees, do nothing at all after they lose, or are robbed of their Sovereign.

17. To which I answer, That the *Doctor* is there speak-

speaking of a new Hive, about which he has made very considerable Discoveries, as shall be taken Notice of afterwards, but an old Hive and a young one differ: Whatever Disorder or Discontent an old Hive may shew, yet they do not take it so much to Heart as a new Swarm does, but will continue as long as they live, to carry in Honey to their Hives, tho' they never work upon their Thighs, knowing it is fruitless to make any Attempt for Propagation, when the common Parent is gone.

18. Thus I have known them all gradually die away, and yet leave a considerable Deal of Honey, which accounts for Bees their forsaking their Hives, without being any Way disobliged, so far as can be understood, and yet leaving Plenty of Provision behind them, which frequently happens, so I must be allowed to call their Sovereign a King, until these Objections are answered.

19. But, if it be enquired what is the Use of these Drones, and how are they propagated? I answer, That, their Use seems to remain still a Secret, but I make no Question that they have Male and Female among themselves: Nature has, no doubt, made them for some Use, and yet I could never find any Man who could satisfy me what it was: Some alledge that they assist in hatching the young ones, for being bulky, and sometimes very numerous, their Warmth does not a little contribute to the cherishing of the Brood; but how answer they this Objection, viz, What Way is the Hatching of the Young performed in *Aprik*, when the Weather is cold, many of the Bees dead in Winter, and not a Drone to be seen in the whole Hive?

20. I thought to have left this Argument, in my Opinion more amusing than useful, with this further Observation on Dr. WARDER's Opinion, that even he himself, speaking of the Drone, is obliged to confess, That it is only molt probable, that he is of the Male Kind, and that his being subject to the other Bees, is an Argument against him: Now, if the Drone is not the Male-Bee, then there is none, according to his Doctrine; but the natural History of Bees, as translated from the *French*,
and

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and the Female Monarchy by the Rev. Mr. *Thorley*, both published in the Year 1744, falling into my Hands; these I cannot pass over without Remarks on what they say, concerning the Sex of Bees.

21. In the Natural History mentioned, a Dialogue betwixt *Eugenio* and *Clarissa*; *Eugenio*, says he, opened the Sovereign Bee anatomically, and assisted *Clarissa* by his Glass, to see that she, the Sovereign Bee, is the fruitful Mother, that the Drones are the Males, and that the Working-Bees are of no Sex: Dr. WARDER says they are Females: What shall we believe?

22. The Clergyman gives us the Opinion of many Authors, as to the Sex of Bees, and their Manner of Procreation, and makes such Observations on them severally, as he thinks may best suit his Purpose; thereafter, *From the Premises*, says he, *may we not justly draw this Conclusion, That the Drones are not the Males, neither have they any Instrumentality or Agency in the Generation of Bees?* So far, you may remember, I agree with him, with Respect to the Production of the Working Bees, tho' I doubt not but that, as I have said; there are both Male and Female Drones, and that they breed by Copulation with one another.

23. *If this Point*, says he, *is yielded to, then*, he says further, *I am most fully perswaded that they do not breed by Copulation, the common Bees being neither Males nor Females, and the Sovereign being Female; and the only Female.*

24. I desire you may remark what he comes to at last: *After all that has been offered on this Head*, says he, *it seems to be a mute Point that will admit of a further Dispute; as I cannot attain to a full Satisfaction therein myself, How can I expect that my Arguments should administer the same to my Reader, whom I must leave to his own Judgment and Choice?*

25. Now, after such a Concession, What can we think he aimed at? Does the Clergyman doubt, that all living Creatures were created Male and Female? Does he doubt, that the Males and Females of all living Creatures

tures were preserved in the Ark? If they were, I wish he had told us what has destroyed all the Male Bees since; but, strange! Would he have us to believe, that a Female Bee can carry on the Work of Generation, any other Way, than by the Assistance and Co-operation of the Male.

26. I shall next give you a more particular, tho' short, Description of every particular Species of them, because this Treatise may fall into Hands who have not, or want Money, to purchase Books, that describe them.

27. The King is considerably larger than the Working-Bee, but smaller than the Drone; He's broad-shouldered, his Legs are somewhat red, and his Train is long and taper, which makes his Wings look somewhat short in Proportion to his Body; His Sting is also shorter than that of the Working Bees, tho', as was hinted before, he knows well how to use it when Occasion requires. In Conclusion, he has so much Majesty about him, as plainly distinguishes him, at first View, from the rest.

28. As to the Working Bees, they being so well known, I need say nothing about them; the Drone is as large as two of them, but very clumsy, and has no Sting; any Body may satisfy their Curiosity about the Drones, if in the Summer-time they go to an Hive, betwixt Eleven o' Clock in the Forenoon and Two in the Afternoon, then they will come abroad in great Numbers, and fly about, making a buzzing Noise; it is indeed very hard to get a View of the King, for there being but one in an Hive, and he coming seldom abroad, it is difficult to nick the Opportunity of seeing him, tho' it is no Rarity to get a Sight of him when dead; for if any will take the Pains to turn over the dead Bees, of an Hive that has been smoked, they will scarce miss to find him, or when two new Hives are put together, by turning the Mouth of the one upon the Mouth of the other, as shall be taught hereafter, you'll very often find a dead King lying in the Bottom of the empty one, but he's then seen greatly to the Disadvantage, Death having

ing disfigured him, yet his Corps may be easily distinguish'd.

29. Having so far satisfied my Readers Curiosity, I shall now proceed to instruct, how to manage every Step of this Husbandry, so as the newest Beginner may find both Profit and Pleasure, in the Study of these wonderful Animals, and reap the Benefit of every Year's Labour: This is what I chiefly intended, tho' it will afterwards fall in my Way, to treat more fully of the curious and speculative Part. But, as I think, others have made the Theory their principal Study, I resolve to be the more practical; and, that I may avoid the common Error, as much as possible, I shall relate many Circumstances, neglected by others, tho' absolutely necessary to be considered, and shall give particular Directions concerning them.

30. He who intends to be a Bee-Master, should buy a Top Swarm in the End of *August*, or Beginning of *September*, when they have given over Working: Here you must take Care to avoid the general Mistake, which is, That the Hive, which is neither too light nor too heavy, is fittest for keeping. These who are of this Opinion, maintain, that the Hive that has too much Honey over Year, is indifferent and lazy in the Spring, and does not set out to work briskly; and one, say they, that is too light, will, unless supplied, perish in Winter for Want of Food.

31. This Assertion concerning the light Hive is certainly true, but the other is not so, for the more Honey an Hive has, if there are Bees in Proportion in it, the more brisk and forward will they be in the Spring, tho' one that was but of a moderate Weight may, in some Seasons, do as well as one that was heavier; yet that rarely falls out; it much oftener happens, that the heaviest of all will be pincht, and that those that were thought heavy enough, must be fed, or die.

32. The Reason why a lighter Hive does sometimes as well as a heavier one, is, if the Spring is good and early, and a continued Tract of good Weather follows, then

then the Hive, that had only a short Allowance, does not come to know what Famine is; but a greater Paradox than this is, the Lightest sometimes outstrips the Heavier, and comes to good Account, when the other dies for want of Food; but this falls out rarely.

33. The Case in which it happens, is; when the Weather begins to be tolerably good, in the End of *March* and Beginning of *April*, then the strong lively Hives set out to work, and immediately begin to hatch a new Brood, which, toward the End of *April*, come to require a great Deal of Food, so the Remains of the Winter Provision must go for their Maintainance; and then if the Weather is so bad in *May*, that the Bees cannot go abroad for a Recruit, their Provision falls short, their Family being so numerous, so unless they be taken Notice of, and fed, they must die, while the Weaker and less forward Hives are living moderately, with a small Family upon their Winter Stock; but, as I said before, this rarely happens, so it ought not to be established into a Rule, and therefore from what is said, I think, 'tis plain, that the heaviest Hive is the fittest for keeping, tho' Dr. WARDER be of another Opinion.

34. That you may know, when an Hive is heavy enough for keeping, or whether the heaviest you can find be sufficient; take the following Directions.

35. A Top Swarm, in one of the ordinary Sort of the Bee-hives used in this Country, which will hold about one Peck, three Lippies of Barley, *Linlithgow* Measure, if it be hived, or cast, as we call it, before the 10th of *June*, will probably be a sufficient one for keeping, and weigh about Thirty, or Thirty two Pounds *Dutch* Weight; It is perhaps the Shortness of the Winter in *England*; that makes Mr. WARDER propose keeping of them, when they are only Twenty five Pounds: If the Hive you are to buy is in a Place of the Country, where Hives, larger than the common Sort, are used, you should take Care that it be so much heavier in Proportion.

36. I have tried the Weight of some Hives, and I have found them to be Sixty four Pounds a-piece; and

upwards; in each of which I conclude there was near Ten Pints of Honey, *Scots Measure*, allowing Five Pounds for each Pint, and about Fourteen or Fifteen Pounds for the Weight of the Hive, and Wax, with the Refuse; and so I reckon an Hive of the ordinary Size, I mentioned, weighing Thirty two Pounds, will have upwards of Four Pints of Honey in it, which will seldom fail to keep over Year, and one weighing less, runs a Hazard.

37. The Way of weighing them, is this, Take a thin Deal-board, and in the Evening lift your Hive, set it on the Board, put small Earth all round the Hive, to keep the Bees from coming out, stop the Entry with Grass or Fogg, carry it gently on a Hand-barrow, or any other Way to the Place for weighing it, put the Deal-board along with it into the Scales, so weigh it; and when you have carried it back again, you may weigh the Board separately, to know how much you are to discount for the Weight of it.

38. When you have purchased an Hive, according to these Directions, remove it about the Beginning of *September*, or sooner, if the Bees have given over working, and before the Weather grows cold, for when they are taken to a strange Place, they go abroad, and fly about to be acquainted with it. If the Weather is bad, while they are thus employed, many of them die. Here, by the Way, I advise you to disturb them as little as possible, during the Winter, for it does them much Mischief, if they are then disquieted, especially if they are provoked to crawl abroad, for they are not able to get in again, but perish with Cold, or, tho' able to return, are seized with Sickness and Diseases, and gradually pine away.

39. When the Day begins to lengthen, and the Influence of the Sun is reviving them out of their half-dead Condition, a little Disturbance, to move them to take the Air, is not improper, if the Weather continues warm and kind: But even this is dangerous, for if bad Weather returns, many of them die, being unable to get back, if the Change be sudden, and many of the
Strongest

Strongest which escape immediate Death, take a Looseness, of which they seldom recover.

40. This is best observed if there comes a Fall of Snow, and it frequently comes after the Season is well advanced, then you will see them lying dead, and their Excrements, in brown Spots, along the Surface of the Snow.

41. Here, for the following Reason, it is proper to take Notice, likewise, that they ought not to be suffered to come abroad in Time of Snow, tho' the shining Sun may invite and tempt them. The Sun dazzles their Eyes, amazes and confounds them, so they fall into it, and die presently. The Way to prevent them is herein taught elsewhere.

42. If the Distance is small, you may transport your Hive on a Hand-barrow, as before directed; if it is great, a safe Way is to lay a Cloth over the Mouth of it, every where so close that none of them get out; then you may dispose of it as you please; on a Horse's Neck before a Man, a Pole betwixt two Men, or any Way your Discretion shall direct; if you neglect to purchase and transport in *September*, *April* is the next best Time; but if the Seller hath run the Hazard of the Winter, the Price will be the higher: You'll find Directions for buying in this last Month, when the Management of Bees, at that Time of the Year, is considered.

43. Now, I come to direct your Conduct thro' Winter: To preserve your Hive from Cold, Storms of Wind and Rain, and from Mice, which are great Enemies to Bees, are essential Matters. Because there are different Methods practised, as the different Circumstances of Bee-Masters allow, I shall mention the several Ways which I have observed: If Bees were only to be defended from stormy Weather and Cold, or if they were only to be preserved from Mice, the Matter would be much easier; but when both the Weather and these Vermin conspire against them, the Task is the more difficult.

44. Such as are not Proprietors of Land, or have not Leases for several Years to run, and therefore cannot
reason-

reasonably put themselves to the Charge of Bee-houses commonly thatch over their Hives with Straw, which when the Work is done neatly, and the Straw laid on thick, makes a good Defence against bad Weather; but Mice are very apt to nestle in the Straw, to cut out a Way to themselves, to destroy the Bees, and to consume the Honey. To prevent which, lay the whole Hive over, in *September*, with Plaister-lime, and when it is fully dry, cover it with the Straw; this answers both the Intentions aforementioned; but still this Inconveniency remains, that the Strength or Weakness of such Hives, cannot be right judged of by poising them in one's Hands, and this Way, in a great Measure, frustrates the buying of Hives by Weight.

45. Another Way of preserving Bees thro' the Winter, is by making Covers of Deal-boards for every particular Hive, and liming them all around, clos to the Stone or Board whereon the Hive stands, only preserving an Entry for them. These Covers make noble Defences against Mice; but the Sun soon makes them rent, the Rain gets in, and the Hive grows rotten and mouldy, which exceedingly disoblige the Bees.

46. To prevent this Inconveniency, some make Covers like Barrels, with Iron-hoops around them: These Covers cling, as we say, with the Summer's Drought, then they drive the Hoops strait, which makes them tight again; but neither will this do so well as could be wished, for the Winter-rains swell them, and make such a Pressure, as causes the weakest Staves or Boards, of which they are made, to start out of their Places, and so the Rain gets in.

47. A Way, so far as I know, never tried, might be taken by Gentlemen for ornamenting their Parterres; or Flower Gardens; 'tis to make leaden Covers for their Hives; these they might cause cast in different Shapes and Figures, and set them on Pedestals; I know not, how this Proposal will take, but it would please me exceedingly to know, that each of these Ornamental Figures, had a Family of these highly profitable and wonderful living

living Creatures in it; besides, you see it fully removes the Objections; the first two ways are liable to.

48. Other Sorts of Covers are used; but, as I have seen none, that are better than these mentioned; I pass forward to give some few Directions to such as use, or incline to use any of these described.

49. Let such as choise Straw, be sure to put it on thick, and cause it to rise pretty high in Form of a Pyramid, for, if it lies flat, it will not so well defend the Rain; it should be wrapt with a small Cord, and tied down to the Stone or Board, whereon the Hive stands, that it may not be blown away with the Wind, or rub'd off by any Accident.

50. From Time to Time, you should take a narrow Inspection; if Mice begin to lodge in it; to this Purpose you should be frequently pricking it up and down with some small iron Instrument, to try if you can dislodge them; I have sometimes thought, that Tar boiled to such a Consistence, that it would not penetrate too far into the Hive when rub'd with it, might prove an Antidote; I resolve to try it, but, till I find it answer, I don't recommend it as a *prabatum*.

51. Such as resolve to try the Covers, whether Leaden or Wooden, should cause them to be made so large, as they may allow the Hive to be laid over with the Refuse of Flax, commonly called *Pob-tow*, or some such dry Stuff, before the Covers be put on, when special Care should be taken to lime the Entry neatly, that the Bees, going out and in, may find no Passage to lead them betwixt the Hive and the Cover; Covers with dry Stuff betwixt them and the Hives, preserve Bees well in Winter, and the Beginning of the Spring from the Cold; whatever Cover you intend, put it on whenever the Bees give over Work, and while the Weather is dry; for if you cover your Hive when wet or moist, Mouldiness will thereby be occasioned; which, as has been observed, is hurtful.

52. The two Sources that prove most fatal to Bees, and sometimes destroy more than the Half of our Hives in

in one Year, are Cold and Hunger. Whenever the Cold increases, they fall into a Lethargick State, in which they take little, if any, Sustainance, and when it softens, they revive, and their craving for Food returns: Thus the softer the Air continues during Winter, the more Honey the Bees consume, and consequently they run the greater Hazard of spending their whole Stock, before the Flower-season comes round again, so they are in Danger of being starved: On the other Hand, if they are not numerous enough in the Hive, or if the Winter is inclement, they very probably may be killed by the Cold.

53. A certain Degree of Cold in Winter, is therefore favourable for Bees; that which only pinches or benumbs, secures them from the Danger of starving; that which does not pinch them, may occasion their being famish'd, and that which pinches and benumbs them too much, is mortal: Hence it is, that Bees, during severe Winters, are exposed to perish thro' Cold, and in soft Winters to be starved to Death; both which we should endeavour to prevent.

54. When you cover your Hive, make the Entry to it so little, that a Mouse may not get in; if she does, she'll kill and eat all the Bees, one after another, and perhaps not meddle with the Honey, until they are all destroyed. I have known People very much surpris'd, to find a Hive with Plenty of Honey, and no Bees dead or alive in it; from whence they concluded, that the Bees had taken some Disgust at their Habitation, and had gone elsewhere, just as they thought in the Case of the Death of a King, aforementioned; but if you look to the Board or Stone whereon the Hive stood, you'll find it spread over with Wings, Legs, and other small Fragments of the Bees; which the Mice had carried out to eat.

55. The Way which I use to lessen the Entry is this; I take a Piece of Wood square, above four Inches long, and cut a Door-way in it, the Length of three or four Inches, and a Quarter of an Inch or so in Breadth, that

the

the largest Bee may easily pass it. I fix this, with a Needle and Pack-thread, in the Mouth of the Hive made to receive it, and lessen, or thereafter enlarge it, by a Bit of Lime or Clay, according to the Season of the Year, and as I see Occasion for letting out and in the Bees, and debarring the Mice, and other Enemies that go into Hives: Others, for preventing any of them from reaching the Bees, direct the fixing of little Plates of Tin round the Entry, which serve them for Doors, in like Manner as at the Windows of Dove-houses, to prevent Beile-cats from creeping into them.

56. The House-lark, a little dun Bird with a black Bill, the Swallow, Sparrow, Moth, Spiders, Wasps, Hornets, Earwigs or Ermits, Toads, Ants and Snails; are all of them Enemies to Bees, as well as Mice, take all the Ways you can to destroy them. But,

57. Upon this Occasion, I shall here relate a very curious Story from *Spectacle de la Nature*; or, Nature displayed, being a Part of a Dialogue betwixt the *Comte de Jonval* and the *Chevalier du Breuil*.

58. *Count*. "A few Days since a Snail took it into his Head to steal into the Glass-hive in my Window: There was no Entrance to pass thro' but the proper one, and at length in he went. The Porters received him very rudely at the Gate; and the first Attacks they made upon him with their Stings, obliged him to march with more Expedition: But the stupid Animal, instead of retreating, thought to save himself by going forwards; and he advanced into the very Middle of the Hive; upon which a whole Troop of Bees fastned upon him at once; and he immediately expired under their Strokes. The Conquerors were then in no little Perplexity how to get rid of the Carcass, and a Council was instantly held upon that Occasion.

59. *Chev*. "And your Lordship, without doubt, understood all their Debates.

60. *Count*. "From first to last. The most experienced Sages among them reasoned in this Manner: To drag

“ drag the Carcass out by main Strength, is an Impossibility; the Mass is too unweildy, and, besides, the Body is fixed to the Floor of the Hive by its own Glue; and, to leave it where it lies, would be very inconvenient, because it would prove an alluring Regale to the common Flies, and, at the same Time, be liable to Corruption and Worms; and these Worms, when they have devoured the Snail, will infallibly ascend to the Combs, and attack the young Bees. The Damage was evident, and required an immediate Remedy, but you will hardly guess the Dexterity with which they accomplished it. *Chevalier*, I would be glad to know your Sentiments on this Affair. How were they to conduct themselves on this Occasion?

61. *Chev.* “ So quick upon me, my Lord? You are really very severe, to put the Question to me; for it will appear that the Bees had more Presence of Mind than myself. But pray, How did they proceed?”

62. *Count.* “ They incrusted the whole Snail with Glue, and cemented it so close, that all the external Air was excluded; and as no Insect could have Access to deposite her Eggs in the Carcass, so when this should be reduced to Corruption, no malignant Steams would transpire through the Inclosure.”

63. *Chev.* “ Will your Lordship let me see the poor Snail’s Tomb?”

64. *Count.* “ You shall have a Sight of it to-day. It wants nothing but an Epitaph.”

65. For a general Direction where to set your Hives, or build your Bee-house to be after-mentioned, The Place freest from Wind, and most exposed to the Sun, is the best; yet every Place where the Wind does not beat upon the Hives is not so, for they may be set in a Place so wall’d around, that the Wind cannot harm the Bees, while they are within these Walls; and yet, nevertheless, this may be a very improper Situation, for if they have no other Way to go abroad for their Food, but over the Tops of high Walls, the Wind comes upon them

them in a Surprize, beats them against the Stones, and kills Multitudes.

65. Therefore a Place, by Nature or Art, so screened from Winds, (especially the South-west, which is the frequentest and strongest we have) as they can fly, (having the Advantage of the Sun, under the Cover of a Wall, or Planting, or hollow Glen, or the like) to proper Places to feed in, is the best Situation: They'll improve an Advantage of this Kind wonderfully, by flying close to the Ground under these Covers: I would rather want a great Deal of the Sun-shine for Bees, than that they should be deprived of such a Shelter. This Direction is of great Use in high Situations.

66. If the Place have Water-springs, Rivulets, or Ponds by it, 'tis so much the fitter; if there is no Water, but at a great Distance, you must supply them in the Drought of Summer, in a Plate or other convenient Vessel, and Numbers of them will repair to it for Drink; no doubt, to make the Honey and Wax they bring Home in their Bellies of such a Consistence, as they may manage it the more easily: You must be sure to throw some Straw or Grass upon the Top of the Water, that they may pitch upon it, and drink, without being in Hazard of drowning; or an easier and surer Way may be, to sprinkle Water upon the Bushes, Flowers, or Herbs, near their Hives, and they will drink up the Drops greedily.

67. If it be expected, that I should here direct what Plants should be propagated near an Apiary for the Food of Bees; all I shall at this Time say upon this Head, is, the more of the flowering Kind that are planted, and the more differing they are in their Times of flowering, the better, for the Bees will be so much the longer provided; 'tis better to have a Competency for all the Season, than to have a Superfluity for only a Part of it; I know no Flowers they refuse, except of Alder and Rue, according to the natural Historian aforementioned; and with him, I am apt to think, That Hen-bane, Milk-thistle, Hemlock, and such like, whose Juice is known to be hurtful,

may very possibly communicate their Malignity to the Honey, extracted from them; for this Reason, I would make no Difficulty to grub up all such pernicious Weeds in the Places adjacent to my Hives.

68. Now, I think, I have directed you how to bring your Hive safe to the Month of *April*, the Time, when Bees commonly set out in our Country to their Work, and when they begin to increase their Family; for which End they lay their Eggs in Cells, and go abroad to fetch in that Stuff commonly called Bee-Bread; concerning which, its Preparation and Use in feeding young Bees, from their first Formation, until they are able to provide for themselves, you shall be informed before this Treatise is ended, in the Answers to Questions relative to these Matters.

69. When the Weather is inviting, and your Bees are flying out and in, and when they are bringing in Plenty of this Stuff upon their Thighs, then you may conclude, all is well with them; but, if you find them at Work, and yet not bringing in this Stuff, then you may suspect, that they have lost their King some Way or other, and that, therefore, they will turn to no good Account.

70. You'll be more able to judge of this Matter, when you come to have several Hives over Year, and of other Things to be treated of concerning them, by comparing one Hive with another, or your own with those of your Neighbours; however, if your Hive have any Considerable Weight, and your own, or your Neighbour's Bees are fallen to work, and yet, the Bees of the Hive you suspect, bring in Nothing upon their Thighs, 'tis plain, they have lost their King, as I have said.

71. The Reason why I speak of Weight, is, because when an Hive falls short of Provision soon in the Year, and consequently grows light, they'll be going out, but bringing nothing in; so you see, that 'tis by the Weight, that you are to distinguish, whether it be Want of a King, or Want of Provision that ails them: But of this more by and by.

72. In the mean Time, it may be remarked, That an
Hive

Hive well chosen and right managed, seldom wants Provision so soon; for 'tis commonly a Storm in *May*, that kills the Bees for Want of it.

73. About the Beginning of *April*, they only begin to bring forward a new Family, which, against the Beginning of *May*, comes to be very numerous; then the Consumption within is far greater than the Supply from without, the Flowers in our Country yielding little Honey so early; and thus it comes to pass, that the best of them all will run short of Food, if a Storm of any Continuance happens at this Season, when a weaker one with a small Family will suffer less, as I hinted before.

74. It being a nice Point to determine, when Bees want Provision, and what is the properest Method to be observed in giving them Supply, I shall treat of it the more fully, and beg to be excused, if I seem to make Repetitions.

75. Supposing then that a Storm comes in *May*, and continues for some Time, you have Reason to be afraid your Bees suffer Want, and should look to them daily, to see if you can discover any of the following Signs of it.

76. 1st. You should try the Weight of your Hive, if you find it light, you have good Reason to be afraid; for, at this Season, when they have a great Number of young, the Hive will be of a considerable Weight, tho' their Provision be run, but when it falls short, before they begin to breed, the Hive will feel in your Hands, as if there were little in it.

77. 2^d. If the weighing of your Hive does not satisfy you, as truly, I would not have you satisfied with it; then you must lift up the Edge of it pretty high, if you find the Bees make a Noise, and come down to see, what the Matter is, 'tis a good Symptom, if otherwise, bad.

78. 3^d. If you find any great Quantity of young Bees lying on the Board or Stone, either within or without the Entry, or on the Ground before the Hive, 'tis a Sign they suffer Famine; for, at this Time of the Year, whenever they are pinched for Food, they throw out great

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great Numbers of young Bees, especially Drones, some of them perfectly white, being not quite formed, others grey-coloured, and to Appearance perfect, but, as they cannot shift for themselves, they crawl about until they die.

79. 4. If a good Day comes, and your Bees do not fall heartily to Work, you may conclude their Store is gone, yea, tho' they be flying out and in, if they are not taking in Work upon their Thighs, all is not well with them; for as I hinted a little before, they are in this Case just as when a Hive has not a King; but, if you give them a hearty Meal, you'll see them, the very next Day, fall cheerfully to Work, and come home with loaden Thighs. Thus you may plainly discover, whether it is want of Food, or want of a King that ailed them.

80. If you find by these Directions, That your Bees are in Hazard for want of Food, your are immediately to supply them; but, before I proceed to give you Advice concerning this Matter, I shall answer an Objection which naturally falls in here, *viz.* What is the Necessity for letting their Provision be so far run, as to endanger them, when a little Honey, their most natural Food, or even a little Sugar and Water, or sweet Wort, given at a Venture, would not only save their Lives, but also prevent the Trouble of observing daily, whether they are in Want or not. To this I answer, That they are not to be fed at all, unless they are in a famishing State; the Reasons are:

81. 1st. 'Tis exceedingly troublesome to give them Food, in such a Manner, as to prevent their falling out about it, especially if you have more Hives than one; for the neighbouring Bees are very ready to scent it out, which frequently sets all the Hives in the Garden, and, perhaps, in the Neighbourhood too a fighting, which occasions much Mischiefe.

82. 2^d. The giving them Meat, at this Time of the Year, brings them all down from their several Posts, and so by neglecting the Performance of their Duty to the young,

young, they receive a wrong Formation, and great Multitudes of diseased ones will be found crawling on the Ground; tho' you'll discern little, if any Blemish about them, yet they are good for nothing. Now I humbly think, that these Reasons, with what you'll afterwards hear concerning their Wars, may apologize for giving you the Trouble of this Enquiry concerning their having or wanting Food: I next proceed to direct how to feed them.

83. Take a Pewter or Earthen Plate, larger than the Mouth of the Hive, put Honey in it, brought to such a Consistence, by Water mixt with it, as they may lodge it conveniently in their Cells, and that all the candyed Bits may be broken and dissolved. Set the Hive on it, after laying over the Honey, a Sheet of strong Paper pricked full of Holes, that the Bees may eat the Food, just mentioned, without Hazard of drowning, or its sticking to their Legs, then clay it all around, and shut the Entry with Grass or Fogg.

84. Let this be done in the Evening, when they have given over working; and, if possible, in a cloudy, misty Day, when the Bees come least abroad: Remove the Plate next Morning, that their Neighbours may not find the Smell of it. You are also, for the same Reason, to take Care that none of the Honey be spilt upon the Ground, or about the Hive, if it is, 'tis ten to one, but they fight about it; so you see how foolish the ordinary Way of feeding, which exposes them to so great Hazard, is.

85. In case you have not a Plate of the Size aforementioned, cause make a hollow Place in a thick Deal-board, so large as to contain a Plate or Ashet with the Honey, and place it so in the Board, and the Board so under the Hive, that the Brim of the Plate may not hurt the Combs; then shut up the Hive, as before directed. This Deal-board should be as large as the Boards or thin Stones whereon your Hives stand, and may be kept for feeding your Bees from Time to Time.

86. Another Way of feeding, and which I think best in the Spring, when a small Quantity of Food may probably be sufficient, is to turn up the Hive, and to pour the

the Honey prepared, as directed, but somewhat thinner, here and there upon the Combs, so as it may run down amongst the Bees; which Method has this Advantage of the other, That it does not bring them down from their several Stations; and tho' it seems to be a coarse Way of doing, it will answer the Design very well. Possibly a young Beginner will think this an hazardous Undertaking, but there's no Fear, even tho' the Bees be lively.

87. As to the Quantity of Honey, you may take a Pound or so, which I think is sufficient for one Time, tho' some direct a Pound and a Half, or two Pounds: You may intermit the Night following, or, if you think there is no great Danger, you may wait till you see how the Weather turns out; for if 'tis so far in *May*, that the wild Mustard among the Corn is flowered, one good Day's Work upon it will afford eight Days Provision; but if the Scarcity happens before the wild Mustard, one of our earliest flowering Plants of the wild Kind is blossomed, the Bees must be taken Notice of the more carefully, and while you find Occasion for it, you must continue to feed them.

88. I shall next inform you, how to do with an Hive that hath lost its King. I suppose you'll know by this Time, whether 'tis a King or Provision that's wanted. If a King, you must let the Hive be doing, the best Way it can, till your first Hive swarm; then put the young King and his Company upon it, whom they'll receive very chearfully, and these two united Hives will make a very good one before the End of the Season. The Way of putting a young Swarm to any old Hive, you shall be taught afterwards. In the mean Time, I proceed to speak of their Wars, and to direct you how to put an End to them.

89. Bees have a martial and unpeaceable Spirit, and strive to enrich themselves at the Expence and Ruin of their Neighbours; for when no Honey is to be had among the Flowers abroad, they will venture their Lives, and rob for it; then not an Hive within their Reach is left

left unassaulted: I shall first, before I propose Remedies, teach you how to know when they are engaged in Battle.

90. 1. You'll perceive Bees going out and in to the Hive, which is receiving the Injury, early before other Bees are fallen to Work, and at Even when other Bees have left Working; they will also be doing so at the Hive that is committing the Robbery, for these Plunderers find this the best Time for their Purpose, because they meet with the least Resistance.

91. 2. You'll find them meet with Resistance, and the further the Day is advanced, they will be the more resisted, until the Evening come on: You will likewise observe these Robbers hovering in their Flight, about the entry of the injured Hive, as Bees of a new Hive do for some Days about their old Quarters, and then you may see some of the injured Bees running about the Entry, bending up their Wings, and catching at every Bee that lights upon the Board. If they find, upon Examination, that it is a Friend, then 'tis allowed to pass; if an Enemy, 'tis immediately seized, and must either fight or be killed, or fly, if it can get off: You may also perceive the injured Bees, now and then, halting out a Robber, which they have apprehended within Doors, and likewise see some of these Robbers coming out in such a Hurry of Escape, as will often occasion them to tumble down head-long in the Flight: While the Battle continues hot, you will perceive great Numbers of Bees falling down slain on the Ground, before the Hive.

92. So soon as ever you find them engaged, endeavour to put an End to the War in the very Beginning, for 'tis then done more easily than afterwards. For this End, lessen the Entry to the Hive that is getting the Wrong, to such a Degree, that only two, or at most three Bees, can go out and in at once; for doing of which, straiten the Entry, as before directed, for holding out Mice.

93. If, upon the first Appearance of Robbery, you lessen the Entry whenever their Work is over at

Night,

Night, and enlarge it the next Day, when they begin to be throng at Work, that they be not impeded in their Labour by so small a Passage; by doing this, regularly, for several Nights together, further Disorder will be prevented effectually.

94. The Reason is plain. The Nights are yet cold, 'tis the weakest Hives, as I told you, that suffer this Calamity, the Bees therein being the least numerous; and the Cold therefore affecting them most, they go up high among the Combs, sit close together, and preserve Heat, as if it were yet Winter. Thus the Door is left without a Guard, and thus they become a Prey to their Enemies.

95. Now, as the straitning of the Entry makes their Habitation warmer, cherishes them, and brings them down nearer to the Door, so they can the better examine who comes in, and are in the better Condition to make Resistance; for now, that the Passage is so little, a single Bee, or two, can make a more effectual Defence, than twenty or thirty could do before; and hence it is, that the Robbers, meeting with so strong Opposition, give over making further Attempts.

96. But if there hath been a great Slaughter of the weaker Party, before you knew the War was commenced, perhaps this Remedy may prove ineffectual. In that Case, you must either, for some Days, shut up the Hive that is attacked altogether, that the Destroyers coming, from Day to Day, for Spoil, may be wearied by Disappointments, and give over their Design, or carry away the Hive to some other Place, at least to a Mile's Distance; for, if 'tis set within Bounds known to the Robbers, they will renew the Attack; or, if you can do no better, take a desperate Cure for a desperate Disease, and animate your distress'd Bees, as directed by Mr. *Thorley*, to fight like Devils, by disturbing them with a Bunch of stinking Madder, (I suppose any other stinking Plant will do) tied to the End of a little Stick of a convenient Length, till they begin to shew their Resentment. Then you'll see them seize the robbing Bees,

Bees, and tumble them down in great Wrath, so you may assuredly infer their Safety. They will best defend themselves. At the Time you are thus employed, it is needful to give you a Caution to take Care of yourself. But should your Hives thus attacked have but a few Bees, and little Honey, it is better to take them than to stand a Trial.

97. Thus I have led you on Step by Step, and thro' several Difficulties, to the 20th of *May*, when it may be presumed, that the wild Mustard, and some other flowering Plants are blossomed, and so that your Hive is past Hazard of Famine; next, that you may know when your Bees are ready to swarm, or cast, I advise you, now and then, to lift up the Edge of your Hive, and look in; if the Spring has been forward, you'll observe them, their Family being increased, in considerable Numbers below the Combs, by the Beginning of *May*, and if the Weather continues good, they will come more and more in View, and make a buzzing Sound in the Night-time, which will still increase till they cast. But, if a cold Storm comes, they will draw close together, and out of your View among the Combs. They will also desist from making a Noise.

98. As they increase in Numbers, they begin to water, and you will find some Drops of insipid Liquid, upon the Board or Stone before the Entry, which sometimes runs over upon the Ground. This is, no doubt, the Exhalations occasioned by their Warmth, which, being condensed by the external Air, falls in Drops, as I have said; but, when they grow very strong, this Water is not to be found.

99. The Reason is probably this, That when their Heat grows very great, as you'll find it, if you hold your Face or Hand to the Door, it forces these Exhalations a good Way off, before the external Air is so cold as to condense them; so instead of falling on the Board or Stone, as at first, they will now fall upon the Ground, and are there imperceptible; but the most certain Sign, which proclaims that Event to be the very Day, is when

the Bees forbear flying into the Fields, tho' the Season is inviting.

100. Before I go on to advise you, about the swarming or casting of your Bees, I shall here say a Word or two concerning the Entries and Covers of Hives. This you possibly expected ere now. As to the Entry, it must be gradually enlarged, as the Bees grow thronger at Work; you can easily judge what is sufficient, and may manage accordingly with a Bit of Glay, by which, as aforesaid, you may either enlarge or straiten the Entry, as you see Cause. If a Storm comes, you must straiten it, to keep the Bees warm, and if Enemies attack, you are before directed to do it.

101. If you expect that I should advise you, to remove the Winter Cover from off your Hive, that the Sun may have Access to play upon it, you are much disappointed, for it is far better that you keep it on; because, when the Hive grows very throng, and yet not quite ready to cast, the intense Heat of the Sun upon it, when uncovered, so stifles the Bees within it, that they come out, and hang in great Clusters about the Hive, which frequently puts them so out of their Measures, that a Hive, which, to Appearance, was ready to cast, will ly out this Way for several Weeks.

102. When this happens far in the Year, it makes the young Hive of small Value, not having Time to do much in that Season, and sometimes, when bad Weather comes, it will put the Bees from swarming, which is a great Loss.

103. They are very unmanagable, when they take this Conceit of lying out in Clusters, and I know nothing that prevents it so much, as keeping on the Winter Cover all the Year round: an Excess of Cold, and an Excess of Heat, are both prejudicial; it serves to prevent the one in Winter, and the other in Summer.

104. When, by raising the Side of your Hive, you discover it to be quite full of Bees, you should be on your Guard; likewise, when you find the Water dried up, it denotes that they want Room, as I said before,
and

and when they come out and hang in Clusters, that is another Sign of it; any of these prognosticate, that the Time of their swarming draweth near: By this Time also, the Drones will begin to make their Appearance, and your Hive will be making a Reel, as we call it, once every Day, which a young Bee-master is apt to take for swarming, till he be otherwise taught by Experience.

105. This reeling is occasioned, by a great many of the Bees flying, and making a confused Motion and Noise in the Fore-part of the Hive, much after the Manner of Gnats, when they make that Motion we call Midgees dancing: They make this Reeling all the Year round, even in Winter, in a very fine Day, but now they do it every Day; which is the Cause why I have taken Notice of it here.

106. Tho' the Bees should not fly out in Clusters, yet, every Morning when they come abroad to work, a great many of them will stay about the Door, upon the Board or Stone, and perhaps scatter themselves around the Entry of the Hive in a large Circle: This they will probably do for several Days before they swarm; you'll likewise by this Time observe, that when they give over working in the Evening, they double, triple, or quadruple their Guard, which some Time ago consisted, only, of a single Centinel or two standing Centries in the very Passage, or within it, with their Tails outward, and bending up, and their Wings in a continual Motion, making a humming Noise, but now you'll see ten or twelve about the Door, in the same Posture and Motion.

107. When you make these Remarks, you should cause watch them constantly, from before Nine o'Clock till the Height of the Day is more than past, and their Throng is fully over; 'tis likewise convenient to have an Hive provided and in Readiness for the Swarm, concerning which, take the following Directions.

108. If your Bees swarm in *May*, or first Week of *June*, your Hive should be somewhat larger than the old one, especially, if the Swarm is large, Which a young

30 THE PRACTICAL
young Bee-master cannot easily judge; neither can plain enough Directions be given to make it known, tho' Observation and Practice will teach it.

109. If they swarm in the second Week, the new Hive may be just of the Size of the old, but it is better that it should be little, than too big; because, a little one can be enlarged, as Need requires, but one too large makes a cold Habitation for them, all the Winter over, there being empty Room in it; besides, it occasions that they don't swarm early next Year, having the Void to make up in the Spring, before they swarm.

110. I need not direct you to put Sticks in your Hive, for every Body does it; keep an Inch of one of the two lower ones, which cross other directly above the Door without to take hold of, for raising up the Hive the more easily to look how all is within it: 'Tis convenient, that the rest of the cross Sticks should also be so long, that a Part at each End may be on the Out-side; for by this Assistance, one can lift or poise the Hive the more conveniently, and they can be the better pulled when the Combs are to be taken out, especially if they be great at the one End, and gradually small to the other.

111. The middle Stick, that stands perpendicular, should be so long, that the End of it may just reach the Stone or Board, whereon the Hive stands: It should likewise be pretty thick, that when the upper End of it is cut small, for about the Length of an Inch, to go in to the Top of the Hive, the Stick may have a good Shoulder for supporting it, that the Hive may not fall flat in the Top, or yield to a Side with the Pressure of the the weighty Combs full of Honey within, and with the Weight of Turff, or any such Thing on the Out-side, which Hives often do, especially if they are long kept, and which very much incommodes the Bees, occasions the Rain to stand upon the Hives, and so they rot much the sooner.

112. With respect to the Fashion of the Door, take a Piece of Wood, three Quarters of an Inch square, and four Inches long, cut a Door-way in it more than half thro'

thro' the Stick, and leave only a very small Bit at each End, whereupon it is to rest: When this is done, cut out as much of the lowest Roll of the Hive, as receives the Piece of Wood, which fix there with a Needle and Pack-thread.

113. This Sort of Gate, which I partly directed before, and which extends in Breadth, is certainly better than that which hath the Extention of it to the Height; for, when the loaden weary Bees pitch upon the Board before it, and run forward to go in, if they fall not directly opposite to the Door, they are apter to go wrong than right, and after going a good Way round the Hive, in Search of the Entry, must return, which is a Fatigue and hinders them in their Work; whereas, when it is thus broad, they will rarely miss it.

114. When your Hive is thus prepared, and after the loose Straws, or any Thing else that will come off by cutting, or rubbing, are taken away, to save these cleanly Creatures a great Deal of Labour, dress the Top of it within with Honey, or with a small Handful of Fennel, dipt in Ale, sweeten'd with Sugar; this done, keep it at Hand, and have likewise some Vessels of Water by you, with a Bundle of Straw, or long Grass, lying in each of them: But I return.

15. You'll see Numbers of Bees flying round the Gate, in the reeling Way described, and observe their Increase and Noise grow greater: Those about the Entry will begin to make greater Stir; you'll also see them thronging in great Haste out of it, and thus they will continue to do, till they are all come off.

16. In the mean Time, while you are satisfying your Curiosity about their Way of swarming, you must have a Servant or two employed to go round them, to see if they are beginning to hive upon any Place, or, if they are going out of your Garden: If you, or your Servants, find them breaking of at any Side, Water must be thrown against them, to beat them back; Thus you are to endeavour to keep them within the Garden, till they pitch upon some Place whereon to hive, which you will

will soon discern by their gathering together to it. The Author of the *French* Natural History and Mr. *Thorley* agree, that Noise made with Kettles, Pans, or any musical Instrument, is a needless Ceremony.

117. If there happens to be a good Breeze of Wind, when they are swarming, 'tis a great Advantage, for this keeps them low under Shelter, and determines them to chuse a Place much the sooner; but, if 'tis a calm sultry Day, they fly much higher, and cannot so easily be kept from going away; I shall therefore speak the more fully on this Head.

118. 'Tis very ordinary for them before they swarm, to search in all the Neighbourhood, for a fit Place to take up their Quarters in: If there is a great House, a Church, or a Steeple, near, 'tis ten to one, but your Swarm may essay to go there, and take up their Abode, in some Chink of a Wall, or Ceiling of a Room, or the like, if their so doing be not hindred; and, if an empty Hive with Combs in it is allowed to stand in a Garden, it will rarely miss of being provided with a Swarm, for in their Search for a House to come to, when they leave their old Habitation, they will find this a well furnished one, and repair to it; but as this Practice might have a bad Tendency, there is a Law against it.

119. The Way to know, if they are to take Quarters of their own chusing, is, by observing those Places you suspect, if you find Bees flying about them, or, especially, if they are going out and in at any Hole, or Chink, as if a Hive was there, then your Suspicion is just; for they will go some Days before they swarm, to an old Hive, or a void Place of an House, carry out all the Dust and Nastiness, and so prepare for the Family's Accommodation.

120. The Lady of a great House having asked a Friend of mine, if any of his Bees were swarm'd, he answered no; there is a Swarm then, replied she, of some other Bodies, hived in the Top of my Closet-Chimney; so she carried him to her Closet, shewed him some Bees that had fallen down, and desired him to listen to the

Noise

Noise in the Chimney, which, when he did, he told her, there was no Swarm there as yet, but that there were some Bees comic there, to provide Quarters for one, which would, no doubt, follow, if they were not hindered.

121. Therefore he advised her to burn now and then a little Brimstone in the Chimney, which disoblged them; but the next Day, or the Day following, a Swarm took up their Habitation in the Ceiling of the House, near that very Chimney Top.

122. They are apt to play such Tricks, when there happens to be a Tract of fine calm Weather, at the Time of their swarming. For the Goodness of the Weather allows them to roam to all Places they have a Mind, tho' they be high; whereas, when the Days are not so good, they have not so much Time to spend in these Affairs, neither do they fly to such high Places, especially if the Wind is high.

123. Another Way to know, if they are for a Habitation of their own chusing, is this: They'll either, in the Time of Swarming, essay to break out of your Garden, which you are to endeavour to prevent, by throwing Water among them, on that Side, where they are making the Breach, as aforementioned, which often proves effectual, but not always; or, after they are hived upon a Place, they will rise again, and take their Way immediately, yea, sometimes they go up into the Hive you put over them, and stay a while, and yet, will come down again, and fly away.

124. The Way to prevent which, is, in the first Place, to lay the Hive over them very soon; if they begin to go up in it, it is a good Sign, tho' not an infallible one, as you have just now heard.

125. Next, you are to continue a watchful Eye over them, especially if they go not up into the Hive; for this is an ill Token; as long as they ly quiet, there is no Fear of them; but, if they begin to run over other, and make a Noise, and a continued Motion with their Wings, you may then be sure, they are not to stay.

126. In this Case, whenever you perceive them making

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ing this confused Motion and Noise, you are to throw a good Deal of Water among them, with a Bundle of Grass or Straw, which will humble them for a while; if after they dry, they begin to their Confusion anew, you must water them again, and so repeat this Remedy, till the Evening come on, which will readily determine them to go up into the Hive; if they do, they seldom go away, after they have been a Night in their new Habitation, unless the King has gone back to the old Hive, before you began to water them: In that Case, 'tis in vain to imagine they'll stay, even tho' you have kept them a Night.

127. That very Summer, when, as I told you, the Bees were seeking Lodging in the Top of the Lady's Chimney, the Weather was extraordinary soft and warm, which occasioned a great many Hives to fly away; in the Struggle I made to keep mine; there was one Swarm, particularly, that settled upon the Trunk of an Apple-tree, which made it very difficult to get a Hive to cover it, so as to encourage them to go up; mean while, they began to act the Part I just now described, which obliged me to water them from Time to Time, until the Evening: This I thought would have effectually put them up, but, to my Surprize, I found them in the Morning where I left them at Night, which set me a-thinking what I was to do with them next.

128. I recollected that I had an Hive in my House, with empty Combs in it, which I concluded would assist me to overcome the Difficulty, and so it happened; I set it over them in the Place of the other, and, in less than a Quarter of an Hour, they went all up into it, and the Hive became a very thriving one.

129. I therefore advise you, if you have any plundered Hive, to keep it carefully for this Purpose; yea, if you have any late Swarm that has little Honey in it, I advise you to kill the Bees, and to preserve the Hive with the Honey in it from Mice and other Accidents, that you may have it in Readiness to serve you in a Pinch of this Kind; or, tho' you should not have Use for

For in this way, yet it may serve another late Hive, and make it either the fitter for keeping, or killing: Upon these Considerations tis an Advantage to have some such Hives by you, tho' there be an *English* Quart of Honey in each of them.

130. I come now to direct you how to manage, when your Swarm begins to gather together in one Place; if it hath been long ere the Bees took a Settlement, and especially if they have been essaying to break away, or, having begun to fix upon one Place, have left it again, and chosen another, then, whenever you see a considerable Number of them together, I shall suppose the Bigness of your Fift or so, throw Water on them, which will prevent their rising; immediately the easier lay your Hive over them, tho' the Bulk of them be still flying round about you; only take Care you kill as few as possible with your Feet: If they like their new House, they'll soon go up into it, and when they are up, they will fall to Work, unless upon Trial they alter their Opinion, and resolve to leave it.

131. It is ordinary whenever the Hive is laid over them, to cover it with a white Linnen-cloth; but this is not material, tis only necessary that something or other be laid over it, to make a Shade; an Armful of Grass or Weeds, of no bad Smell, is as good as any Thing to hinder the Sun from beating with Violence upon the naked Hive, which is apt to make the Bees startle, and dispose them to leave their Quarters.

132. I might have told you, before I advised you to lay the Hive over them, to consider the Place where the Swarm settled; if upon any Thing that can be easily brought to the Ground, such as the Branch of a Tree, a Shrub, or the like, it should be done, and the Hive set upon it instantly; But if the Hive goes so very close to the Ground, that the Grass and Weeds shut it up on all Sides, you must raise up the Edge of it with a Stone, or any Thing convenient, that the Bees may have free Access out and in.

133. If they settle upon the big Branch of a Tree,

or the Side of an House, or upon any Thing that cannot be brought to the Ground, then take the Hive to them, and put it over them the best Way you can: But because, when they pitch upon the Branch of a Tree, and an Hive is set over them, 'tis so much exposed, and in View, that it seems to be no secure Habitation for them, they therefore do not like to go up into it: In this Case you should take a coarse Sheet or Table-cloth, wrap it round the Hive and them, and bring both as handsomely down as you can, and so as to shut the Hive quite up, except a direct Passage for the Bees to go out and in, this will make them like the Hive the better, and go up into it much the sooner. Mr. *Therley* advises, if they settle on the Body or large Arm of a Tree, &c. to sweep them into the Hive with a Brush, or a little Handful of small Branches. This is best done when the Sun is set, and the Bees are, by the Cool of the Evening, become less animated and furious, says the *Natural Historian* aforementioned.

134. When your Bees settle in different Places, as they frequently do, if you allow them a little Time, you will find those who want their King, rise gradually and join those who have one; but 'tis best not to allow them this Time, lest they go back to the old Hive, and so make the new one inconsiderable; or, lest those who have the King fly away; you are therefore to consider, what Cluster can be most easily transported to the other, lift that, join them, and set your Hive over them, while both of them are lying on the Ground, if possibly you can.

135. It often happens, when Bees are casting, that the Swarm goes back to the old Hive, where they will stay all Night, and if the next Day is good, will cast again: This they will do, either before, or after they begin to gather in a Cluster, or sometimes, even after they are gone up into the new Hive: In the first of these Cases, you will sometimes observe, when they are hiving, that they will not be quite come off, and yet that those that are, will be going home again, making a

Cross-

Cross-ride at the Passage: Sometimes they will come quite off, fly about a little, and turn in again; this you cannot prevent.

136. If they gather in a Cluster, and thereafter go back, you must wait a Day or two longer for them; but if they do this every Day, as sometimes they do for eight or ten Days together, and are very vexatious; then you must either ply them with Water, as directed in the Case of their flying away: Or whenever you find them quite come off the Hive, and beginning to gather in a Cluster, you might cause lift the old Hive speedily, and carry it to a Mile's Distance at the least, which will cause them stay; but if the young Hive does not settle according to your Expectation, the young King not being fully ripe and come off, you must certainly bring back the old Hive next Morning.

137. If they have been in Use to go up into the new Hive, and yet to go home again, in this Event you must use the Remedies proposed in the former Case, or carry away the new Hive whenever the Bees go up into it.

138. I shall mention another Case: A great Part of the Swarm goes back in Time of Hiving, those that stay behind gather into a Cluster, go up into the new Hive, and fall a working; but, not being proportioned to the Hive, it cannot be supposed, that they can turn to any good Account. In this Case, you must either put them back at Night to the old Hive, and wait their Casting again next Day, or you must keep them to join another Swarm; both which you shall be taught to do.

139. When your Bees are going up into their new House, begin to work, and have all good Appearance; you must let them continue in that Condition all Night; next Day lift your Hive, and set it in the most convenient Place, which is certainly where the Bees were hived, if it is on the Ground, and there be nothing to hinder it to stand there; for if you remove it, you'll see for the next two Days, a great many of the Bees spending

spending their Time to no Purpose, flying about the Place where they were hived.

140. Wherever you set them, you must have something provided for the Hive to stand on, such as wooden Stakes driven into the Ground, till they are only ten or twelve Inches above it; on this set your Deal-board or thin Stone, and when you have it right adjusted, that is, not perfectly level, but declining a little forward, then set on your Hive with the Entry of it to the South, take equal Parts of Clay and Horse-dung well wrought together, and put a little of this all round the Hive, which will both fix it to the Board or Stone, and keep Rain and Vermin from getting into it; You must also cover it with something for keeping out the scorching Heat of the Sun, which might so far at least, melt the Combs, as to disengage them from the Hive, and make them fall down: The ordinary Thing used for this Purpose is thin Turf, called Divots, which should be made so long as to come near to the Door, to overshadow the Hive the more.

141. The Reason why the Hive should decline a little forward is, That when the strong southerly Wind blows the Rain into the Entry, it may run out again; as also, that the Bees may the more easily manage any Thing they have to take out, such as dead Bees, or Clods of Nastiness that has gathered in the Winter-time, and all other Rubbish whatsoever; for when the Board declines to the Door, it gives them the Advantage of having their Burden to draw downwards; so they perform their Task the sooner, and the less Step is put to their necessary Work of gathering Honey; wherefore take this general Advice to contrive all Things about them so as to give them as little Hindrance in their main Work as possible, for much depends upon a Summer's Day or two with them; and for this very Reason you ought to keep the Stone or Board, and every Thing within or about the Hive, as clean as you can, to prevent their Trouble and your own Loss, especially

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D. E. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

about the End of *March*, when every Hive should be lifted up, and the Board cleaned.

142. If you want to be informed, whether a Deal-board or a Stone, is properest for setting your Hive on, I answer, That, so far as ever I could discover, the Difference is very inconsiderable; the Stone is not so liable to have Rifts and Chinks in it, thro' which the cold Wind may get up to the Bees, and, in that Respect, is better than the Board; but 'tis alledged the Stone is too hot in Summer, when the Sun beats violently on it, and is therefore offensive to them when they go out and in; as also, that it is cold and damp for them in Winter: These may be Inconveniencies, tho' I could never be sensible of them.

143. The Deal-board has this Advantage, that it makes easier Work to transport them with it, than with a Stone; and you can guess pretty well the Weight of your Hive, by lifting the Board along with it, when you have a Mind to poise it in your Hands; whereas, when it stands upon a Stone, levery Time you lift it, you must pull it therefrom.

144. If you chuse the Deal-board, cause it to be made of well-season'd Wood, light and well joined; but if the Stone be your Choice, you may batter on some Folds of Grey-paper, upon the Part before the Door, to moderate the Heat in warm Weather.

145. That Part of the Stone or Board before the Entry should be four or five Inches broad, for when it is too narrow, the Bees who are weary with a long Flight, and come Home laden, are not able to guide themselves so exactly, especially if the Wind blows strong, as not to miss the Board frequently, so they fall upon the Ground, and must take Wing again ere they get in, which they are not able to do, till they rest. This makes a Hindrance in their Work, which should be prevented, and to avoid this Inconvenience, I have sometimes taken a Piece of Deal-board, of a convenient Length, to make an easy Slope, and have made it rest betwixt the Ground and the Fore-part of the Board or Stone whereon the Hive stands

stands; that the Bees might fall upon it, when they miss the proper Place left before the Door, and climb up easily without flying.

146. In or about ten, twelve, or fourteen Days, you may expect a second Swarm; you are not to look for it in the Season, if the Time exceeds Seventeen or Eighteen, tho' the first Swarm went off soon; but you are not to expect such a Solemnity at this, as at the former Swarming; for they do not ly out in Clusters, nor spread themselves about the Entry, but come off without any Ceremony, and yet says a curious Observer, you have a much surer Prognostick, than you had the first Time; for if you listen, especially when they have done working, you will hear one of them making now and then a very distinguishable Sound from the rest, which he begins to do about Forty eight Hours before Swarming, with this Difference, that the first Twenty four Hours the Sound is much weaker, and the Intervals betwixt the Sounds are greater than in the other Day (for he is sounding both Day and Night) when the Noise is louder, and much more frequent; for it will be five or six Minutes betwixt the Sounds the first Day, or perhaps more, whereas there will be but a Minute or two betwixt them the second.

147. This Sound, commonly called *Peeping*, proceeds, I suppose, from the young King, giving Signal to his Company to make ready for a March: You'll hear it performed on different Keys, and coming from different Corners of the Hive from different Kings: I cannot pretend, says he, to describe this Sound fully to your Understanding; it pronounces, as it were, *Peep, peep, peep*, a Dozen or twenty Times successively with one Breath, then stops, calls that same Way again, and so on, somewhat like a Hen-chicken peeping for its Dame, when it hath lost her.

148. I do indeed believe, that this Noise is made by the King, and that there are as many young Kings in the Hive, as there are different Sounds uttered; but why this Noise is made before the Casting of a second

or

or third Swarm, and not before the first, I know not; neither can I account for so many Kings being in a second Swarm; and so far as ever I could discover, only one in a first.

149. I one Day, says he, made a Discovery, which confirmed me in my Opinion concerning the Sounding of the Kings: I had an Hive which swarmed a second Time, and, because it was late in the Year, I inclined to put it home to the old Hive, which I did, by turning up the Mouth of the new Hive, and setting the Top of it upon the Ground, with the Edge of it touching the Board of the old Hive, that so they might crawl up, and go home to their former Habitation: They were slow in their Progress, to a Friend, who was with me, proposed that we should try to catch the King, which we concluded would quicken their Motion: Accordingly we set to Work, each of us with a Twig in our Hand, and when we turned over the Bees, came in View of the King, and tried to catch him; he, whenever he felt the Touch, made the same Noise we heard before Swarming, and endeavoured to escape, but was caught at last.

150. I shall here narrate an Observation, which was communicate to me by two Friends curious in Inquiries of this Kind, which proves that there are several Kings in a second Swarm.

151. As they were one Day in their Garden, an Hive happened to cast a second Swarm, which settled on a Goose-berry Bush, but when they came to view the old Hive, they found it in great Disorder; and discovered a distressed King lying on the Ground before it, which determined them to put back the new Hive, to preferre the old one, by furnishing it with a King; but the Bees of the old Hive took Care to provide themselves by detaching a good many of their Number, to bring back a King from the new Swarm, which they did, and which Detachment having brought away too many Attendants along with the King, my Friends found that the remaining Part was not worth keeping, and so they put back the

the said Remainder at Night. Next Morning when they went to see the Hives they had put together, they discovered other three Kings, all lying dead at the Entry.

152. I had almost forgot to relate a material Circumstance of the Story, which was, That immediately upon finding the disabled King, my Friends put him upon the Board at the Entry to the Hive, to try if it would quiet the Disorder, which indeed it did, for the Bees shewed a great Fondness of him; but my Friends thinking it unsafe for them to have such an Invalide of a King, determined, as I told you, to put back the Hive, so to provide them with a young vigorous one; but, as you heard, they supplied themselves, and so were quiet; upon which my Friends had the Curiosity to try them again with the disabled King, but as they shewed him no Respect, so neither did they offer him any Insolence, but treated him with Neglect, which was not the Case when they took him to another Hive, for there he was attacked with great Fury.

153. When you find the Sounding in your Hive loud and frequent, you'll next Day have a second Swarm, which you are to manage in the same Way as you did the first; if it is soon in the Year, and if your old Hive is strong, you may have a third in three or four Days, which will give you the same Advancement as the former did; but after six Days you are not to expect the third.

174. A third Swarm is so insignificant, that 'tis best to put it back, especially if your two former were large, or if it is late in the Year; but if you think the old Hive can well enough bear the Want of it, then you may either put it to the second Swarm; or if you have incautiously put your first or Top-Swarm in too big an Hive, then you may put your third to it, in any of these Cases it will turn to good Account, when it could never have done by itself.

155. The Design of joining two Hives together, is either, as you just now heard, to make them turn to good Account in one, which by themselves would prove

of

of little Value, or to enlarge your Hives, which perhaps are of too small a Size. Or, 3^{dly}. to afford a King to an Hive that has lost one. A large Hive will yield a great Deal of more Honey than a small one, and yet require no more Charges or Attendance, unless it be a Trifle more for the Price of the Hive.

156. I make this Supposition, that you have two Top-Swarms hived in one Day, which you incline to join together; and because you could not know which of them would be largest, you have therefore a large Hive provided for each of them. When you have got them both housed, you must consider which is the largest; because the smallest must be put into the Hive which contains the biggest; this is a good Way to prevent their fighting; for when a large Swarm is put into an Hive upon a small one, being conscious of their own Strength, they resolve to make good their Quarters, while the lesser one in Possession, will not yield until superior Force prevail, thus they commonly fight.

157. Wherefore, when the Evening comes, take the Hive with the smallest Swarm, turn up the Mouth of it, set it firm in the Middle of the four Stakes which you had driven into the Ground, for the Hive to stand on, set the Mouth of the other Hive upon it immediately, and so fix them, with a Cloth about them, to stand all Night, that the Bees may go up with their Conveniency. Next Morning you'll find a dead King lying in the empty Hive; but because, even in this Case, they will sometimes fight, tho' very rarely, therefore 'tis a better Way to spread a Cloth upon the Ground, to take, betwixt your Hands, the Hive, wherein the Swarm is that you would join to the other, to give it a Stroke upon the Cloth to make all the Bees fall out of it, to set the other Swarm over it immediately, and to leave them to go up. If any Bees remain in the other Hive, lay it down with the Edge of it to the Entry of the full Hive, that they may go in with the rest. This puts them in great Confusion, and puts fighting out of their Mind.

C

158. But

158. But a better Way yet, if both Swarms come off about the same Time, is to join them together as you was directed, in the Case of a Swarm divided, and hived before the other Hive swarmed; then, when it is hived, carry it to the first, and put it below the Hive, if it can be done; if it cannot, take any of the Ways with it aforesaid.

159 These are the Ways of putting Hives together, which may be very well done, tho' they are not swarmed at one Time, for a young Hive may be put to any other Hive, whether it be of the same Season or not, by the methods just now directed.

160. There is another Way of joining Swarms; it is this. So soon as the Swarm is hived, which you propose to put upon an older Hive, whether of the same Season or not, take the old Hive, as if it were an empty one, and set over the young one. This I have not experienced, but believe 'tis the best Way, because both Hives being thereby put in Confusion, they will be the less apt to fight, and they are less disobliged at an Injury in the throng Time of their Work, than when they have left it off, or before they begun it, and have their Guards set. As for these Bees that are abroad when you lift their House, they will either fly about the Place where the Hive stood, till the new Swarm be gone up, when you may bring the Hive again to its Place, or they'll find out the Place where it was carried to, and go to it, or else they'll go to some other Hive, which is no great Inconveniency; but if the young Swarm has gone a great Way off, or to some high Place, which makes it inconvenient to carry the old Hive to it, then you must take some of the other Methods.

161. There is not such a Nicety to be observed in putting back an Hive to the Hive it came from, as there is in joining two other Swarms together, for there is no more to be done in the first Case, but to shake them out of their new Habitation upon a Cloth, which has a Selvadge of it, fixed along the Edge of the Board, on which the old Hive stands, that they may thereon crawl up

up and go home ; or, to turn up the Mouth of the new Hive, and cause the Edge of it touch the Board of the other, and so let them go up that Way ; or, if you please, let them hang upon the Twig or Branch on which they settled without an Hive over them, and then convey them at Night, and shake them off about the Door of the other Hive. But this Way is not so good, for when they are allowed to hang in a Cluster, they are apt to go away, unless you water them now and then.

162. If your Hive shall be long in casting, either by Reason of the Bees having been pinched for Food in the Spring, or by Reason of their lying out in Clusters, then the best Way is to enlarge it, and so hinder them to swarm that Season, for the young Hive would turn to small Account, having short Time to work ; but the Bees thus kept together will make the old Hive a good one.

163. If they do not swarm before the End of *June*, you had best take this Way, unless they have been kept back with bad Weather, and you live among Muir and Meadows. In this Case, if they go off in the first Week of *July*, they may do well, for the Swarm will be large, and the late Flowers will provide them plentifully.

164. When they ly out in Clusters, some sweep them down with Nettles, or other Things. I never found the Advantage of this, tho' I do not dissuade from it. The most effectual Remedy that I know of is keeping the Winter-covers upon Hives, as I formerly mentioned, and keeping strong Hives over Year, that they may be soon ready ; for a Swarm seldom lies out in Clusters in the Beginning of the Season, because, being ready against the first hot Weather, they then make way ; but when the Weather grows so very warm, that they are not able to stay within, and yet are not ready to swarm, then they ly out.

165. If your Top-Swarm has got good Weather, and is full with Combs, and throng with Bees, and there is yet a great Deal of the Season to come, then you should enlarge

enlarge it, to prevent Swarming, which should not be suffered. If the Season is advanced to the Middle of *August*, or farther, and yet you are afraid that your Hive swarm, then you should take five or six Bits of Wood, Inch thick, or a little larger, put them under the Hive, at equal Distances, and put Clay all around to fill up the Vacuities, which will give them more Air, and when working Time is over, these may be removed; but if the Hive is full by the End of *June*, or Beginning of *July*, you may enlarge it three or four Inches thick, concerning the Removal of this larger Eek, you shall be advised when I come to speak in general of the removing of Eeks.

166. Some chuse Eeks of one Kind, some of another. Straw made like the three or four lowest Rows of an Hive does pretty well when well wrought, or a Wooden Machine made by a Couper, of the Dimension of the Mouth or Bottom of the Hive. Others take a Sieve or Riddle Rim, bend it till it comes to the exact Diameter of the Hive, and then fix it; but, because 'tis difficult to make an Hive stand upon it, a better Way is to put two Rims together, one within another, which makes a broader Foundation for the Hive to stand on, but the best I know is made thus: Take a Piece of Deal-board, of an Inch Thickness, sufficient Length, and what Deepness you please; then take a Hand-saw, and at every half Inch Distance saw it almost thro', which will make it bend into a Circle of what Dimension you think fit, if your Eek is deep, there is no Fault in putting Cross-sticks into it, the better to fix the Combs.

167. When you have made your Eek ready, and have cut the Door-way in it, you must have an Assistant; one of you must lift the Hive, and the other put the Eek under it. The best Time for this Operation is, when the Bees are throng at Work, then, the Hive being emptiest, the fewer will be killed, and you will be in the less Danger of being hurt, for they are not then so injurious as when they are idle, and have their Guards set.

168. If you have given your Hive a large Eek, and the Weather proves to be so very bad, that they get it not near filled, then 'tis best to take it away, because it would make them cold in Winter, and delays their swarming in the next Summer. The Way to do this, is, (after removing the Clay applied to fill up void Places, and make the Hive stand the firmer) to endeavour to get a Wier or strong Pack-thread betwixt the Hive and the Eek; with either of these you may cut off the Combs, and carry off the Eek; but support the Hive with Bits of Wood, half an Inch high, that the Combs left may be thereby kept from the Board or Stone.

169. I spoke in general of the killing of Drones; here I shall be more particular: Don't begin to kill them, till the Top-Swarm be gone off, lest that protract the Flight of it; but immediately thereafter put a Crape or thin Cloth over your Hat, to keep it at a Distance from your Face, and yourself otherwise in Armour, the best Way you can; dressed for the Purpose, sit down by the Side of an Hive, about Eleven o' Clock, the most ordinary Time of their coming out, and with a good sharp Table-knife, you may kill at one Down sitting more of them than would fill a Scots Chopin Stoup; this you may repeat for several Days successively, from whence you may judge, whether it be an easy Matter for an Hive to maintain so many idle Destroyers, who, as far as I could ever discover, are good for nothing. Is it not plain, that an Hive that has cast two or three Times liberally, must be in Hazard of being destroyed by these Gluttons, tho' in a strong Hive their Maintainance is less perceptible?

170. When these idle Spend-thrifts are allowed to live till the End of July, or so, when the Working-bees give over hatching, fall seriously to the gathering of Honey, and then kill them of their own Accord, these Inconveniencies follow, 1st. They are all the while wasting and destroying the Honey. 2^{dly}. The Working-bees spend their Time killing them; you'll frequently

see

see them haling them out, and stinging some of them to Death; but as to take this Way with them all, would be a hard and tedious Task, considering the vast Numbers of them in an Hive; they therefore take another Method. The Bees go up among the Combs, and defend the Honey till they starve the Drones, which for a Time divests them from gathering Honey; but an Hive, weak of Working-bees, is often of themselves scarce able to overcome them; that this is the most common Way the Working-bees take of killing the Drones, will appear evident, if you make these following Observations.

171. 1st. You'll find when an Hive is thus employed, it will be making very small Progress in working, for few Bees remain for it, when so many are employed as aforesaid; and one not experienced will be surpris'd to find this Hive doing so little, when others in the same Garden are so busy. The Reason whereof is, that they either have not so much of this killing Work to do, or have more Bees to perform it.

172. 2^d. If you look into Galls-hives, you'll observe the uppermost of the Boxes full of Drones, with few, if any Working-bees among them during all the Month of *June*, and the Beginning of *July*; but when the Time of Killing comes on, you'll see their Stations quite changed, the Drones all in the lowest, and the Working-bees in the highest.

173. 3^d. If you lift up the Edge of a common Hive in the Month of *June*, or in the Beginning of *July*, you'll see only Working-bees, but if you raise it in the Killing-time aforesaid, you'll see the Drones lying on the Board or Stone with their Faces downward.

174. 4th. When you kill them in *June*, you'll find the Knife cut them easily, and that they are so full of Honey, that the Working-bees throng about them, and suck it out of them, but when you kill them at the Time when the Bees themselves kill them, they are dry and withered, and have no Honey in them. Nay, I'm of Opinion, that the Working-bees kill the Drones with
greater

greater Ease than one would imagine, being perswaded, that when they grip them by the Leg, or Root of the Wing, as you see is their Custom, they have a Way of communicating Poison to them, which proves deadly, in the same Way that Spiders do to Flies.

175. From what is said, 'tis plain, That if you have not killed your Drones until the Working-bees begin to do it; the best Way is to lift up the Edge of the Hive at Night, to sweep out these Drones with any Thing convenient, to put down the Hive again, and to shut the Entry of it immediately, killing them as they seek to get in, which makes short Work.

176. If you live in a Soil of Ground, dry and early, when the Flowers are gone, which will probably happen in the End of *July*, or Beginning of *August*, carry your Hives, especially the weak ones, to a muirish Place, at least a Mile's Distance, that the Bees may feed on the Flowers of the Heath, and late Meadows or Hain'd, *that is*, kept Grass; and, when they have given over Work, bring them home again; or, if you live in a muirish Place, carry them in the Spring to a dry and early Soil, and bring them back when the Flowers are gone.

177. The *Natural History*, I have mentioned, takes Notice, that it was the Practice in *Egypt*, *Greece*, *Italy*; the Country of *Juliers*, and that it is the Custom of *France*, even at this very Time, to travel with Bees far and near, by Land and by Water. The Accounts are curious.

178. Here, one reading the Manuscript, made a Remark, which I must allow to be just: You have raised your Readers Curiosity, said he, but taken no Pains to gratify it; and besides the Story, (for I have read it) is not only entertaining, but may be useful; borrow it, continued he, for he has it from others, and whosoever writes next upon the Subject, will possibly take some Thing from you. My Objection was, that the Account was long, and that I could not abridge it, without losing some Part of the Meaning of the Author, and the Beauty

ty of his Expressions: Then take it all, replied he; you'll find it the best Way: So hoping you'll be of this his Opinion, you have the Story as follows.

179. *Eugen.* "Spite of the Ignorance and Rusticity which have got Possession of *Egypt*, there remain in it several Foot-steps of the Industry and Skill of the ancient *Egyptians*. One of their most admirable Contrivances is, their sending annually, the Bees into distant Countries, in order to get Sustenance, at a Time when they could not find any at home, and afterwards to bring them back, as the Shepherds should travel with their Sheep, and make them feed as they went along. The Inhabitants of lower *Egypt* observed anciently, that all the Fruits of the Earth ripened sooner in upper *Egypt*, than in their Parts, which made a Difference of above six Weeks, between the two Countries. Hence they were prompted to make their Bees, if possible, reap an Advantage from this Interval; or, in other Words, to procure them Food six Weeks sooner, than they would have done in their native Place. The Expedient made use of by them, for the Purpose we are speaking of, is employed in this Age. About the End of *October*, all such Inhabitants of Lower *Egypt* as possess Hives, embark them on the *Nile*, and convey them upon that River, quite to upper *Egypt*, they observing to arrive thither at the Time when, the Inundation withdrawing, the Lands have been sowed, and the Flowers begun to bud." *The Hives having come to this Part of Egypt, are there placed pyramidically in Boats prepared for that Purpose, after being marked and numbered by the several Owners who set them there. In this Place the Bees feed in the Field during some Days. Afterwards when 'tis to be supposed they have got in all the Honey and Wax that could be met with within two or three Leagues round, their Conductors convey them in the same Boats, two or three Leagues lower, and there leave the laborious Insects so long Time, as is necessary for them to collect all the Riches on the Spot in question.*

" Thus the nearer they come to the Place of their Abode,

" the

“ the Earth forwards, its Productions, and the Places
 “ flourish in Proportion; so that we may then say of
 “ the Bees, with something more Truth than we ob-
 “ serve with regard to the Ladies; that Flowers sprung
 “ up under their Feet.” In fine, about the Beginning of
 February, after having travelled thro’ the whole Length
 of Egypt (gathering all the rich Produce of these delight-
 ful Banks of the Nile) they arrive at the Mouth of that
 River towards the Ocean; whence they set out and return
 to their respective Habitations. For Care is taken, to set
 down exactly, in a Roll or Register, every District from
 whence the Hives set out in the Beginning of the Season;
 their Numbers, and the Names of the particular Persons
 who sent them; as likewise the Mark or Number of the
 Boats, in which they were placed, according to their se-
 veral Habitations*.

179. Clar. “ It must be a singular Spectacle to a
 “ Traveller, to view whole Fleets of Bees, sailing pom-
 “ pously on this noble River. Cleopatra’s Fleet which
 “ went to meet Mark Anthony was more gaudy indeed,
 “ but then it did not reflect so much Honour on the
 “ Understanding of the Egyptians. But I have heard
 “ of something still more ingenious, with regard to our
 “ Insects; if we may credit what we are told in *Spectacle*
 “ *de la Nature* †. ’Tis there declared, that the *Egyptians*
 “ had found the Secret of giving an Education to
 “ Bees, such as few Animals are capable of acquiring:
 “ That they had Shepherds, who led them to Pasture,
 “ in the same Manner as a Shepherd leads his Flock;
 “ that the Bees more tractable than the last mentioned
 “ Animals were prompted merely by a Whistle, to
 “ leave their Hives, or return to them; to go from one
 “ Meadow to another; to fly to the Banks of a Rivu-
 “ let; in short to follow their Leader, from Village to
 “ Village, whither soever he might think proper.”

H

180. Eugen.

* Description of Egypt, Tom. XI. Page 24.

† Tom. III. Page 37. in our English Translation of
 this excellent Work: viz. Tom. III. Page 23. of the 8^{ve}.
 Edition.

180. *Eugen.* " I also have heard this Relation, of the
 " other little Romance ; and I remember that the Author
 " quotes, to justify his Assertion, a Passage from the
 " Prophet *Isaiab* *, and another from St. *Cyri*l. How-
 " ever, notwithstanding these venerable Authorities, I
 " believe we may doubt the Truth of this Assertion ;
 " and apply this Whistle to Sailors concerning the Ma-
 " nagement of Boats ; I mean, that it was used about
 " sailing ; and other Ways to direct the *Egyptian* Mari-
 " ners, rather than govern the Bees.

181. *Clar.* " But, *Eugenio*, if *Isaiab* declares the
 " very Words mentioned in *Spectacle de la Nature*,
 " methinks we cannot but give Credit to them. Do
 " you consider that 'tis a sacred Writer who speaks ?

182. *Eugen.* " I bear no less Reverence to this divine
 " Book than St. *Jerom* did ; and will observe to you
 " (after him) that many Things are told in Scripture,
 " conformably to the Opinion which prevailed in that
 " Age ; and not to the most exact Truth †. The sa-
 " cred Writers express themselves sometimes suitable
 " to the Notions of the Vulgar, rather than agreeably
 " to the Accuracy of Physicks ; and for this Reason,
 " because human Sciences are of little Consequence
 " with regard to the Knowledge of Justification and
 " Sanctification ; which is the only End proposed by
 " the Almighty in giving us the Scriptures. Bees, in
 " our Age, would not be capable of receiving such an
 " Education ; and 'tis more than probable, that those
 " of past Times were not better qualified to learn, than
 " our present Insects. But to resume our Subject. *E-*
 " *gypt* is not the only Country in which our Insects are
 " made-to-travel. *Alexander de Montfort* tells us that
 " the *Italians*, who live near the Banks of the *Po*, treat
 " the Bees in much the same Manner as the *Egyptians* ;
 " that they load Boats with Hives, and convey them
 " to

* See *Isaiab* v. 26. and vii. 18.

† *Juxta opinionem Illius temporis, & non Juxta quod
 rei veritas continebat.* S. Hieron in L. 28.

“ to the Neighbourhood of the Mountains of *Piedmont* ;
 “ that, in Proportion as the Bees gather in their Har-
 “ vest, the Boats, by growing heavier, sink the deeper
 “ into the Water ; and that the Water-men determine
 “ from hence, when their Vessels are loaded sufficiently ;
 “ and that 'tis Time to carry them back to the Place
 “ whence they came.

183. *Clar*. “ This proves to me, how exceedingly
 “ advantageous it is for Persons to live in the Neigh-
 “ bourhood of a great River, when their Fields are not
 “ very abundant in Flowers, or sufficient to support our In-
 “ sects during every Season. I conceive that Bees, by taking
 “ a little Voyage upon a River, and enjoying the Spring
 “ of a dry Country, with the Autumn of a fat shady
 “ Soil, may thus be supported the Year round. But in
 “ order to do this, the Owners of Hives must live near
 “ a navigable River, otherwise what I just now described
 “ would be defeated ; and you know that many Places
 “ have not such an advantage.

184. *Eugen*. “ This Defect may be supplied by Land-
 “ carriage. *Columella* informs us, That the *Greeks* con-
 “ stantly conveyed every Year Bees, from *Achaia* to
 “ *Attica* ; and this because, that at the Time that the
 “ Flowers in *Achaia* are gone, those of *Attica* began to
 “ blow. *Montfort* relates, That the People of the
 “ Country of *Juliers* used the same Practice ; and that,
 “ at a certain Season of the Year, they carried Bees to
 “ the Foot of Mountains covered with Thyme, and that
 “ of the wild Kind. I, indeed, borrow these Instances
 “ from remote Times and foreign Countries ; but as
 “ People are apt to subtract many Things from these
 “ Relations ; I must give you an Example of what is
 “ done among ourselves, in the Centre of *France*, and
 “ of which you yourself may be Eye-witness. One of
 “ those Men born for the Improvement of Arts, and
 “ whose Name deserves to be transmitted to Posterity,
 “ *Mr. Proutaut* makes his Bees travel like the *Greeks*
 “ of *Achaia*. This ingenious Artift has set up a Ma-
 “ nufacture, for whitening Wax, in the Diocese of *Or-*
 “ *leans*

leans, and there keeps a great Number of Hives.
 This Spot is one of those in which Flowers become
 rare or scarce very soon; and where few or none are
 seen after the Corn is ripened. He then sends his
 Bees to *Beauce*, or *Le Gàinois*, in case it has rained
 in those Parts. This Journey is about Twenty
 Miles, which he makes them take. But, if he con-
 cludes that the Bees could not meet, in either of these
 Countries, wherewith to employ themselves advan-
 tageously, he has then carried them into *Sologne*, a-
 bout the Beginning of *August*; as knowing that they
 there will meet with a great many Fields of Buck-wheat
 in Flower, which will continue so till about the End
 of *September*.

185. *Clar.* "I can easily conceive, that Hives may
 be carried to a great Distance in Boats, This Car-
 riage is gentle, and can hurt Bees very little. But
 then, methinks, the conveying of them by Land,
 must be attended with many Difficulties. In what
 Manner does your Industrious Artist act on this Oc-
 casion? I presume that he is not so polite as to con-
 vey our Insects in a Coach or Litter.

186. *Eugen.* The antient Historians had not ac-
 quainted him with the Method, by which the *Greeks*
 used to send away their Bees by Land: But here fol-
 lows his Contrivance; which he practises with Success.
 The first Care is, to examine those Hives, some of
 whose Honey-combs might be broken or separated, by
 the jolting of the Vehicle; they're made fast one to the
 other, and against the Partitions of the Hive, by means
 of small Sticks, which may be disposed differently, as
 Occasion shall show. This being done, every Hive is
 set upon a Packing-Cloth, or something like it, the
 Threads of which are very wide: Then they turn up
 the Sides of this Cloth, and lay them on the Out-side
 of each Hive; and tie them together with a Piece of
 small Pack-thread, observing to wind it several Times
 round; they afterwards place in a Cart, built for that
 Purpose, as many Hives as it will hold. The Hives
 " are

are set two and two the Length of the Cart. Over
 these others are placed, which make, as it were, a
 second Lay or Bed of Hives. These must be always
 put topfy-turvy; 'tis for the Sake of the Honey-combs,
 and to fix them the better, that the Hives are disposed
 after this manner; for such as have no Honey-combs,
 or very small ones, are placed in their natural Situa-
 tion: Care must be taken in this Stowage, not to let
 one Hive stop up another; it being essentially neces-
 sary for Bees to have Air, and 'tis for this Reason that
 they are wrapped up in a coarse Cloth, the Threeds
 of which were wove very wide, in order that the Air
 may have a free Passage, and qualify the violent Heat
 which these Insects raise in their Hives, especially,
 when they move about very tumultuously, as often
 happens in these Carts. Those used for this Purpose
 at *Yeure*, hold from thirty to forty eight Hives. As
 soon as all are thus stowed, the Caravans set out. If
 the Season is sultry, they travel only in the Night;
 but, in cool Days they make a proper Advantage of
 them. You'll imagine, that they don't ride Post.
 The Horses must not be permitted even to trot; they
 are led slowly, and through the smoothest Roads. If a-
 ny Hives are void of Honey-combs; or have not suf-
 ficient to support the Bees during their Journey, which
 is more than of one Day, they are made to stay in the
 Place where they happen to be. The Sort of Hives we
 are speaking of, are taken out of the Cart; and are set
 upon the Ground; and after removing the Pack-cloth,
 an Aperture is made at the Bottom of every Hive,
 by which the Bees issue forth, in order to procure
 themselves Provisions abroad. The first Field they
 come to serves as an Inn to them. In the Evening,
 as soon as they are all returned, the Hives are shut
 up, and being placed again in the Cart they proceed
 in their Journey. When the Caravan is arrived at
 the Journey's End, the Baskets are set up and down
 in the Gardens, or in Fields adjacent to the Houses
 of

"of different Peasants, who for a very small Reward undertake to look after them."

187. 'Tis now Time to think what Hives to keep, and what to kill; you know I have been all along advising you to preserve the best, as those that will turn to the best Account next Year. When you have killed the worst, in early Places in *August*, in later in *September*, and in general when they have given over Work, you should immediately take Care of the Preservation of the Remainder.

188. Whenever you find your Bees giving over Work, begin to lessen the Entries to their Hives by Degrees. This is a very necessary Thing in this Time of the Year; for if the Weather is fine, and the Provision scarce, the Stronger, as I have said, will plunder the Weaker: To remedy which in the Beginning, the straitening of the Doors is the best Expedient.

189. If you incline to keep an Hive that you suspect to be weak, this is the proper Season for feeding it, which you may do with the Dreg of the Honey of those you have killed, observing the Directions I gave concerning this Matter for the Spring; only you are not now to give them a Dose, and then to wait to know by the Weather, if it is necessary to give them any more; but you are to consider what they will want, and to give it in Doses, until they have got all you design; yet if at any Time you find Honey left over Night, you must remove it next Morning, and give them no more for a Night or two.

190. If you find it necessary to remove the Ecks you put to your Hives, this is the Time for it; if to continue them, to plaister up the Joinings, and all around the Mouth of every Hive, to keep the Rain from getting in.

191. When these Things are done, your Hives all very dry, and the Weather yet good, you must fit them for the Winter by putting Covers over them, or removing them to your Bee-house, to be hereafter described.

192. I have

192. I have now brought my young Practitioner thro' the whole Year with his Bees, have endeavour'd to give him such Directions as are necessary for every Season, and when I have advanced any Thing that I have not fully experienced, I have told him so, in Hopes that others may make further Discoveries. Directions are indeed necessary for a young Beginner, but Application is the Life of all Business, the more he views and considers these wonderful and highly profitable Creatures, he will the sooner learn the Husbandry of them, and become the sooner and the better qualified to give Directions to others concerning them.

193. To such as may be afraid to attempt this Part of Husbandry, by so many and so different Rules and Directions, I say,

194. 1st. There is no safe Way of coming to the Knowledge of any Thing of this Sort, without the Help of a great many Directions and Cautions: When you are reducing them to Practice, you will, on Occasion, find Use for every one of them, and possibly wish for more: It is, without doubt, the Fault of the other Books upon this Subject, that they spend too much of the Reader's Time, being swelled with the speculative Part, which enhances their Price, and give too few, and too general Directions; both which Errors I have endeavour'd to avoid in this small Treatise, that it may be the more generally useful, and become the Property of the meaner Sort, on a small Expence.

195. 2^d. Tho' there are many supposed Cases and Objections, which may never fall in your Way, answer'd here; yet when any Thing extraordinary befalls you in your Management, and perplexes you, you will then be glad of Directions concerning them. You know 'tis easy to manage Husbandry of any Kind, when the Season and Circumstances combine to favour our Design; but when 'tis otherwise, and Things begin to go cross to our Wishes, then the Skill of the Husbandman is known by applying Rules suitable to the Occurrences that happen.

196. So far am I from thinking, that this Husbandry can be made too plain; or that 'tis a Fault to multiply the Number of different Directions concerning it, that I shall for further Instruction to my Readers, and partly to satisfy the more curious Part of them, add a few general Questions and Answers, after I have let them know my Opinion concerning the Boxes, that have been of late so much commended, and are called by the Name of Colonies.

197. I own the Invention is curious, and that the Design to shew a Way how to share of the Fruit of the Bees Labours with them, without putting them to Death for it, is so far inexceptionable, that I like the Humanity of it, and wish I could find it as profitable as it is merciful. The Favourers of this Invention alledge that when there is so great a Number of them in one Family, they turn to much better Account, than in the ordinary Way: I shall endeavour to shew, that the Ends they propose are not obtained by their Method.

198. 1st. I'm afraid 'tis found by Experience, that Bees, especially in this Country can do little more than maintain themselves thro' the Year, even in the best Seasons. How then can you expect any great Share of their Honey without killing them? 'Tis for this Reason that I have advis'd my young Beginner to keep always his richest Hives over Year, because some Seasons will put the best of them to a Pinch.

199. 2^d. The Method seems contrary to their Way of doing; for they lay their Eggs and hatch their Young in the middle Parts of the Combs and Hives, where by they get them the better surrounded and defended against all Hazards and Inconveniencies, and by the greater Heat there, than more outwardly, they get them the sooner and safer hatched; yet I shall not deny, that in the warm Months of *June* and *July*, Mr. WARDER may have seen some of the Brood in Cells at the Windows; but, I think every one of the Family should know best what Part to act when they are all in one House together; whereas when they are obliged to perform this Office in

two or three distinct Boxes, they are not capable to execute it so well.

200. 3d. 'Tis difficult, and sometimes impossible, to keep them from swarming or casting.

201. 4th. The Honey you get this Way is both very little in Quantity, and very bad in Quality, being full of young Bees, Bee-bread, and such Stuff as you commonly find in old Hives.

202. 5th. Seeing it is evident, that the Thriving and Success of the whole depends on the Welfare of a single Bee, the Sovereign, I humbly think 'tis too great a Risk to hazard a numerous Colony, and so great a Stock upon his single Life; besides, it seems to be putting too much Generation-work upon him: Tho' my Opinion is, that the Product of Bees is much better, in Proportion, when there is a greater Number of them together, than when there are but few, yet I do not say, but we may exceed, especially when they are disposed in three distinct Families. Then the Sovereign can neither have so distinct Knowledge of what his Subjects are doing, nor can they be so easily satisfied, as otherwise, of his Welfare; which Uneasiness on both Sides will, no doubt, give them great Disquiet, and oblige them to travel frequently from one of these Apartments to another, which must exceedingly retard their Work.

203. I might advance several other Arguments against this Way of Colonies, such as the Difficulty of getting the Bees to separate from the Honey, when you take away a Box from them, which is not so easily done as the Favourers of that Project would make you believe: But I suppose I have said enough, to dispose you to think twice, before you hazard much upon it, and (those who are of another Opinion may try the Experiment when they please; I wish those, who have done it, have fairly computed, and fully considered the Difference of the two Ways before they recommended Colonies. Come now to my general Questions, which I told you were partly curious; and partly useful.

I

204. 1st. Whe

204. *1st*. Whether are they young or old Bees which make up young Hives?

205. *Answer*. A young Hive consists of a Mixture of both, and 'tis best for the common Good, when the Composition is pretty equal; for when too many young Bees come off to the young Hive, then the old Hive consists almost wholly of old ones, and then in the End of July, when the old Bees die, you will sometimes observe an old Hive, that looked very promising and thriving after Swarming, suddenly come almost to nothing.

206. On the other Hand, you will find a young Swarm in a hopeful Way, of making a strong Hive for standing out the Winter, which yet will, by and by, frustrate your Expectation, when the old Bees die; for thereby their Number is so impaired, that they are not able to do much good for that Season.

207. Thus it is plain, that when a Swarm consists of near an equal Number of young and old Bees, both the old Hive and itself bids fairest to thrive.

208. *2d*. How long do Bees live?

209. *Answer*. The Bees that are hatched in the Spring, live until next Year about the End of July. Hence it is, that tho' your Hive be very throng, and appear daily increasing, yet when this Time of Mortality comes, you will find them considerably decrease.

210. The Reason why they are more sensibly observed to die at that, than any other Time, is, Because the greatest Part of them are hatched in the Spring, and so they come to die in greatest Numbers in that Season: The rest of the Summer their Hatching is more gradual, and so their Death is not so perceptible.

211. What was advanced near the Beginning of this Treatise concerning an Hive of Bees, who have lost their King in Winter, or Spring, their dwindling to nothing by the End of July, is a Proof that they are no longer lived; besides, if you view your Hive in the Beginning of July, you'll easily perceive great Numbers of them with Symptoms of old Age about them, having the Down worn from off their Back, and their Wings ragged;

god; but if you observe them in *August*, after the dying Time is over, you'll see no such Marks of old Age about them.

213. If my Readers would be further satisfied concerning this Matter, they may look what Dr. WARDER says upon the Head,

Whether is it best to keep an old or a young Hive, and how long may an Hive be kept?

214. *Ans.* I have already given you a general Direction to keep the strongest, whether old or young; and shall not here resume the Reasons; but when the Question is betwixt a young and an old Hive of equal Weight; then I answer, 'tis best to keep the old one, and that for these Reasons: *1st*. The young one will afford you the best Honey; by very far. *2^{dly}*. The old Hive will yield you as good a Product, which I think will determine you to keep it.

215. As to the second Part of the Question, I answer, That I do not know from Experience how long an Hive may be kept; but I am of Opinion, that it may be preserved a long Time; for 'tis plain from what has been said, That it does not labour under the Inconveniency generally believed, that the Bees grow old and lazy; it being made appear, that they are as young in an old Hive as in a young one.

216. Thus you see, that, by keeping old Hives, you have this Advantage, that you get Virgin-honey for many Years together, which will give you more Profit if you sell it, or Pleasure if you eat it, than the Honey of the old Hives would do, and yet the old Hives will serve full as well for Propagation; but yet, if the same Hive is kept for many Years, the Combs will become black and thick, with the Skins left by the young Brood, the Straw of the Hive will be apt to rot and become musty, and these must prove inconvenient, offensive, and infectious to the Bees; as also the Sticks within the Hive will most probably fail, and become insufficient for supporting the Weight they have to bear.

217. *4th*. What Weather is best for Bees?

218. *Ans.*

218. *Ans.* Calm warm Weather with soft Showers now and then: Wind is very destructive to them, not only by retarding them in their Work, but it even beats them against Walls and Trees, &c. and kills many of them: Cold Weather pinches them so that they cannot go abroad, and when they do, they find not the Flowers so rich of Matter, for Honey or Wax, as when the warm Beams of the Sun play upon them, and exhale that Moisture which is fit for their Purpose.

219. Soft Showers likewise contribute much to their Advantage, especially in Soils that are naturally dry and sandy. There in Drought the Flowers grow so dry and parched, that their Moisture is quite dried up; the Bees find little Provision abroad, and so make small Progress; but where the Soil is naturally moist, bad Effects by Drought are but rarely felt. Sudden violent Showers of Rain, but especially Hail, is very prejudicial to them; for when a warm Blink of Sun-shine invites them abroad, and then a plump Shower surprises them, multitudes of them will thereby perish, especially if it is cold, or of Continuance; but if it blows soon over, and the Sun beats very warm again, this will tend greatly to recover them.

220. *5th.* What Fields and Flowers yield them most, and best Matter for Honey?

221. *Ans.* There are different Flowers in the different Seasons, that afford them Plenty for both Honey and Work, such as, early in the Spring, the Blossoms of Goose-berry Bushes, Sallows, Rose-mary, the Plane-tree and Whins; these, as far as I remember, are of the greatest Use to them, and afford them the most of their Food, and work early in the Year, tho' there are others that cannot be easily got in Plenty, as Crocuses, black Hellibore, Imperial Crown, Scurvy Grass, Wall Jelliflowers, and a great many more, all Flowering before the Middle of May.

222. The principal ones that succeed, are, the wild Mustard, which is the Chief, the Apple, Pear, and other Fruit-trees, white Clover, Woad, Poppies, Garden Mustard,

Sard. Thyme, Sage, Hyssop, Kail, on Colewotts of all Kinds, Turnips and Broom.

223. Then is the End of Summer and Beginning of Harvest, the principal ones are Heath, Ragweed, Flax, Hemp, Lime-tree, and a great many Flowers in late Meadow-ground, and hained or kept Grass. It is to be observed, that tho' most of these Flowers yield Work, as the Flowers of Rutz, Broom and Poppies, yet some of them afford only Honey, such as Clover, Goos-berris and Thyme.

224. From what has been said, 'tis evident, that the Fields that abound most with these Flowers, are the best for Bees, and thus it is, That some Places of our Country, are best for them in the Beginning of the Season, and other Places in the End of it; for Instance, The Sea-coast, generally speaking, affords them the earliest Flowers in greatest Abundance; the hilly Grounds and Muirlands the latest; because there the Heath and Meadows are most plentiful.

225. For this Reason, if any will give themselves the Trouble, to remove Hives from the Sea-coast in the End of July, when the Flowers there are gone, to any other Place where are uncut Meadows or Heath, or both, they will find a great Advantage by it.

226. This a Gentleman, even of our own Country, has practised with very good Success, and has found, that when his Bees had almost given quite over working, because the Flowers were gone; upon his transporting them to Meadows or Heath-grounds, they have set to Work again as briskly as ever.

227. For this Reason, when he lived on the Sea-coast, he used to carry his Top-swarms, the very Night they were hived, to some Place convenient for Muirs and Meadows, where he allowed them to stand until the Season of their working was over.

228. He had two Advantages by removing the young Swarms rather than the old Hives. 1st. They were easiest carried, being lighter. 2^{dly}. They were not in Hazard of seeking the Way home again, which the old

old ones do, if they are not removed to a due Distance, which leads me to the sixth Question.

229. 6th. To what Distance will Bees fly for Food?

230. *Ans.* They commonly fly to a Mile's Distance, and sometimes two, as those who live a Mile from Heath, may observe, by the Work their Bees bring home upon their Tighs, when the Heath is blossomed. You may know pretty well, what Flowers are blown in the Field, tho' you go not out of your Garden, for the wild Mustard yields Work of a Colour, betwixt yellow and green, and the Dust of the Flower paints them, especially their Fore-head, the same Colour: Broom-blossoms yield bright yellow Work, and dyes their whole Body that Colour: The Heath affords Work of a faintish Green, or Ash-colour, but does not dye their Bodies.

231. Bees have been found in Heaths, at two Miles Distance from any Hive, tho' rarely, yet they can make little Progress, if they are obliged to travel a full Mile, and few Bees goes so far. These that go cannot make many Journeys in a Day, the Distance being so great, and they are much exposed to Accidents when so far from Home.

232. The main Design of this Question being to know, to what Distance 'tis proper to remove Bees, either to prevent Fighting, as you was advised when treating upon that Head, or for getting more Provisions against Winter, I shall speak thereof as the Gentleman, just now mentioned, says he has Experienced.

233. The first Time he removed Bees, having carried them only half a Mile, he found that a great many of them returned, gathered in Clusters upon the Stakes where the Board stood before the Removal, and when they could find no Lodging-place, some of them made their Way back to their own Hives, but the rest, in a humble Way, begged Quarters from the Hives left in the Garden unremoved.

234. Next Season he removed them a full Mile, and found, that some of them still returned, but not in such Numbers, as much to weaken the Hive or Hives they left.

left. They hovered about the Place from whence they were removed, and frequently resorted to the rest of the Hives, looking for their own Abode; but weary of their fruitless Endeavours, they took Lodging where they were made most Welcome.

135. The following Season, he tried them at the Distance of a Mile and a half, and found a few return even from thence.

236. From these Observations he concluded, that they may with Safety be removed, if you take them a full Mile off, and that you will find Advantage by taking them further; for if you please to take the Trouble, to weigh two of your Hives, and remove one of them as directed, you will find that which was transported much heavier, in Proportion, than the other upon weighing them again. Now I humbly think that this Matter of the removing of Bees, has been pretty fully treated of in this and the former Pages.

237. 7th. What Flowers yield best Honey?

238. *Ans.* I shall not pretend to give my Reader full Satisfaction in this Matter, because I neither know what is the best Honey, those pretending Skill in that Affair being divided in their Opinions concerning it; nor can I tell what Sort of Honey every particular Flower affords; but I shall endeavour to inform, what Honey gives the greatest Price in this Country, and what Flowers contribute most to the producing of it.

239. I told you before that Bean Blossoms, wild Mustard, Meadows, mowed or kept Grass, and Heath, afford the most of our Honey in this Country. According as these are plenteous or scarce, so will the Colour of the Honey be found to be; that which is whitest is thought best, the further it receds from that Colour, it is esteemed the worse.

240. There are two Sorts of wild Mustard, the one commonly called *Skeldocks*, the other *Runches*. Some Fields will have Plenty of the one, and none of the other, & *vice versa*. *Skeldocks* yield Yellow, *Runches* very white Honey, Meadows make white Honey, Heath reddish

reddish. These Fields therefore, where only Runches abound among the Corn, and where no Heath is near, will produce very white Honey. If there is a Mixture of either the Heath or the Skeldocks, the Honey will be yellowish, but not so yellow as if there were no Runches.

241. In Places where both Runches and Heath abound, you may easily in the End of the Season discern in a fine Honey-comb, the upper Part of it of a white Colour, the lower, which was last filled, and from the Heath, of a reddish Colour.

242. In Places where there were few Skeldocks, and not much Heath, but a great Deal of Meadow and kept Grass, I have seen the Honey of a fine beautiful Colour betwixt green and whitish Yellow, and so in different Parts, the Colour alters as these Flowers prevail.

243. I remember no other Flower, that so much abounds, as to determine the Colour, except the Flower of the Ragweed, which in some Places is very plenteous, and may give it a yellow Colour, tho' neither Skeldocks nor Heath are near.

244. I shall here take Occasion to speak of the Consistence of Honey, that which is hard, is most valued, *ceteris paribus*, and justly so; let this be put to the Trial, and you will find that the thick, will sweeten a great Deal further than the same Quantity of the thin.

245. There are two Things which have Influence on the Consistence of Honey. *1st.* The Weather. *2dly.* The Season of the Year. If the Weather is dry, the Honey will be of a harder Consistence, and, on the contrary, when 'tis rainy, it abounds with watery Parts, which the Bees suck up with the Honey, and so it is softer.

246. Again, the Honey which is gathered early in the Season, is harder than that which is gathered in the End of it; because the Heat, both of the Sun and the Bees themselves, has more Time to exhale the Water out of it, and so leave it harder than the other made thereafter.

247. Hence

247. Hence it is, that the Honey of old Hives is harder than of young ones; for you know much of their Honey is gathered early, even before the first Swarm goes off, which therefore cannot miss to be thicker than the Honey of Hives of a short standing; so if there were not several other Considerations to cast the Balance, the Honey of old Hives would be best.

248. *Quest.* 8th. Can a Field be over-stock'd with Bees?

249. *Ans.* No doubt but it can, tho' this happens more rarely than People imagine. You may easily believe, that the Flowers of a Field consisting of a Circle of two Miles Diameter, will not be soon exhausted, or else it is a very barren Soil.

250. I have known, in a little Sea-coast Town, upwards of Fifty Hives all in a thriving Condition at one Time; now, how many may another be supposed to maintain, that has not the Sea to take up one Side of it? If this is duly considered, you need be in no great Fear of over-stocking your Ground. I say no more upon this Head.

251. *Quest.* 9th. Will an Hive cast a Top-swarm before it is full of Bees?

252. I answer in the Negative, never having observed a Top-swarm go off till the Hive was quite full, tho' every Body knows that it will cast a second, or third, when it is very far from being full. If it be here questioned, why I asserted that Bees cannot be kept from swarming, when they may be so easily supplied with an empty Box, before the rest are quite full? I answer, That the giving them a new Box is not so properly an Enlargement of their House, as adding another House to their former one, and is much the same Thing as if you would artfully join an empty Hive, to the Entry of that one ready to cast, with a Design to prevent the Casting, which will not hinder it, for they will only use it as a Vessel to convey them to their proper Apartment.

253. They like, as I said before, to live together, till, being pinched for Room, they send off a young Family

mily to provide a Lodging for themselves. But if you enlarge that Apartment after the usual Manner, they will not Hive till they fill it up again; yes, tho' you continue to enlarge it from Time to Time, till the End of the Year.

254. *Quest.* 10th. Which is the Way of the Formation and Progress of Bees?

255. *Ans.* The Bee lays an Egg in the Bottom of the Cell, which soon comes to appear in the Form of a very small Worm, lying in the Bottom of the Cell, from which it advances gradually with its Head towards the Mouth thereof, and by Degrees takes the Shape of the Bee, being all this While of a white Colour, and fed by the old ones, much in the same Manner that Pigeons and small Field-birds feed their Young, till it arrives at a certain Degree of Ripeness. Then it is sealed up in the Cell, in the same Way the Bees do the Honey, for two or three Days, or longer, in which Time it takes the Colour of a Bee, and then breaks thro', and goes abroad a ripe full grown Bee. Any Body who wants a further Description of this, may consult Dr. WARDER.

256. *Quest.* 11th. What is the Use of the Bee-bread, and how prepared for that Use?

257. *Ans.* The Bee-bread is for nourishing the young Bees, and is thus prepared: The old Bees put it in the Cells, and add a convenient Proportion of Water and Honey to it, which being wrought up to a certain Degree of Fermentation, it becomes proper Food for the Young, and is given them in the Way set forth in the Answer to the former Question; but, as it is evident, that a great many young Bees are hatched so early in the Spring, that they cannot get Bee-bread of the same Season, their Provision must certainly be, by a Store laid up in the End of the Year preceeding, which is done by half filling a great many of the Cells with it, and filling them up with Honey, which preserves it fresh and fit for Use. This they take and mix in the Manner just described,

described, which feeds the Young, till Provision can be found abroad.

258. *Quest.* 12th. What Size of Hives is best ?

259. *Ans.* You have been told that the ordinary Size in our Country, contains about a Peck and three Lippies of Barley *Linlithgow* Measure, and long Experience hath taught, that any Size much below or above that, does not answer so well ; for when they are very small, 'tis less worth while to attend them, and when very big, they do not produce in Proportion to their Bigness : Besides, there is too great a Hazard run upon the Life of a single Bee (the King) as was observed in one of the Objections against Boxes.

260. *Quest.* 13th. In what Time does a Bee come from an Egg to full Maturity ?

261. *Ans.* About seventeen Days ; for I have known a first Hive, in warm Weather, cast a Swarm in that Time, which is a Proof of it.

262. *Quest.* 14th. What Number of Bees may be supposed to be in an Hive ?

263. *Ans.* I reckon, that in an Hive of the ordinary Dimension aforesaid, there will be about twelve Thousand Bees ; but before Casting, I doubt not, but there will be double that Number : If you'll consider, how long every Bee must take to bring in her Loading, and yet what vast Numbers of them are always going in and out at the Entry to the Hive, you'll easily be induced to think so. The Way to number them is : After they are killed, to fill any small Vessel full of them, try how many it contains, and then try how often the whole fills it.

264. *Quest.* 15th. What is the Bee-bread, and whereof are Combs made ?

265. In Answer to these Questions, I shall only give you the Opinion of others : As they do not agree, I leave you to form a Judgment thereof to yourself, from their Opinions and your own Observations.

266. Mr. *Chalmers* in his Dictionary, says, " That Wax is not the Excrement of the laborious Bee, as
" the

“ the Ancients, and after them many of the Moderns
 “ have imagined. ’Tis properly a Juice exuding out of
 “ the Leaves of Plants, and adhering to the Surface
 “ thereof, from which it is scraped off by the Bees with
 “ their rough Thighs, to build their Cells withal; *Boer-*
 “ *haave*, says he, is of this Opinion.

267. “ Again, says Mr. *Chalmers*, The Wax being
 “ a hard Substance, is gathered only by the Fore-legs
 “ and Chaps, conveyed thence to the Middle-legs, and
 “ thence to the Middle-joints of the Hind-legs, where
 “ there is a small Cavity, like the Bowl of a Spoon, to
 “ receive it, and where it is collected into Heaps of the
 “ Shape and Size of Lentils.

268. “ The Bee arrived at the Hive with its Load of
 “ Wax, finds some Difficulty of unburdening itself of so
 “ tenacious a Matter; frequently being unable to lay it
 “ down, it calls for Assistance by a particular Motion of
 “ its Legs and Wings, upon which a Number of its
 “ Companions straight run to its Succour, and each
 “ with his Jaws takes off a small Quantity of Wax, o-
 “ thers succeeding till their loaden Fellow be disbur-
 “ dened.”

269. The Author of a small Manuscript gives the
 following Answer to both these Questions. “ The Bee-
 “ bread, says he, is the Farina, or Dust of the Flowers,
 “ which they gather in Mouthfuls. Then they take Wing,
 “ and in Time of flying take it out of their Mouth
 “ with their Fore-legs, and put it upon the Thighs of
 “ their Hind-legs. Then they pitch again upon the same
 “ or another Flower for another Mouthful, and repeat
 “ the Operation so often, till they get a sufficient Quan-
 “ ty to carry home, which is always coloured accord-
 “ ing to the Flower from whence they take it. This
 “ Performance of theirs is easily perceived, when they
 “ pitch upon a Flower that abounds with this Farina;
 “ such as the white Poppie.”

270. “ The Combs, by a great many People, are thought
 “ to be made of this Bee-bread, which they carry in upon
 “ their Thighs; but, tho’ ’tis no Wonder that Beginners
 “ fall

“ fall into the Mistake, 'tis surprising that any who pretend to write on this Subject should fall into the Blunder, particularly Mr. *Bradley*, who says, in the first Volume of his Book, That the Wax is the Dust of the Stamina of the Flowers; and in another Page alledges, they keep a Part of this Wax in their Cells for making more Combs, and for some other Purposes: His Error plainly appears from the following Observations.

271. 1st. “ The Bees of a new cast Hive bring nothing home upon their Thighs for some Days; and yet, if you look into it, you'll find a good many Combs made.

272. 2^d. “ These Combs are all pure White, which they would not be, if made of Stuff of very different Colours.

273. 3^d. “ If you take this Substance which they bring upon their Thighs, and try it with Fire, it will neither melt nor burn, as the Wax does, and in cold Water it dissolves, which Wax does not.

274. 4th. “ To what Purpose would they bring so much Wax to an Hive, that is as full of Combs as it can hold, and yet every Body knows that they are as busy bringing home Loads on their Thighs to old Hives, as young?”

275. A curious Bee-master, in the Way of Boxes with Glass-windows, says, “ He has often observed these industrious Creatures take an admirable Method of unloading themselves. By their two Foremost-legs they hing, says he, upon the Edge of an empty Cell above them, join their two Hindermost-legs together, thrust them into an empty Cell below, and with the two Middle-legs scrap off their Burdens, which drop into the said empty Cell; then away they fly, and other Bees come and dispose of it in a more compact and orderly Manner. Thus they continue, says he, to repeat these Operations, until the Cell is full; but perhaps this they only do when the other Bees neglect, or rather have no Time to give them Assistance.”

276. Now

276. Now I proceed to inform my Reader, whereof the Combs are made, which is out of a Substance they carry home in their Bellies; but whether this is a peculiar Juice they get in particular Flowers, or if it is a Composition of several Juices, so prepared in their Bodies, as divests it of Sweetness, and brings it to a due Consistence, I shall not pretend to determine. Whatever it is, 'tis plain they bring it out of their Mouths, and apply it round the Edge of the Cell, much in the same Manner as the Swallow puts the soft Clay round the Brim of its Nest, when it builds it.

277. This Performance may be seen by lifting up the Back-part of an Hive, when the Bees are throng at Work, where you may perceive a great many of them so employed at the same Time, in the most agile Manner you can conceive, whilst others, in a more composed Way, are giving the Work the finishing Stroke, by brushing and garnishing it over with their forked Tongues, and in this surprising Architecture of theirs, there are several Things very remarkable, such as,

278. 1st. The Hexagonal Figure of every Cell.

279. 2^d. How exactly they place the Bottom of every Cell upon the Partition in the Middle of the Comb, not opposite to the Bottom of those Cells on the other Side of the Partition; but, on the contrary, the Bottom of the one that is opposite to the Side-walls of the other, which tends much to strengthen the whole Fabrick; and all this exact Structure is framed, for the most Part, in the Midst of a Throng, and in utter Darkness.

280. 3^d. These Combs that are designed for receiving and keeping the Honey, which are principally those next the Hive, have their Cells framed not directly Horizontal, but inclining a little upward for keeping the Honey from falling out, whilst the Cells of the other Combs in the Middle of the Hive, designed for propagating the Young, ly directly Horizontal as fittest for that Purpose.

281. *Quest.* 16th.

281. *Quest.* 16th. How much Honey will a good Hive gather in a Week of good Weather?

282. *Answ.* When the Bees are intent upon gathering Honey, and are not much employed in any other Affair, they will make a *Scots Pint*, or five Pounds *Dutch Weight*.

283. *Quest.* 17th. Can Bees use any other Thing for Food but Honey?

284. *Answ.* No doubt they can, such as Syrups, Worts, and Decoctions of several other sweet things, but I do not advise the Use of these but in absolute Necessity, because I know not but they may be hurtful to their Constitution, and so apt to bring Diseases on them.

285. *Quest.* 18th. What Number of Hives may be kept over Year in a Bee-Garden in the Country, and what, by a modest Computation, may be reckoned the Product of these Hives for a Year?

286. *Answ.* If you set a aside twelve to keep, which is certainly a very moderate Number, you may next season look for twelve at least to kill, and twelve more to keep again. These you kill, you may well suppose to afford four *Scots Pints* of Honey each, in all Forty eight Pints, which, at 3 s. 4 d. per Pint, is eight Pounds *Sterling*. If you incline to keep Twenty four, which is still a moderat Numbere, then you may Expect a proportional greater Profit, sixteen Pounds.

287. It may likewise be supposed that a Hive that had four Pints of Honey in it, has also one Pound of Wax *Dutch Weight*, which, at one Shilling per Pound, is, for the Twenty four Hives, 1 L. 4 s. and which added to the sixteen Pounds makes 17 L. 4 s. *Sterling*. No small Sum to begot yearly after some Years, on no Expence but the Price of an Hive or two at the Beginning, (for it shall be herein after shown, where a fund will arise for the Price of Hives and other Incidents) and that by every Body who lives in the Country, with small Trouble, and little Avocation from other Business.

288. DR. WARDER, proposes the keeping of one hundred and sixty Hives: But this might cause great Confusion

Confusion, for let it only be supposed that a third, a fourth, a fifth, or even a sixth of that Number should Hive in one day, which may very probably happen, what a Disorder would there be, how many Inconveniences would follow? such as two or three Swarms going together; others dividing, and not knowing for the Throng how to join again; others flying quite away; while you have not Time to stop their Flight. These or several other such like Accidents might fall out.

289. If any object that the Calcul of Profite is too low, and say, that one Hive with another, two might have been reckoned to produce three; I answer, I chused to be moderate, that my Reader may be agreeably disappointed, and that a separate Fund may arise, out of the additional Profits; for answering the Price of Hives and Incident-Charges.

290. Here I shall give Directions concerning the killing of the Bees, taking the Honey, and preparing and using the Wax, which makes a considerable Article in Commerce; the Consumption thereof, thro' the several Parts of *Europe*, being very great.

291. As to the killing of the Bees, the best Way is with Brimstone, whereof melt a proper Quantity in an Iron Laddle over a slow Fire, then take some pieces of Linen Raggs, and dipp them one after another in the melted Brimstone, twisting them about till they grow cold and firm, cut them in Pieces about three Inches long, then take three green Twigs and cut a slit in the End of each of them, into which thrust the Brimston-Match; then dig a Hole in the Earth near the Hive you are to kill, about a foot deep, and almost as wide as the Brim of your Hive, then thrust your three Twigs, with the Brimston-matches, into the side of this Hole at different Places, more then half Way to the bottom, and when you have kindled the Match, lift your Hive, and set it over the Hole, Putting the Earth round it to keep in the Smoke, for Ten or Twelve Minutes, in which time you are frequently to beat the Hive on all sides with the Palm of your hand, to cause the Bees fall down.

292. All

292) All your Utensils for the Honey having been before prepared, such as large Pewter-dishes, Sives, Knives, and Spoons, you are immediately to fall to Work, while the Honey is warm and thin, and having pulled out the Sticks, the great Ends whereof I directed to be left without the Hives, you are next to take out the Combs one after another, which you are to give to different Hands some whereof are to be employed in cutting off the waste Parts of the Combs, and separating those Parts of them which are stuffed with Bee-bread, from those which contain the pure Honey, while others are cutting down these pure Honey-combs in thin Slices into the Sives; first, observing to cut off all the sealed Mouths of the Cells, so as the Honey may come the sooner out and run thro' the Sives, which are to be set upon the Sticks you drew out of the Hives, laid over the Pewter-dishes; which Sieves may be made larger and wider in the Holes, than those commonly called Soven [Flammery] Sives; For altho' Bits of the Wax or Combs go thro', they do no Harm to the Honey, but come up in a Stum upon the Top; but by all Means take Care to keep your Honey free from Bee-bread.

293. When the most of it is past thro' the Sives, and it begins to drop very slow, you may put what you have got in convenient Pats, and set the Dishes and Sives before a moderate Fire, now and then stirring up the Combs with a Knife. The gentle Warmth will make it pass the better; but you'll get more good Honey, if you put a Plate over a Vessel full of very hot Water, and the Sive with the Combs upon the Plate; for the Heat will be communicate to the Combs, and make the Honey drop the more freely, without melting the Combs: The Plate should cover the Vessel containing the Water, and the Wax and Honey in the Sieve the Plate as near as can be; and when no more will come, put the Combs in a Pan over a slow Fire, and wring out the rest with your Hands, which keep for feeding your Bees.

294. A Lady of my Acquaintance informs me, that she uses to purify Honey, by setting a Can with it on a

Matt of Hay or Straw, for Fear of breaking the Can, in a Kettle, Pot, or Pan full of Water, putting the Kettle with the Can on the Fire, and boiling the Water, which after a competent Time, melts the Honey; and as it melts, and thereafter cools in the Can among the Water, throws up Wax and Refuse; which being scummed off, the Honey thus purified, becomes more medicinal, looks better, tastes sweeter; is less apt to cause Colicks, and proves qualified for keeping many Years; whereas this being neglected, it often ferments in Summer, and is damnified.

295. For preparing the Wax, take those Balls or Globules which are wrung out from the Dreg of the Honey, and put them in a clean Kettle, or Pan over a moderate Fire; with a sufficient Quantity of Water, always steering it about till it boils, and when you find it all melted, take it out by Laddle-fuls, putting one or two at a Time in a large Bag, sewed in the Shape of a Funnel, commonly called *Hippocrates's Sleeve*, made of thin strong Canvas, and so long as the Upper-part may come over the End of a Deal-board, which is to rest upon your Breast, with the other End in a Vessel fit to receive the Wax, which you must press out with a Piece of Wood, made for the Purpose, much after the Way that Tanners dress their Leather.

296. When you have got it all past in the aforesaid Way, which I have found to be the best, gather it again, and put it in a clean Kettle, with a convenient Quantity of fair Water, and melt it slowly over the Fire; you may, or may not, put it again thro' the Funnel; but, ere cold, scum it with a Tyle, or Piece of wet Wood, and cast it while yet warm in Wooden, Earthen, or Metaline Moulds, or in any Vessel which gradually widens to the Brim, having first anointed it with Honey, Oyl, or Water, to prevent the Wax from sticking; let it stand all Night, then take it out, and cut off the Refuse with your Knife till you come at the pure Wax. Some to purify it, make use of *Roman Vitriol* or *Copperas*; but the true Secret, is to melt, scum, &c. properly; without any Ingredients.

297. The

297. The best is that of a high Colour and an agreeable Smell, and that does not stick to the Teeth, when chewed; 'tis often sophisticated with Rosin or Pitch, coloured with Rocou or Turmerick; the Fæces remaining in the Bag after expressing the Wax, are used both by Surgeons and Ferriers with Success against Strains.

298. The whitening or blanching of Wax is performed by reducing the yellow Sort, first into little Bits, or Grains by melting it, and throwing it while hot into cold Water, or else by spreading it into very thin Leaves or Skins, or cutting it into such by a Knife or a Wheel.

299. This Wax thus granulated or flatted, is exposed to the Air on Linnen-cloths, where it rests Night and Day, having equal Need of Sun and Dew; then they melt and granulate it over again several Times, still laying it out to the Air in the Intervals between the Meltings.

300. When the Sun and Dew have at length perfectly blanch'd it, they melt it for the last Time in a large Kettle, out of which they cast it with a Laddle upon a Table, dented over into little round Cavities of the Form of the Cakes of white Wax sold by the Apothecaries, &c. having first wet these Moulds with cold Water, that the Wax may be the easier got out.

301. Lastly, They lay out these Cakes to the Air for two Days and two Nights, to render them more transparent and dry. This Wax is used for the making of Torches; Tapers, Flambeaux, Figures and other Wax-works. It is also an Ingredient in Plaisters, Cerats, and divers Pomatums, and Unguents for the Complexion.

302. Now, I flatter myself, that the greatest Part of my Readers will acknowledge, that, tho' I should say no more, I have treated this Subject, in a Way more practical and useful than any other hath done; yet I foresee that some will cry out, notwithstanding of what I have said concerning Mr. *Geddie's* Invention; merciless, barbarous Man! Why are you for killing the Bees, those wonderful and profitable Insects, since many Ways,

Ways more advantageous, may be taken to share the Profits of their Labours with them?

303. If any Method is even near as profitable as the killing Way, I wish it was universally practised; so, that you may know which is the best by different Experiments, which if made at one Time, in the same Garden, and with equal Prudence and Care, will the most surely determine which of the Ways ought to be taken, I shall first offer you Directions for keeping the Bees in Colonies or Boxes, with Glass Windows, without killing them, agreeable to Mr. *Geddie's* Invention, for which he got a Patent from King *Charles*, you shall next have Mr. *Thorley's*, as in his female Monarchy, and then the Author's of the Natural History. The two last, so far as I know, are the latest Writers on the Subject of Bees.

304. If you are to try Mr. *Geddie's* Way, an open Bee-House, such as Straw-Hives are commonly kept in, will not do. You must have one, to keep your Colonies in, close with Doors both before and behind; for if your Boxes were exposed to the Beams of the Sun, it would ruin your Colony, in hot Weather, by melting the Honey and Wax.

305. This Method is taken to prevent swarming, for Bees swarm generally for Want of Room, which they get by giving them another Box when the former is full: But it is here to be noted, that this does not always prevent swarming, tho' generally it does.

306. A Bee-House fit for containing six Colonies or Boxes (which if full of good Bees, will at sometimes employ eighteen Boxes) should be twelve Feet long and two broad. In this House all your six Colonies should be set at an equal Distance one from another, but the two outermost no nearer to the Ends than four or five Inches: The Reason is, that you may conveniently put down your Hands, to take hold of the Handles of the Boxes for lifting of them.

307. Make a Frame for the House in this Manner. Each of the two Ends must have two Pillars. The two to the one Side should be each four Feet high, but the two

on

on the other must be a small Degree higher, if you make the House Tofall Way. These must be fastened together with a Piece of Board, about a Foot from the Ground for the Floor to rest upon them, then, with thin Bits across, fix them together in several Places : Next, fasten the two Plates of the House, the one before and the other behind : They must be of whole Deal twelve Feet long and four Inches broad, with a Rabbet in the lower Side for the Doors to shut into ; Nail Rafters to the Plates, and Proportion them in Number and Strength to the Weight of the Roof you intend to put on. The lighter the better if it hold out the Rain. Make four Doors for the Front, and four for the Back of the House : Fix upright Pieces, where they will not incommode you in the Management of your Boxes, to fasten the Doors to. You may put Locks on them if you please, but they should have Rabbets, made by cutting Channels in them, that they may go so over one another, that one Door may keep another fast. In short, this Bee-house must have Doors all along both before and behind, that you may open any Part of it as you have Occasion, and these Doors must go as high as the Eaves of the House will let them.

308. You must also have a Ledge, which must be made with great Care of a Board twelve Feet long, one Inch and Quarter thick and two Inches broad ; it must have a Rabbet of Half an Inch for the front Doors to shut into, and to answer to the Rabbet in the Plate of the House ; but there is no Occasion for a Ledge on the Backside. The Floor must come to the very Outside of the House. And the Ledge must be nailed on all along to the very Outside of the Floor ; so when the Door is shut into the half Inch Rabbet, it will be even. Before you nail down the Ledge, you must cut out, in the under Side of it, six smooth Passages for the Bees to go out and in at, make them four Inches long and half an Inch high. Under each of these Holes you must fix a Landing-Board wider than the Hole, at least two Inches broad, and set it a little slopping, that the Bees may pitch upon it the more conveniently : The Floor must be supported in

two

two or three Places, or it will swag with the Weight, it will have to bear, and put all out of Order.

309. The Doors must be made of well seasoned Wood, and so close that it will not shrink in the Heat of Summer, and let the Bees, much less the Mice, go in and out at the Chinks, or any other Way, but through the Holes cut out for the Purpose in the Ledge under the front Doors.

310. The main Design of the Ledge is not, that the front Doors may shut into the Rabbet of it, but to make Lines of Communication from the landing Boards to the Boxes. And tho' an Inch would be sufficient to contain Holes for the Bees to go through, and the Rabbet for the Doors to shut into, yet to prevent two great Inconveniencies, it must be two Inches broad.

311. *1st*. The Glass-Window in the Foreside of every Box, would then stand only half an Inch from the front Door of the Bee-house, which in very warm Weather would make the Bees so hot, that they would not be able to endure the Heat, or if they did, the Honey would run. In either Case the Colony would be ruined. But,

312. *2^{dly}*. A Straw-hive would come too near the Door, if the Ledge was but an Inch broad, for when you put it into your Bee-house, which you must do at first, as shall be shewn, there is a Necessity that the Entry to it touch the Hole in the Ledge, so the Belly of the Hive would so hang over it, that the Door of the Bee-house would not shut without thrusting back the Hive, which would occasion several Inconveniencies, which are prevented by making the Ledge two Inches broad.

313. Besides the Standards your Doors are to lock into, it is proper to have Hasps of Wood, six before and six behind, which will turn upon Nails, and by which you may keep the Doors so fast in their Places, that the wet Weather will not by swelling, or the hot by warping, put them out of Order. Which Inconveniencies are also in a great Measure prevented by painting the House well: This is likewise useful for the Preservation of the Wood.

314. Take

314. Take care when making your Bee-house, to contrive the Doors so, that none of the Standards where-into they are to lock, may be opposite to any Part of the Boxes, but exactly to the Spaces betwixt Box and Box.

315. The best Way to know exactly where to cut the Holes in the Ledge is, to take two Boxes, and placing one of them within four or five Inches of each End, make a Mark for a Hole in the Ledge exactly opposite to the Entry to each of these Boxes; mark also before altering these two Boxes, the Length of the intermediate Space betwixt them, which being divided into four equal Parts for the four Boxes remaining of the six, you should make Holes in the Ledge for these four Boxes, opposite to the Middle of each of these four Divisions. And then the Entries into the Boxes being placed to the Holes in the Ledge, the whole Boxes will stand at equal Distance from one another, the Breadth of all the Boxes being equal.

316. A House for six Colonies will cost very little more than one for two or three, but if less than six, I think three is the best Number, and any good Workman can easily vary the Rules for a greater Number to answer for a lesser, & *e contra*.

317. The Doors and every Part of the House should be made so close, that the Bees get not in or out, except at the Holes made in the Ledge on Purpose, because Closeness not only defends them against the cold, but preserves them from Thieves and Mice: Care should also be taken that there be no Chinks, or any other Defects in the Boxes, that may let any of the Bees into the House, for they would be lost.

318. The Boards of the Floor should be very smooth and even, that the Bees may not get out betwixt it and the Boxes, and perish. The Cover of the House should be twelve Feet four Inches long, that it may come two Inches over each End, and the House should be strongly fastened; by large Posts of Oak driven into the Ground at each Corner, to prevent its being blown down by high Winds,

319. For making your Boxes, with Iron-handles and Glafs Windows, you must have slit Deals of the best kind, nine or ten Inches broad, and an Inch and Half thick, before they are slit, so that the slit Deal will hold about half an Inch when plained upon both sides.

320. One of your Deal-boards must be slit into three: These being thinner than the rest, are to make Sliders for the Tops of the Boxes and Doors over the Glafs-windows: You must also have square Panes of Glafs, five Inches broad, and seven Inches long, Trunk-handles of Iron, long Bits of thin Iron, or Tin five Inches long, and an Inch broad, some small Hinges, Nails, and Sprigs.

321. Then let the Workman form a Mould, that he may make the Boxes the better, and exactly of a Bigness, to fit one another when they come to be used: The Bench ought to be very smooth, exactly even, and well plained; for if it is uneven, so will the Bottom of the Boxes, and consequently be unfit for the Floor of the Bee-house; and whereas the Form of the Box should be Eight square, so must the Mould.

322. Upon the Bench, the Carpenter should mark out, with his Rule and Compasses, an Eight square of eighteen Inches Diameter, which is the Breadth of the Box: Then he should fit small Bits of Deal for a Mould within the Place marked out: These Bits which need not be above half an Inch broad, being nailed down to the Bench in an Octagonal Form of seventeen Inches Diameter, the Box which is made on the Out-side of this Mould, will be eighteen Inches, or a little more, according as the Board the Box is made of is in Thickness.

323. Here take Notice, that this Mould is not to be taken from the Bench, till as many Boxes are made as are designed; for you'll find by Experience, that when they are all of one Bigness, and fit one another exactly, they will be used with much less Trouble, than when they are otherwise made, either thro' Ignorance or Carelessness.

324. The Mould being made, take one of the thickest Deals; cut it into Lengths of eighteen Inches, and glue two and two together, to make the Tops of the Boxes, which must be eighteen Inches over; so having glued as many of these two Breadths together, as you design to make Boxes, then proceed to plane your Boards well on both Sides; and thereafter to saw out the Scantlings of the Boxes, which must be seven Inches and a Quarter in the widest Part, and six Inches and three Quarters in that Part that is to be the Inside of the Box, the Edges being thus smoothed off with a Plane.

325. Set these Scantlings thus prepared upright, and stay them down to the Bench and Mould with Sprigs, and so you will find that Eight of these Pieces of Wood, will come round the Mould, tho' every Box must have but Six of them, because the Squares before and behind must not be of these Boards, but framed with two Rabbits: One Inside Rabbet, to receive the Glass in the Inside of the Box, seven Inches long, and five Inches deep; and another Rabbet on the Outside above the Glass, to receive a thin Door, which must be made to shut over the Glass-window, and hung to the Frame by small Hinges, and must also be planed very thin; for the whole Frame containing the Glass, and this little Door, must be no thicker than one of the other Boards, and used as one of them in both the fore and back Part of the Box.

326. That you may conveniently open the Door when you incline to see what your Bees are a doing, and shut it again when you have done, a small Button of Wood to turn upon a Nail, should be therewith fastened to the Side of it.

327. Now, when you have fixed these two Frames with Glass-windows, one before and another behind, fitted the six Pieces to them, and with Sprigs fastened them together, then fit the Head, which must not be nailed on the Top of these Pieces, but cut exactly, and

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with

with great Care let down within them, and then all the Pieces being well sprigged to this Head, the Box is made, but not quite finished.

328. Four Things remain still to be done before 'tis compleated. A Hole is to be made in the Top of the Box with a Slider over it, and a little Slider under the Front-door; the Handles are to be put on, and two Sticks placed within the Box across for supporting the Combs.

329. As to the Hole in the Middle of the Top, it should be five Inches square, and half an Inch on each Side of the Hole must be cut in Grooves for a Slider to run in, that when 'tis once fastened in, it shall not rise to come out, but only slide to and fro in order to stop, or leave open the Hole of five Inches square, as Occasion requires; for when the Box is to be the uppermost one, then the Slider must be thrust home to shut the Hole; but then the middle or under Box must have this Hole open, the Shutter being drawn back, this Hole serving for a Communication betwixt Box and Box. To this End pare away with a Chizel a Place for the Slider, which must be at least half an Inch wider than the Hole, and run in a Groove, made hollow on Purpose for shutting the Hole, or drawing back.

330. This Cutting on the Top of the Box must be as deep as your Slider is thick; but the best Way is not to have the Hinder-part of this Shutter of the whole Breadth of the other End, but cut to two Inches, which is sufficient for driving it home, when you want to cut off the upper Box of Honey, and more convenient, than if it was left to the whole Breadth, and it must be so ordered in the making this Slider, that when it is brought quite back, this narrow End may be even with the Outside of the Box; and two little Bits must be nailed, after the Shutter is made and put into its Grooves, on each Side of the narrow End of it, to fill up what is cut away therefrom, which will hinder it from falling out, and prevent the Bees from coming out at either Side.

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The Slider should be shaved away to a narrow Edge in the broad cutting End, and then have a thin Bit of Tin or Iron nailed on it; when, tho' it be not very sharp, it will cut the Honey and Wax that is in the Hole.

331. The next Thing is a Slider in the Edge of the Box under the Front-window. That Square of the Box, where the narrow End of the broad Slider before spoken of is, must always be the Hinder-part, and this narrow End must always come over the Back-window; so under the contrary Window, which is the Front-window, there must be a Passage cut about half an Inch in Height, and four or five Inches in Length, and you must make a little Slider to stop this Hole also, when there is Occasion, or as much of it as you think fit.

332. This little Slider must be cut with slopping Edges, and the Box where it is to go must be hollowed; so that when 'tis thrust home, as 'tis always when a Box is raised, it may stop the Hole close, and also be entirely of the Box, and not fall out. This Slider must be about seven Inches long, so as to come about two Inches without the Box, with a Notch cut near the utter End, to pull it out by when 'tis too far in, or to draw it out to its full Length, if there be Occasion, without disturbing the Bees.

333. Now, put the Iron-handles on the two Sides of the Box, that you may lift it conveniently, either when you stand before or behind it: Take Care that they be clinched fast in the Inside. 'Tis best to put them in the Middle, neither near the Top nor Bottom.

334. In the Months of *June, July, and August*, when the Colonies, by Reason of their continual Breeding, come to be very full, if the Weather is very hot and showery, the Bees, by natural Instinct, sensible of their Danger, by being abroad in the Time of Rain, press home in such a violent Haste upon the least Appearance of it, that they sometimes stop the Passage so close, that those within are like to be suffocated for want of Air, which makes them so uneasy, that they are like mad Creatures within the Box.

335. To

335. To remedy this, cut a Hole two Inches square in the Back-part of it, about the Middle, and over this Hole in the Inside, nail a Piece of Tin-plate, punched full of Holes as large as you please, provided the Bees cannot creep out at them; then make a very thin Slider to run in Grooves over this Hole on the Outside, that when it is thrust home, all may be close and warm; and when there is Occasion in violent hot Weather, it may be drawn back, that the Air may freely pass thro' those Holes, and the Disorder aforesaid, as well as their Swarming be prevented, or, which will do as well.

336. Bore Holes with a Piercer as thick as you can, in the same Place for two Inches square, and put a Slider on the Outside over these Holes. The drawing back of this Slider to let in Air, is a probable Way to prevent Swarming, till by the increasing of their Numbers you are forced to raise the Colony upon another Box; the Manner how, and the Time when to do it, you shall find at large described in its proper Place.

337. The last Thing is to put two half Inch square Sticks, made out of your Deal, across in the Inside of the Box, and the one two Inches above the other; the lowest ought to be about two Inches from the Bottom, and both fastened at the Ends, by driving a Nail thro' from the Outside of the Box into each of the Ends, but not quite to the Head, that when you are going to take out your Honey, you may draw the Nails, and then the Sticks with the Honey will come easily out.

388. It may be observed on the foresaid Description of the Box. *1st*. That no one Thing directed can well be omitted. The Slider under the front Window is but a small Part; and perhaps you may think it can very well be wanted, but it serves when robbing Time comes, to straiten the Passage more or less as you please; yea, sometimes you will be forced to thrust it so far in, as only to leave Room for one Bee to go in or out at a Time, and when you raise one Box upon another, you must thrust it quite home. Then being held in a Groove, it cannot

not fall out, but makes that Part of the Box close and intire, and so one Box being raised upon another, the Bees must work in and out thro' the Hole of the lowest.

339. *2dly.* If the Handles were not strong and well fastened, and should fail lifting up a Box or sometimes two, which may be the Weight of one hundred Pounds, lying upon the Handles, the Fall might prove the Destruction of the Colony.

340. *3dly.* As to the Sticks, they are needful for supporting the Combs with the Honey, as I have said, and 'tis better that they go thro' the Box in the Form of the Letter X than exactly across. The Doors for the Glass-windows are necessary for keeping out the Light from the Bees, for if they had it always upon them, it would much disturb them.

341. *4thly.* There are two other Instruments, which a Bee-master in the Colony Way cannot want; they are a light wooden Mallet and a thin Piece of Wood, rather thinner than the broad Slider on the Top of the Box, about nine Inches long, and of the same Breadth of the narrow End of the great Slider.

342. These two Instruments are for taking one Box from off another, by setting the End of this thin Bit of Board against the narrow End of the Slider of the lower Box, and with the Mallet driving it, until the Combs in the Hole in the Top of the Box be cut through, that the upper Box may be taken away as shall be directed.

343. For furnishing your House with Bees, buy Hives, and bring them home about *October*, by the Rules herein before offered; after they have been one Night with you, about Six o'Clock next Morning, set all your Hives with their Mouths against the Holes made on Purpose in the Ledge under the Bee-house Door, and then with Lime and Hair smooth up all within the House, so that no Bees may get out of the Hives any where but thro' the Holes in the Ledge, and then generally you have little more to do till *April* or *May* next.

244. *October* is reckoned a better Time for purchasing than *May*, yet if you have the Opportunity of good Swarms

Swarms near you, you should not neglect it, but then you must bring them home the same Day they swarm, and put the Hives with their Mouths against the Holes in the Ledge as aforesaid.

345. Tho' you furnish your House with Swarms in *May*, yet that will not more forward the working down of the Bees into the Boxes, than if you bought Hives in *October*, for those will be fit to be raised upon the Boxes in the Spring following, and the Swarms will be no more. But,

346. If you incline to buy Swarms, you must, as I have said, bring them home the very Day they are swarmed; for if you should let them stand two or three Days, and the Weather prove good, they may make Combs to hold Honey to drown themselves, because the Virgin Honey is fine and thin, and the Combs being then tender and the Weather warm, they are apt to break down in the Carriage.

347. The Cloths the Hives are tied in when brought home, should be large and thin, because if they were thick, such as Diaper or Damask when new, they would be too close for the Bees to breath thro', and being so, tho' they might not be suffocated, would make them very angry and troublesome in the putting into the House; and large they must be, otherways they would not tie over the Hives.

348. If the Spring be early, the breeding of the Bees will be forward: You must therefore observe them in the End of *April* and in *May*, but must not raise them upon your Box, till they begin to ly out with a Tendency to swarming, then and no sooner are they to be raised, and you are to proceed thus.

349. Having your Box ready with the Top-Slider quite open, that the Bees may pass from the Hive down into the Box, and the Slider in the Mouth of it drawn back, that they may have Room enough to work in and out, then open both the fore and back Door of that Part of the House where the Bees are to be raised; when cause some Body stand ready with the Box, holding it by the
two

two Iron Handles at the Front of the House, and the fore Slider or Mouth of the Box to him ward.

350. This done, go you behind the House, and gently lift up the Hive so high, that the Box may go under it, then cause him with the Box in his Hand, set it with its Mouth close to the Hole of the Ledge so often spoken of; which being carefully done, set down the Hive as exactly upon the Middle of the Box as you can guess, then stop the Mouth of the Hive with Lime and Hair presently, so the Bees will immediately work down thro' the Hole in the Top of the Box, and in and out at the Hole in the Ledge they were used to before; without any Hinderance.

351. If you should raise the Hive on the Box before they want it, you would greatly hinder their Work, by their being obliged to carry it thro' an empty Box to the Hive, which they had not filled, and if you should not presently stop the Mouth of the Hive, the Bees would still hang about it, and not go down into the Box, but the Mouth of the Hive being closed up, they go immediately downward, having no other Passage except into the Box, and the Mouth of it serves for the same Purpose that the Mouth of the Hive did.

352. By the Use of the Glass-windows, you will know better, when to raise the first Box and Hive upon the second Box, then you could understand when to raise the Hive.

353. When the Bees have so wrought in the Box, that the Combs come to the Window of it, and it seems very full of Bees as well as Combs, then is the Time to raise it on another, especially if you see them seal up their Honey in the Combs half Way down the first Box, which you will also easily do by looking in at the Windows.

354. Then place some Body before that Part of the Bee-house, with a Box ready in his Hand, the broad Top-Slider being drawn quite back that the Hole may be fully open, and the Slider in the Mouth or under Part of the Front of the Box being drawn so far back, as to leave

leave a sufficient Passage into it, which being done, take hold of the Handles of the first Box, lift up it and the Hive above it together, and set the second Box under them, which in a good Summer, you will sometimes have Occasion to do by the Middle of *June*.

355. Thrust home the Shutter of the first Box immediately, that no Bees may come out there, but work in and out thro' the second, and be very observant that the Mouth of the Box be not only exactly opposite to the Hole in the Ledge, but that the Box be set so close to it, that the Bees cannot creep between the one and the other.

356. If the Boxes when set upon one another as directed, do not go so close together, but that there be Room for the Bees to come out betwixt the Joinings into the House, then you must take a Knife and fill up the Chinks with Lime and Hair, and if they can get out betwixt the Box and the Floor, you must do the same. So now having a compleat Colony of two Boxes and an Hive, you have nothing to do till you take off the Hive.

357. When by the Glass-windows you perceive that the middle Box is well filled, then to take off the Hive proceed thus. Fix a Napkin by one End, with small Nails or Pins on the Landing-board, where the Bees pitch before they go in. It should be close up to the Hole, but not to stop it, lest the Bees be disturbed and their Work hindered.

358. In this Operation you have Occasion to open only one of the Backdoors of the Bee-house, and then if the Top-Slider of the uppermost Box will not by thrusting it with your Hand, make its Way, cut the Combs, and cover the Hole, (which being the quietest Way will give least Disturbance to the Bees) you must take the thin Piece of Board and Mallet before spoken of, go behind the Colony, and setting the Board against the narrow End of the Top-Slider of the upper Box, with the Mallet drive it home till it cut the Combs that are in the Hole, which must be thus performed.

359. Hold the thin Board in your Left-hand, and with the Mallet in the Right, give it two or three Strokes till

till it is home, all the while pressing the Board, with your Left-hand, hard against the End of the Slider, and carrying your Hand even, that when you drive it with the Mallet, it may not slip over or under, but keep directly against it till it is quite thro'.

360. Then take hold of the Hive, which, being cut from the Box, will with little Force come up from it; and as you take it up, twist it a little round, so it will the easier part from the Box: Next, carry it away twenty or thirty Yards from the Bees, if your Garden will admit of it, that you may be easy and quiet while performing the rest, for the Smell of the fresh Honey in the Hive you have taken off, might draw the other Hives about you.

361. Now, place your Hive with the small End downward in a Pail, Peck, or Flower-Pot; so the small End going into any of these Vessels, it will stand firm; thereafter take an empty Hive, and place it on the Top of your Hive with Honey, Mouth to Mouth, then take a large Cloth, and tie them round at the Joining, that no Bees may get out.

362. This being done, strike pretty hard with a Stick, to shake the Bees that are within; beat sometimes on one Side, then on the other, and so all round, letting them stand a little, now and then, without striking, that the Bees crawling up may have Time to go into the empty Hive; then beat again, all the while holding your Hand on the empty Hive, to keep it in its Place, otherwise it might fall off by the shaking of the other.

363. When you have done so more than a Quarter of an Hour, being always cautious lest you beat the upper Hive, which would make those fall that were ascended, let them stand still a little, and then taking the top Hive in your Hand, which now hath all the Bees that were in the other Hive, carry them away to the Napkin, and laying a Stick on that Part of it, which lieth on the Ground, with one smart Stroke of the Hive on the Stick you will shake out all the Bees, where they will fly a little, and then crawling up the Napkin go home

to their Fellows, who will gladly receive them, as their Acclamations, which those who are used to them, very well know, sufficiently testify; so you have the Honey and they undisturbed keep to their Labours, ignorant of the Trick you have plaid them.

364. On this Occasion you will sometimes see the King on the Napkin, and you'll be highly diverted, observing him with great Majesty, marching up upon it with his Subjects, and into the Hole of the Ledge which leads into the undermost Box. But you should never venture to take off an Hive or upper Box, unless you have good Reason to be persuaded that there is a Sufficiency of Honey in the middle One, to maintain so great a Stock of Bees thro' the Winter, lest you lose the whole Colony, by the Want of what you have taken away.

365. These Directions concerning the taking off the Straw-hive, will in a great Measure teach you, how and when to take off the upper Box the next Year after it is gone. So I shall not say much upon this Head, only you should set the upper Box on the Ledges of a Joint-stool, turned upside down, and instead of a Straw-hive to set upon the Straw-hive, you must now place an empty Box on the full one, and knock as before directed, on the Edge round the Top, which will be undermost next the Joint-stool, so the Bees will ascend into the empty Box, and must be knocked out on the Napkin as before.

366. When you strike the Box on the Stick that lies on the Napkin, in order to return the Bees to their Fellows, you must take Care that you don't turn those Squares where the Glass-windows are over the Stick, lest the Stroke might endanger the breaking of the Glasses.

367. If you keep no Bees in Straw-hives to get Swarms from, and have a mind to have one early in the Spring, then be sure to take off the under Box in *September*, when it seldom hath Honey, and set the upper one down to the Floor. This is done by driving home the Cutter of the under Box, standing behind the Bee-house, and lifting up the second Box by the Handles

two

two or three Inches, and then causing a Servant, standing before the House, take the under one quite away. Then set down that in your own Hand, and draw back the Door-slider under the front Window, that the Bees may have Room to go in and out thro' that Passage.

368. And whereas some of them will be about the Combs in the Box taken away, knock them out or disturb them, and they'll fly home. So your Colony being thus reduced to one Box, you'll not miss to get a large and early Swarm, when the Spring comes, if you don't raise them upon another Box. Which Swarm you may keep as well in a Box as a Straw-Hive, and set it down in your Bee-house with the Mouth-shutter drawn back, and the Top-slider shut up, the Mouth of the Box being close to the Hole of the Ledge as before, so you may have a Swarm out of a Box as soon or sooner, than you could out of a Straw-hive: For a Way to cause them swarm is to straiten them of Room, and to hinder them is to give them more of it, as has been said, both which may be easily done in Boxes.

369. In these Descriptions and Directions concerning the Husbandry of Bees in the Colony-way, and without killing them, I have had my Eye chiefly on what Dr. WARDER has said thereupon, which I was the more disposed to do; because a learned curious and ingenious Gentleman, who assisted me when I revised this Performance, says, "That in this Way of Colonies, and by following the *Doctor's* Directions, he has practised the Bee-husbandry, both in Timber Boxes and Straw-hives, betwixt thirty and forty Years, so successively, that he is resolved he will never alter his Method." But I think 'tis just to mention, that I found he had so great an Aversion to the killing of Bees, that I believe he would not do it, tho' he was sure to make more Profit.

370. He says further, "That he has often had in his Way upwards of fifty *Scots* Pints of Honey in a Year, besides the candied which he made into Mead; and that he has several Times of late Years had Virgin-honey, by placing an empty Box or Hive on the
" Top

“ Top of a lower one, into which the Bees went up
 “ and filled it with Combs and Honey ; ” which is
 contrary to Mr. WARDER'S Opinion ; for he says ex-
 pressly, *That these Industrious Servants of ours, tho' they
 may be helped in their working, by supplying them with
 Room ; yet they must not be contradicted in the Nature of
 their working, which is always to work downward, and
 not upward.* The Gentleman who, as I told you, has
 had thirty or forty Years Experience of this Way of do-
 ing, says, “ That the same lower Box or Hive should
 “ not be kept above two or three Years together, lest
 “ the Combs, growing old, become too thick by the
 “ young Brood's leaving a Skin therein, which you may
 “ remember was observed in another Case.”

371. I have seen his Straw-hives in the Colony-way.
 They are round, as wide at the Top as at the Bottom,
 have four Pieces of Timber planed, not quite so thick as
 a square Inch, of Length exactly equal to the Height of
 the Hive, are fixed thereto at equal Distances from one
 another, and they have Cross-sticks betwixt each two
 of them, as in the Timber-boxes described.

372. These four Pieces of Timber are necessary, be-
 cause the Straw-hive would not without them be able to
 support the Weight it gets to bear ; and because, by
 the Means of Handles fixed into them thro' the Hive,
 it can be lifted, as Occasion requires.

373. Each Hive has likewise, in the Back side of it,
 a Glass-window with a Timber-shutter neatly sewed in
 with a Pack-thread ; the Head is of Timber with a
 square Hole in it, as in the Timber-boxes described :
 He says, “ These Straw-hives may be used in the Co-
 “ lony-way without a House, tho' the Timber Boxes
 “ cannot for the Reasons formerly given.”

374. I shall next offer you in Mr. *Thorley's* own
 Words, what he calls *His new easy and effectual Method,*
to preserve Bees not only in Colonies, but common Hives,
from that cruel Death to which their ignorant, injurious
and most ungrateful Owners, says he, so commonly condemn
them ; a Secret unknown to past Ages, and now published for
 the

the Benefit of Mankind. You see he is vain of his Secret.

375. "The Preservation and Improvement of Bees in Colonies, has been no Secret since Mr. *Geddie's* happy Invention, and how effectually to promote the said Ends in the Way of common Hives, is the kind Design of this Chapter.

376. "From the long Conversation I have had with these very wonderful Creatures, their inimitable Excellencies, and many commendable Qualities, together with their great Usefulness to Mankind, I am become one of their greatest Admirers, and a Publick, may I prove a prevailing and successful Advocate for them, most solemnly protesting against all that notorious Unjustice, and inexcusable Ingratitude of their cruel, and merciless Owners, who not content with all their Treasure, collected with infinite Pains and many Perils, devote them to Destruction without any Distinction, or the least Pity and Compassion!

377. "Not unlike so many bloody Ruffians and Murderers, who not satisfied to rob others of their Substance, do sacrifice their Lives, their dearest Possession, for which they are the just Abhorrence of Mankind: A righteous Man regards the Life of his Beast, and is no Regard due to these Creatures of GOD, which are so excellent in themselves and serviceable to Men? Was *Balaam* rebuked only for beating his Ass? What Censure do these deserve who thus destroy such Multitudes of innocent useful Creatures, and most faithful Servants? Are they Righteous who are thus cruel and barbarous? Or do they act consistently with their own or the publick Interest?

378. "When therefore the following Pages will make it appear, with how little Trouble and without any Expence, the Owners may come at their Riches with Safety to their Lives, those who shall hereafter doom them to the common Death, must be altogether without Excuse.

379. "The Method I have pursued with so great Success for many Years, and now recommend to the Publick, as most effectual for preserving Bees in common Hives, is Incorporation, or uniting two Stocks into one, by the Help of a peculiar Fume or Opiat, which for a Time, will put them entirely in your Power to divide and dispose of at your Pleasure; yet know, that Dominion over them will be but of a short Duration, therefore you must be expeditious in the Operation.

380. But, before you enter upon Action, and that you may proceed prudently with Safety and Success, it will be necessary to premise and observe as follows, viz. You must know the Queen, or commanding Bee perfectly well, which you are immediately to search for among the Multitude, to apprehend and imprison, returning her no more to her beloved and most loyal Subjects: Search for her among the Bees which you destroy by Brimstone, whereby you may learn to know her.

381. "No new Swarms or Stocks should be thus united, except very late ones, and Casts which have not gained a sufficient Quantity of Honey for their Winter Store; such I always unite to save their Lives: Hives, or Stocks, which have swarmed once or twice, consequently reduced in their Numbers, are the fittest to be joined together, which will greatly strengthen and improve them.

382. "Nevertheless, if you have a Stock both rich in Honey and full of Bees, which you are desirous to take, it is but dividing the Bees into two Parts, and putting them into two other Hives instead of one.

383. "I must add one Precaution more under this Head, *i. e.* Examine first that Stock to which you design to join the Bees of another, whether there is Honey enough in it to maintain the Bees of both: It should be full twenty Pounds in Weight, the heavier the better.

384. "The

384. " The Way thus prepared, I must now lead
 " my Readers into an intricate Path, to which I
 " take it for granted, they are perfect Strangers. And
 " tho' it hath many Windings and Meanders in it, yet
 " having travelled it myself so often, and with so much
 " Safety and Advantage, I doubt not but to conduct o-
 " thers thro' it to their Satisfaction : Provided they di-
 " ligently observe the following Directions.

385. " I am first to inform them what the Materials
 " are, and after that the Manner of Operation.

386. " The narcotick or stupifying Potion is only the
 " Fume of the *Fungus Maximus*, or larger Mushroom,
 " commonly called by the Name *Bunt*, *Puckfist*, or
 " *Frogcheese* : It is as large or larger than a Man's
 " Head. I had one of these brought me the last Sum-
 " mer, unripe and white, which weighted some Pounds,
 " but when ripe, of a brown Colour, and turning to
 " Powder, they are exceeding light.

387. " Shepherds and Herdsmen, &c. frequently find
 " them in the Fields, and will supply you with them
 " towards the latter End of the Season.

388. " When you have procured one of these Pucks,
 " put it into a large Paper, pressing it down therein to
 " two Thirds or near half the Bulk, tying it up very
 " close, put it in an Oven sometime after the Household-
 " Bread is drawn, letting it continue all Night ; when
 " it will hold Fire, it is fit for your Use, in the Method
 " following.

389. " With a Pair of Cisars, cut a Piece of the
 " Puck as large as an Hen's Egg, (better at first to have
 " too much than too little) and fix it to the End of a
 " small Stick slit for that Purpose, and sharpened at the
 " the other End, which place so, that it may hang near
 " the Middle of an empty Hive : This Hive you must
 " set with the Mouth upwards, near the Stock you in-
 " tend to take, in a Pail or Bucket : This done, set
 " fire to the Puck with a Candle, and immediately place
 " the Stock of Bees over it, tying a Cloth round the
 " Hives, which you must have in Readiness, that no
 " Smoke

“ Smoke may come forth : In a Minute’s Time, or little more, will you, with Delight, hear them drop like Hail into the empty Hive. When the major Part of them are down, and you hear very few fall, you may beat the Top of the Hive gently with your Hand, to get as many out as you can : Then closing the Cloth, lift it off to a Table or broad Board prepared on Purpose ; and knocking the Hive against it several Times, many more will tumble out, perhaps the Queen among them, as I have often found her lodging near the Crown, she often falls one of the last.

390. “ If she is not there, then search for her among the main Body in the empty Hive, putting them forth upon the Table : If you discover her not before.

391. “ During this Search, you must proceed after the same Manner with the other Hive, with which these are to be united. No sooner are these Bees composed and quiet, and you have found and secured the Queen, but you must put the Bees of both Hives in one, mingling them thoroughly together, and sprinkling them at the same Time with a little Ale and Sugar, putting them among the Combs of the later Hive, and shake them down in it. When they are all in, cover it with a Cloth, bound close about it, and let them stand all that Night and the next Day shut up, that a Bee may not get out ; sometime after, you will be sensible they are awaked out of Sleep. The same Night would be best to put them in their proper Place, and if you had another Garden wherein to fix them, I would choose it myself, and recommend it to others.

392. “ The second Night after the Union, in the Dusk of the Evening, move the Cloth from the Mouth, taking Care of yourself, and they will with a great Noise immediately fall forth, but being too late to take Wing will go in again : Then putting in two Pieces of Tobacco Pipes to let in Air, stop them close in together as before, and keep them so for three or

“ four

four Days longer, after which you may leave the Door continually open.

394. " But in getting away the Cloth, you must use Discretion and Caution, since they will for some Time resent the Affront and offensive Treatment.

395. " The best Time of the Year for Union is after the young Brood is all out, and before they begin to lodge in the empty Cells, which they do in great Numbers in cold Weather, and the Winter Time, tho' Mr. *Rusden* denies it.

396. " As to the Hour of the Day, I would advise young Practitioners to do it early in the Afternoon, that having the greater Light, they may the better find out the Queen. The few Bees left in the Hive suffocate with Sulphur. I never knew such combined Stocks conquered by Robbers, and they will either swarm the next Summer, or yield you an Hive full of Honey. A little Practice will make you perfect, and one View of such an Operation, would form a more perfect Idea of the whole Transaction, than what the ablest Pen possibly can." So far Mr. *Thorley*.

397. I now proceed to the Account given by the Author of the Natural History aforementioned, concerning the Manner of taking the Honey and Wax out of the Hives without destroying the Bees.

398. "*Clar*. Our last Conversation put me in Mind of a Reflexion I have often revolved, *viz.* That there are few Creatures upon Earth, but have their Antagonists among other Species of Animals; and that Man is the general Opponent of them all. He looks upon himself as their King, and accordingly uses a tyrannick Sway over them. He imagines that the whole Earth, with all the Things contained therein, was made for his Use only; that he has an uncontrollable Right of Life and Death over all Things who breathe. Methinks 'tis whimsical enough, that Man, when he eats his Ox or Sheep, should imagine he possesses himself of a Thing to which he had a just and lawful Title.

399. " *Eugen.* The Lion may, with equal Justice, fancy himself empowered to feed upon Man, and the Wolf on Sheep. But 'tis my Opinion, that 'tis neither the one nor the other could find any other original Title of their Sovereignty, than Force or Cunning. But let us engage no farther in a Question, as this would raise up a Multitude of Gainfayers, whose Interest it would be to differ from us in Opinion. I shall only observe, that, if our Ancestors were Usurpers of the Empire, they obtained over Brutes; long Possession has given us a Sort of Title to this Sovereignty: But yet this will not permit us to exercise such a Power any otherways than with Oeconomy, Prudence, Temperance and Discretion. Besides the Right we claim over their Persons, we have others, (and these seem better founded) on the Things belonging to them. Some Creatures have such a Superfluity as would be utterly lost; wherefore then should we not take Advantage of it? This seconding the Views of Nature, who seems to offer them us. Hens lay a greater Number of Eggs than are necessary for the Propagation of their Species. Cows give Milk with such a Profusion, as plainly shews that all was not destined as Sustenance for their Calves. Sheep let us shear their Wooll, which afterwards grows again. Bees have the Art of renewing their Wax, whenever they are dispossessed of it. Let us therefore divide those several Things with them, but then let us imitate on these Occasions, good Kings, who exact no more Contributions from their Subjects, than what may enable such Monarchs to compensate for these by administering Justice to their Subjects, by indulging them Protection and procuring them Plenty. We behave thus towards such Creatures as are kept in our Yards; Why then should Bees only find the Effects of our Cruelty? We destroy every Year, in several Provinces of the Kingdom, and especially about *Paris*, a great Number of Hives, and this merely for Destruction Sake. In the Places I am

" speaking

speaking of, a Custom equally ridiculous and cruel prevails. The Persons hinted at, employ no other Method in order to get the Honey and Wax out of the Hive, than to kill all the Bees who inhabit it. For this Purpose they make a Hole in the Ground large enough to receive the Bottom of the Hive. In the Bottom of the Hole, Raggs smeared with Brimstone and set on Fire are thrown. The Hive is set on the Vapour, when immediately so much Earth is drawn round it as may suffice to prevent the Bees, and even the Smoke from getting away. The Stench of the Brimstone with which the Hive is instantly filled, soon stifles all the ill-fated Bees. There are other Kinds of Death, the Invention whereof various Authors thought meritorious; but which I think is a Merit to conceal. In the Places where this Practice equally unskilful and barbarous is used, People apologize for themselves by declaring, that they destroy on these Occasions none but old Bees, from whom no farther Harvest can be expected; Bees who would furnish no more Swarms, but would eat during the Winter-Season, a considerable Quantity of the Honey stored up by them. In this Manner would a Tyrant argue, who, after he had cut to Pieces all the Inhabitants of one of the Cities, merely for the Sake of Plundering their Gold and Silver, should endeavour to justify his monstrous Cruelty, by declaring, that all the Inhabitants were very ancient, and incapable of furnishing Posterity next Year.

400. "*Clar.* This is a perfect Picture of the Avarice with which Man is fired. All his Arguments, as well as his Conduct, are big with Horror. Whenever I see Injustice and Cruelty go Hand in Hand, I conclude from thence, that they are led on by Avarice, and I am seldom or never mistaken in my Conjectures.

401. "*Eugen.* Your Reflexion, *Clarissa*, is exceedingly just. Who told the Persons hinted at as above, that all the Bees in an Hive are old. We ourselves
" have

" have seen when a Swarm was issuing forth, that it
 " consisted of old and young Bees; and that many of
 " both Sorts remained in the abandoned Hive. When
 " the *Goths* and *Saxons* sent Colonies into *Gaul*, did they
 " leave in their own Country none except old Men
 " who were unable to get Successors? Hives recruit
 " themselves perpetually like Cities and Governments.
 " Tho' the Bees of an Hive happen to be destroyed by
 " some Accident, yet many exist eight or ten Years.
 " I know a Peasant who preserved an Hive above 30 Years.
 " The Murderers abovementioned add, that Bees would
 " devour during Winter all the Honey stored up by
 " them. But this is another Argument dictated by A-
 " varice, which ever mistakes its true Interest. It
 " must be confessed, that our Insects would eat the great-
 " est Part of such Honey, and perhaps all; since they
 " hoard it up merely as Provision for themselves. But
 " does it not argue more Wisdom in us, to be contented
 " with taking away a Portion at different Times, and in
 " various Seasons of the same Year, as is the Practice
 " in many Countries, than to carry off the Whole at
 " once? By what Name would you call a Peasant, who
 " would kill his Goat, merely that he might at once
 " take all the Milk contained in the Bladders of that
 " Animal?

402. "*Clar.* How delighted am I to hear you con-
 " found Covetousness, and undertake the Defence of In-
 " nocence, in Opposition to Oppression and Tyranny?
 " Would I could enact Laws, a dreadful Proclamation
 " should then be published against Bee-side.

403. "*Eugen.* There is really such an one. *Alexander*
 " *de Montfort*, whom I before mentioned, cites a Law,
 " enacted by a grand Duke of *Tuscany*, forbidding all
 " Persons to put Bees to Death upon Pain of being pu-
 " nished arbitrarily.

404. "*Clar.* Delightful Prince! How justly did he
 " deserve to command over others? Why was not this
 " laudable Example imitated by all the Monarchs upon
 " Earth? Myself will make such an Injunction, and
 " cause

“ cause it to be published throughout the whole Extent
 “ of my little Territories.

405. “ *Eugen.* This will be well, but then you at
 “ the same Time must restore another Practice, I mean
 “ the gentler Method of taking away the Wax and Ho-
 “ ney.

406. “ *Clar.* 'Tis from you that I expect to be taught.
 “ this.

407. *Eugen.* “ When a Person has used his utmost En-
 “ deavours to preserve Bees, and to multiply and pro-
 “ duce large Harvests from them, such an one may just-
 “ ly expect to share the Fruits of their Labours with
 “ these Insects, I say, divide it with them, and not seize
 “ upon the whole, and butcher them at the same Time.
 “ This sharing or dividing with the Bees is performed
 “ by only cutting of some Proportion from every Hive:
 “ such is the Custom in several Countries where they
 “ are cut in different Seasons. In some this is done at
 “ the End of *February*, or in the Month of *March*;
 “ we then may without injuring the Bees, take away a
 “ considerable Quantity of their Wax, and at the same
 “ Time of the Honey remaining of their Winter-ward.
 “ There needs no more be left them than what may be
 “ necessary for Support, during the inclement Days be-
 “ tween the End of Winter and *May*, we may also take
 “ out severals of their Combs, which are empty of Ho-
 “ ney, particularly those, the Wax whereof is grown
 “ too black. What is thus taken away from Bees at a
 “ Time, when they have an Opportunity of recruiting
 “ it soon, is a Superfluity which so far from injuring,
 “ gives them more Room, and an Opportunity of mak-
 “ ing new Work. However, as the Time for this O-
 “ peration differs in many Places, it must vary accord-
 “ ing to the different Provinces or Countries, and ac-
 “ cording to the more or less Clemency of the Seasons.
 “ Our Harvests are not all gathered in the same Month.
 “ In Proportion as the Flowers spring forth, or are kept
 “ back, the Labours of the Bees are either forwarded

“ or

“ or retarded. In some Provinces the Honey-combs
 “ are not cut till *July* or *August*.

408. *Clar.* “ This Article, of cutting the Honey-
 “ combs, seems to be a very bold Attempt. D’ye
 “ know, *Eugenio*, that, ever since I have kept Bees,
 “ I never had the Courage to be present on such Oc-
 “ casions ?

409. *Eugen.* “ D’ye think you’ll dare to listen to the
 “ Description of it ? ’Tis a Military Expedition, and
 “ one of the boldest, to carry off, from the Inside of an
 “ Hive, Honey-combs which Thousands of Bees, strong-
 “ ly armed, are always prepared to defend. And, in-
 “ deed, he who engages in this Interprize, should be
 “ armed *Cap-a-pee*. He must use the same Precaution
 “ observed by your Gardiner, when he took a Swarm
 “ from a Tree, in order to remove it into an Hive, I
 “ mean, that he must well cover his Face, his Hands
 “ and Legs, nevertheless some *Peasants*, as I observed
 “ before, use none of these Precautions. With regard
 “ to the Time of Day fit for this Operation, some con-
 “ clude Noon to be the best ; from a Supposition that
 “ the greatest Part of the Bees are then in the Field.
 “ However, I would not advise any Person to trust to
 “ this. About Twelve at Noon, during the hot Days,
 “ the least Work is done by the Bees ; and consequent-
 “ ly most of these Insects are then in the Hives. In
 “ case the Noon of temperate Days is chosen, the more
 “ Bees there are abroad, the greater Number will be re-
 “ turning home every Instant. All these little Inhabi-
 “ tants, exasperated to find, at their Return, their City
 “ demolished, and their Possessions plundered, will hast-
 “ en to Vengeance, and the enraged Squadron will not
 “ give Quarter to the common Enemy : Others are of
 “ Opinion, which is also mine, That the best Time is,
 “ the Morning, as our Insects are then still pinched by
 “ the Cold of the preceding Night. To quiet the
 “ Bees the more, and make them less furious, the
 “ smoking them will render these Insects yet more
 “ senseless : To effect this, the Hive must be lifted up

2 little, when the Smoke of a Rag, held in ones Hand, being introduced ; this makes the Bees giddy, and forces them to move towards the Summit of the Honey-combs. We then seize the Instant, and turning the Hive Side-ways, laying it on a Chair, or Bench, of such a Height, as may facilitate the intended Operation. And now, a single Glance directed to the Hive, shews, at once, what Combs are fit for cutting. Then with a Knife, whose Blade bends like that used for cutting Vines, we pare away whatever may be thought proper. The Survey of such Combs as are full of Honey, and those which are very old, determine the Operation where to cut, and either to take whole Combs away, or only Parts. In a Word, 'tis allowed to be just in some Measure, and even necessary, to leave the Bees about Half their Honey. 'Tis proper to keep the Rag burning during the whole Operation, and to let its Smoke descend in the Hive, in order to keep the Bees in.

410. *Clar.* " All these Precautions are extremely seasonable ; but do not the Persons, who thus take away Honey and Wax, run the Hazard of carrying off and destroying, at the same Time, a great Number of little Worms, or Maggots, which might soon have turned to Bees.

411. *Eugen.* " Your Observation is quite right, this being an Error which many, thro' Carelessness, often commit. However, a little Experience in Honey-combs, in distinguishing those whose Cells are shut, and, among these, the being able to discern such as are Store-houses of Honey, from those which contain *Nymphæ*, will prevent our committing any Mistakes on this Occasion. By first breaking off a little Piece from the Honey-comb, and examining its Cells, we easily discover whether any Worms, *Nymphæ* and Eggs, are inclosed in them, in which Case we must not touch them. Some Authors advise us, to cut such Combs only as are towards the Back of the Hive ; but this Rule is too general. The best is, to pitch upon

“ upon such Combs as are fullest of Honey, After having taken what we think proper from an Hive, we then set it in its Place again. That Side, whence the largest Quantities have been taken, ought to be set forward; *that is*, to be most exposed to the Sun; the Bees chusing rather to work on this Side. Some Persons have thought upon an Expedient on these Occasions; and which is judged by them as a *Medium*, between the Desire of taking the Produce of a whole Hive, and the Cruelty of putting all its Inhabitants to Death. The Expedient I here mean is, The removing the Bees of a full Hive into an empty one. However, this Practice is not convenient except in the Spring, and during Seasons when the Fields may abundantly furnish Bees wherewithal to repair, with Speed, the Losses they thus sustain. Nevertheless by this Practice, the Eggs are destroyed, which is always a considerable Loss, and consequently should be prevented as much as possible. I know but one Case in which this is absolutely requisite, and that is, When the false Moths are multiplied to such a Degree in the Hive, that the safest Course the Bees can take, is to abandon it to them.”

412. Now you have Mr. *Geddie's*, the French Author's, Mr. *Thorley's*, and the more common Method of coming at the Honey and Wax, consider well, weigh Circumstances carefully, and chuse which of them you will. I wish you Success.

413. Before I conclude, I shall offer two Receipts for making Mead, take also which ever of them you think best. The first by Mr. *Thorley* is,

414. How to make Mead not inferior to the best of foreign Wines.

415. Put three Pounds of the finest Honey to one Gallon of Water, two Lemon-pills to each Gallon; Boil it half an Hour, well scummed, then put in while boiling Lemon-pill; work it with Yeast, then put it in your Vessel, with the Pill, to stand five or six Months, and bottle it off for your Use.

416. N. B. If

416. *N. B.* If you chuse to keep it several Years, put four Pounds to a Gallon.

417. The second by Dr. WARDER, tho' I have not kept strictly to his Words, is, how to make *English* Canary no way inferior to the best of *Spanish* Wines :

418. One hundred and twenty Pounds will make a Barrel of very good Mead ; but if you make it of clear Honey ; your best Way is to allow four Pounds to every Gallon of Water ; mix the Honey and Water in a Copper, then boil it an Hour, and scum it well ; which Scum strain thro' *Hippocrates's Sleeve*, or a taper'd Bag made of Swan-skin, (fine thick Flannel) with a Hoop at the wide End, letting the narrow End come to a Point. This Bag will make it as fine as the other. When your Mead is almost cold, tun it up, clay it down, and let it stand till it is fine and old enough to drink, which will be sooner or later, according to the Season of the Year in which it is made, and the Weather that comes thereafter. This Liquor is one of the choicest and most wholesome Wines in the World, and exceeding fit to be made use of in Possets and as Canary. Thus used, 'tis impossible to know whether the Posset was made of Mead or Canary.

419. If you make Mead of the washing of Combs, or of Honey from the Combs ; then you must dissolve it in warm Water, till an Egg will swim in it the Breadth of a Shilling. In this Case you must be careful that, before you break your Combs into the Sieve or Strainer, you separate all the young Bees, which you may easily know from the Honey, as also, the Sandrach or Bee-bread, which is a yellow Substance, with which some of the Cells will be full. These would give your Mead an ill Taste. Then proceed to boil, scum, and tun as before directed. It is best to keep the Mead till it is a Year old. If it is made, as advised, and of clear Honey, it will keep as long as you please. I have some of it almost nine Years old, says Mr. WARDER.

420. You see the *Doctor* has given his Opinion, that this is one of the choicest and most wholesome Wines in the

World. Yea, who doubts, but the Products of a Country where Men are born and bred up, are more friendly to their Constitutions, than those of Outlandish Soils in distant Climates. Yet, so vitiated and corrupted are our Tastes, so inordinate our Desires for foreign Liquors, and so infatuated are we, as, acting contrary to our true Interest, and even common Sense, to relish no Liquors, but such as bring Diseases and Poverty on us together.

421. What can be more unreasonable than to bring Brandy, made of liquified Tartar, (the Lees or Dregs of Wine) from *France*; poisonous Gin, with which Rum is commonly mixt before it comes to our Hands, from *London*; and Wine, often adulterated, from several remote Countries? I say, what can be more contrary to the Dictates of Reason, than to bring Home *French* Wine and Brandy, (which can only be purchased with Cash, and which Occasion innumerable Perjuries, which draw down the Wrath and heavy Judgments of the Almighty upon the Land) when we can have pure and good Liquors, natural to our Constitutions, made of our Honey, our own Grain, and other Products of our own Soil.

422. Is any foreign Wine often refined with poisonous or bad Things, tho' it were got in Exchange for our Manufactures, pleasanter or better than *British* Canary, (Mead) made of pure Honey? Let such as have not drunk more foreign Wine than Mead determine this Question, their Taste being unvitiated: Or, is the first so wholesome as the last? How many lamentable Deaths, occasioned by drinking of foreign Wines and Spirits, have happened to the Knowledge of every one of us? What Numbers of foreign Wines and Brandy Drinkers do we see daily tortured with the Gout, and other violent and inveterate Distempers?

423. Are Possets, which we generally like well when made of foreign Wine with the additional Expence of Sugar, so good and wholesome as such made of Mead which needs no Sweetening? I have heard the Doctors say, That Colds are the Inlets to, and lay the Foundation of Consumptions, and most of the Diseases we are
ubect

Subject to. Honey Drinks and Mead Poffets are, I'm informed, sovereign Remedies for these Distempers.

424. Surely we are a deluded People! we destroy both our Persons and our Purfes to please our vitiated Palates; and we are like to continue wilfully blind to our own Interest, until we are in a State of Misery irretrievable. Nothing, which I can see, can keep us from it, but Manufactures carried on, immediately and vigourously, upon Husbandry, which is their only sure Foundation. This is indeed a certain Way to prevent it, but let us not forget, let the Impression be strongly fixt, that this is the only Way.

425. Unless our Fishery was like to do well, I ask every Man what can prevent our Ruin, but Husbandry and Manufactures encouraged by Home Consumpt? Yea, the Consumpt of every Family in the Kingdom will be found necessary, and the Demands of every Family should, no doubt, be restricted, to such Articles as our Husbandry and Manufactures produce. Could this be brought about, we should yet become a rich and a happy People. Our contrary Behaviour shews, that we are infatuated, and galloping along the high Road to Destruction.

426. I have heard it said, That the Quakers have a Law or Maxim among them, to buy only from one another, but to sell to all the World. Well would it be for us, if every *Scotsman* was of the Principle just mentioned, with respect to the Products of our own Soil, and the Manufactures of our own Country.

427. Would the Great and the Rich lead the Way, and persevere, lower Ranks would follow. Nothing seems plainer than that the Calamities of a Nation, tho' they fall most sensibly on the poorer Sort, ly nevertheless heaviest upon Men of Estates at last; they having most to lose. The Tenant's Loss is really the Landlord's.

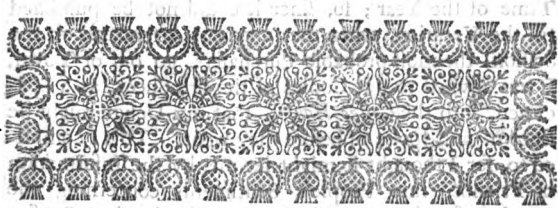
428. Let Landlords only remember, that the Value of their Estates depends absolutely on the Condition and Circumstances of the Tenants. If this certain Truth
was

was but confirmed in their Minds, then they would easily find out how deeply they are concerned in this Matter, and how much it is their Interest to encourage and promote Husbandry and Manufactures, not only by Home Consumpt, but by every possible Way: And I think I may observe that many of them would stay more at Home for that Purpose.

429. A Child touched by a single Spark, will dread the Fire and keep off it; but the Nation, it appears, ruined by oreign Commodities, will not abstain from them, and even those who have no reasonable Call to go abroad, will not stay at Home and spend their Money, when staying at Home and abstaining from foreign Commodities would make the Kingdom rich and happy; and when the Products of the Land and our Manufactures are indisputeably good, and may well serve the greatest. I leave it to every Reader to make his own Reflexion upon this. If I made one, I might probably disoblige many.

430. How many have died chearfully and gloriously for the Sake of their Country? Will we continue to gratify our vitiated Tastes, and foolish Fancies to the Ruin of ours? Will any *Scotsman* have the Assurance to call himself a *Patriot*, who, having no necessary Cause for living out of the Kingdom, drains it of its Coin, by spending his Rents abroad, or who by the use of foreign Commodities, undermines our Husbandry and Manufactures? These who encourage and support them, and some such even of the greatest Distinction we have, thereby prove themselves to be *Patriots* indeed, and they have the best and a just Title to the glorious Epithet. May the Number of such encrease daily: May they be always favoured and employed by the Crown, as they will be the Darlings of the People: When Death shall deprive us of the Blessing of any of them, may their Places be filled with Men as like them as possible, and may the Merit of the Dead be always faithfully recorded in History, that Honour and Praise may be paid to their Memories by all succeeding Generations.

APPEN-



APPENDIX.



Purposed to have ended my Book as in the preceding Page, yet I am excited to offer this Addition. I find my Performance gives not universal Content; I'm sorry for it: But how could I expect it would since no Book ever did, or I believe ever will? For who

can be so exact as not to fail sometimes? And even when there is no Failing, there's no escaping the Censure of bad Judges, of whom there are many. I have somewhere read,

*All human Race would fain be Wits,
But Millions miss for one that hits.*

Now, since an Opportunity offers, the printing of my Book being not quite finished, I shall first tell you how I came so early to the Knowledge of the Exception, next what it is. Then I shall venture to say a little for myself; and, last of all, submit to every candid Reader if the Censure is not unreasonable.

My

My Performance was not ready for the Press till near the End of *February*, when the Printers are more hurried, by Business of the Court of Session, than at any other Time of the Year; so, since it could not be published till the Vacation, when the numerous Attendants on the Session, the most probable Purchasers, go out of Town, I was advised to put Copies of the first Sheet, as a Specimen, into the *Coffee-Houses*, that my Design might be known, and spoke of before they went. This I complied to, for I thought it might let me, by the Information of Friends, into People's Sentiments concerning the Work before it was finished: Some for the same Reason had Access to the other Sheets as they were cast off, and thus I have in Part gained my End. For,

One of a Company at a *Coffee-House* Table, lifting up the first Sheet, said, "Have ye read that Gentlemen?" "Yes, *said one*, I have, and I wish the Stock may answer the Sample. I have read, *said he who opened the Discourse*, three Sheets of four of it, which a Friend put into my Hand, and I tired. The Book might, I doubt, not be useful, but, alas! the Style is so poor, mean and low, that 'tis apt to put one asleep, 'tis all lifeless Matter, it has no Embellishments, nothing entertaining and enlivening; Who will spend their Time upon such a heavy Piece, that has read the Natural History of the Bees, Nature displayed, or any Thing sprightly wrote on that curious and fruitful Subject? Not the young and lively: None, I dare say, but dull unfashionable People, or old out of the World Folks.

"Why, *replied the other*, was not the Honey tongued *Virgil* the first in your List? But pray explain yourself, Do you censure, or do you praise? If the old, experienced, and wise read the Book, will it not be because they find in it profitable Instructions in plain easy Language, without Excursions into extravagant Narratives, which divert the Mind of the Reader from Attention to the useful Parts? If I may be allowed to offer my Opinion, it is, that I find out the

" Author's

“ Author’s Sentiments easily. What other Manner of
 “ Expression do we want, in a Book wrote for Instruction
 “ not for Amusement? I suppose he meant not to write
 “ a Novel.”

Novel, No! I believe he did not, *answered the Objector, with a Sneer*, and then lifting the Paper read from it. *In the Natural History mentioned, a Dialogue betwixt Eugenio and Clarissa; Eugenio, says he, opened the sovereign Bee anatomically, and assisted Clarissa by his Glass, to see that she the sovereign Bee is the fruitful Mother, that the Drones are the Males, and that the working Bees are of no Sex: Dr. WARDER, says they are Females: What shall we believe?* “ So, continued he, he
 “ leaves the Matter, and is not this fillily told? More,
 “ said he, I add not at the Time, but only this: The
 “ Difference betwixt Things are best known by Comparison: Read the Natural History upon the very Occasion, there you’ll observe how beautifully and how
 “ naturally the Author makes his *Eugenio* and *Clarissa*
 “ express themselves, and then I submit the Matter to
 “ yourself. All fair, said the other, and so can I to
 “ you, but here we have very proper Judges.”

This Controversy, which shews that, as I have said; there is no pleasing every Body, has disposed me, since others may be of the same Opinion with the *Objector*, to insert the Conversation which he praises so much, that such as like it may find it here, and that every Reader may judge, whether I did right to take the Way I have taken, or would have done better if I had followed his Example.

Eugen. “ The remaining Question is to know how
 “ this Queen behaves to become a Mother? How she
 “ acts with her Hundreds of Husbands? How she conducts in her numerous *Seraglio*?

Clar. “ I impatiently expect the Particulars; I imagine the gallant *Anecdotes* of the Mother Bee would
 “ make a very entertaining History. Having examined, as you have done these with so penetrating an
 “ Eye,

“ Eye, I make no Doubt you have surprized the Queen
“ throwing her Handkerchief.”

Here I pass over betwixt three and four Leaves, and you may guess I have Reason, when *Clarissa* was brought to tell *Eugenio*, *You are lucky that I'm not disposed to quarrel, I know as much of this Article as I am desirous of knowing.* But I hope I may be excused for inserting that very Part, which the Gentleman made Use of; for 'tis natural for every Man to defend, and to pass a right Judgment, you must have his Evidence as well as mine before you.

Clar. “ Now open the Body of a working Bee, that I
“ may have no Doubt of the different Species.

Eugen. “ Here is one. You see here the Canal for Ali-
“ ments; a first Stomach which contains the Honey;
“ a second Stomach and the Intestines filled with Crude-
“ Wax: But beyond this, you observe no Part analo-
“ gous to the *Ovaria*, nor any Thing that resembles, or
“ that one can even suspect to be Eggs: Moreover you
“ see no Part which has the Appearance of being that of
“ the Males or Drones.

Clar. “ That is true, I shall however raise one Ob-
“ jection. How are you sure that there is in one Hive
“ one only Female; that what you call Drones are all
“ Males; and that the working Bees are without Ex-
“ ception of heither Sex: To conclude, that the Bees
“ are all each in their Kind, such as you have opened?
“ It appears to me very difficult to verify this exactly.

Eugen. “ The Certainty of it is very simple and easy.
“ You have only to devote, as I have done, an entire
“ Hive, to destroy all its People, either by Smoke or Water,
“ and then to examine every particular Bee: It is not e-
“ ven necessary to open them, it will suffice to press
“ them between your two Fingers: One can easily
“ make the characteristick Parts of the Sex appear in
“ those which have any; and the Default of that Ap-
“ pearance will indicate those which have none.

Clar.

Clar. " What Possibility is there of resisting so great an Evidence? After what I have seen there is no Room for Dispute, one must surrender.

Eugen. " To take Advantage of the good Disposition you are in, I pass to the Recital of the Mother Bee's Amours. A Mother Bee, who is the only one of her Sex found in the Hive, as she is at certain Times found there with seven or eight Hundred, and sometimes a thousand Drones, seems to be there in the Midst of a very numerous *Seraglio* of Males. They have however pretended, that she admits none of them to any Intimacies with her. It is true, that hitherto no Person has seen her seek their Union, or, at least, no Person has writ that he has seen it. But this is one of those Cases, wherein a negative Proof cannot have much Force: For without ascribing Modesty to this Bee, there is no Reason to imagine that she quites the interior Part of the Hive, where she likes to pass her Time, and that she endeavours to expose herself to the Spectators Eyes, when she would permit a Male to render her fruitful. The Queen of *Achem* is in the same Case with the Queen of the Bees, that is, to have a *Seraglio* of Men at her Command. If then one of those Travellers, who traverse the World to instruct themselves in the Manners and Customs of different People, should keep himself in the Suburbs of the City of *Achem*, in hopes that the Queen will come to seek him in the Fields, with some one of her Favourites, to make him a Spectator of what Secrets pass between them, he would probably wait a great While to no Purpose: And if he should take it in his Head to conclude, that Men attend this Queen like small *Bologna* Dogs, only for the Pleasure of being looked at, I fancy he would not find many Readers so simple, as to believe his Relation. Let us make the same Inference with respect to the Bees. We have it not in our Power to be Witnesses of all their Actions. Our Eyes are not formed to see through their waxen Combs, covered with several Layers of common Bees.

Q

But

“ But we are certain, it is behind these Combs, that the
 “ Mystery of Fecundation is carried on. Being thus instruct-
 “ ed of the Place where the Operation is performed, no-
 “ thing remains but to know the Time and Manner. The
 “ Time is easy to be known. At the Beginning of the
 “ Spring, open an Hive, you will not find one single
 “ Male: From the Middle of *May* to the End of *June*
 “ you will find Hundreds of them: From thence to the
 “ following Spring you look for them in vain: The
 “ Time therefore of Fecundation can be no other than
 “ when there are Males, that is, about six Weeks tak-
 “ en in the Months of *May* and *June*. With regard
 “ to the Manner how Things pass to cause this Fecun-
 “ dation, 'tis what I myself have seen, and of which I
 “ will give you an exact Account. I found the Secret
 “ to force a Mother Bee to act before me, in the same
 “ Manner she does in the Bottom of her Hive.

Clar. “ Hold *Eugenio*, your Virtuosi may have the
 “ Liberty of seeing what is improper for the Ladies to
 “ hear.

Eugen. “ There are Ways of Talking to the Under-
 “ standing without shocking the Ears; these Ways I in-
 “ tend to make Use of. Towards the Beginning of *May*, I
 “ took a Mother, who had already given Birth to a great
 “ Number of Bees, and who was willing to give it to
 “ several more. I put her into one of these Glasses
 “ which we use for Powder, where I shut her up with
 “ seven or eight Males. I was curious to observe how
 “ they would behave with her, or she with them. They
 “ were taken from the same Hives, and were some of
 “ her Husbands. They treated her, however, with an
 “ Indifference I did not expect. Near upon two Hours
 “ I left them together, in which nothing passed between
 “ them. Each continued on its Side in a perfect Inac-
 “ tion, as People who would never be acquainted.

Clar. “ It seems as if this Experiment is not much to
 “ the Advantage of what you would persuade me to.

Eugen. “ When one makes Experiments of this Na-
 “ ture, it is equally advantageous, to know what makes
 “ them

them fail, as what succeed. This last did not succeed, for the following Reasons. In order to get this Queen Bee, I had plunged the whole Hive into Water, and, by this Means, had taken out the Queen almost drowned. Returned therefore in so small a Time, from the Gates of Death, it is not at all to be wondered at, that she had not those Passions, which are the Effects of full and perfect Health. Besides, she was in the Middle of her Laying-time, when all Animals of both Sexes have no mutual Desires. Add to this, she was not a young Mother; the Condition of her Wings proved her Age, as ours is known by the Wrinkles on our Fore-heads: Her Wings were notched, and the Edges of them shivered away. The Observations I was desirous of making Demanded, therefore, that I should shut up with some Males a Female, which, as yet, had no Communication, or very little, with them. Towards the Middle of *June* they brought me one, which I had Reason to believe was such as I wanted. She had been found, that Morning, near an Hive, which had swarmed the Night before. For, as I already told you, there are sometimes supernumerary Queens amongst the Swarms; This, I speak of, was one of the Swarm, who, 'tis likely, had saved her Life by Flight. The good Condition of her Wings, and her Colour, made me conclude, that she was yet young; and the Bulk of her Body, not so great as that of a Female ready to lay, seemed to prove, that she had no other Eggs, but such as were extremely small. I shut her up in the Glass, where I put likewise a Male with her, which I had ordered to be taken from one of my old Hives. I discovered the Character of this young Queen, as soon as she had been put to the Proof. I had never seen any but Queens, accustomed to be treated, every Instant, by the working Bees, to receive from them Presents of Honey, Thousands of Carresses, and a Thousand little Marks of Esteem, of every Kind. Thus I saw, with some Surprize, that

all

“ all the Deference, which common Bees have for the
 “ Mother, the same this young Queen had for the
 “ Drone I had put to her. Not satisfied to come near
 “ him, she delayed not to put out her Trunk, some-
 “ times successively to lick different Parts of the Male’s
 “ Body, at other Times to offer him Honey : she turn-
 “ ed round about him, continually carressing him, either
 “ with her Trunk or Legs. The Drone stupidly submit-
 “ ted to so many Endearments, as if they had been his
 “ Due, nor seemed at all moved by them. It seemed as
 “ if it had been Goodness in him to suffer himself to be
 “ carressed: However, at the End of a Quarter of an Hour,
 “ he seemed to be a little animated; and when the Fe-
 “ male, placed in Sight, full over against him, had
 “ brushed, with her Thighs, the Head of this Insen-
 “ sible; and had softly set at Play her *Antennæ*; the
 “ Male was determined, at length, to answer her Ad-
 “ vances, by simular ones, of the same Nature. The
 “ Female redoubled her Vivacity, and placed herself in
 “ those Positions, which agree not very well with the
 “ Idea which has been attempted to be given us of her
 “ Modesty; It is to make use of a weak Term, to stile
 “ these Positions only immodest; they approached to
 “ something superior, unknown to us: A Superiority,
 “ which overthrows the general Order of Nature, by
 “ subjecting the more noble Species to the other. All
 “ these Endearments were by no Means unuseful to this
 “ passionate Queen; her indolent Spouse became more
 “ active; he was animated more and more. One might
 “ see, as I did distinctly, that many of those Organs,
 “ which you observed within him, when I opened
 “ the Male, appeared without him. The whole Trans-
 “ action continued three or four Hours, during which
 “ he found Time for Repose, and repeated Acts of
 “ Love. At length the Drone fell into one, which
 “ to the Queen seemed to be of too long a Duration.
 “ She was desirous to draw him from his Lethargy;
 “ she seized him, with her Teeth, by the Corcelet;
 “ she cheer’d him a little; sometimes, in order to re-
 “ fresh him more, she put her Head under his Body;

“ but

“ but so many Marks of her repeated Regard, were un-
 “ useful, he was dead.

Clar. “ How! what do you say?

Eugen. “ I say he was dead, nor is he the only one
 “ I have seen expire in these critical Moments. I fancy
 “ so immediate a Death in such Circumstances may ap-
 “ pear to you suspicious, or, at least, an extraordinary
 “ Event, but the Consequences were so. When I
 “ knew this little Animal was absolutely deprived of
 “ Life, I only thought of consoling the Widow, and I
 “ fancied I could no better succeed in this, than to pre-
 “ sent her another Spouse young and vigorous.

Clar. “ That is to say, that you reasoned on Account
 “ of this Bee, agreeably to the malicious Principles,
 “ which Men are possess of with regard to our Sex.
 “ Could a Philosopher of your Cast have any Taint of
 “ vulgar Prejudices?

Eugen. “ Grant me more Justice. I thought of no
 “ Inference injurious to the Ladies; I was only desirous
 “ to treat this Bee like a Brute; but, to my great Asto-
 “ nishment, she behaved like a virtuous Wife. The
 “ Living did not at all console her for the Dead. She
 “ remained all the rest of the Day fixed to the Body of
 “ her unfortunate Spouse, continued the same Cares,
 “ and loaded him with the same Carresses, which she had
 “ conferred during Life. The Widow of *Mausolus*
 “ could not better discharge her Duty.

Clar. “ You begin to interest me for this tender Queen.
 “ I am curious to know her Destiny.

Eugen. “ You shall soon be satisfied; Night being
 “ come, I drew from the Glass the two Spouses, the
 “ Living and the Dead, and shut up in their Room an
 “ hundred common Bees, to keep our Queen warm,
 “ during the Night. The next Morning, I presented
 “ her with a new Husband. I bestowed likewise an-
 “ other on another Queen, which they had brought me
 “ to repeat the Experiment. The two Females behav-
 “ ed in the same Manner, in which the first had done,
 “ the Day before, with a Male in perfect Health.

Clar.

Clar. " This spoils all. Was then one Night sufficient to cause our *Artemisia* forget her *Mausolus* ?

Eugen. " What is approved among us, let us not charge as a Crime to her. We find nothing blameable, that a young Widow should admit new Engagements, after her Year of Widowhood. One Night with a Bee may be equivalent to one of our Years. Time ought to be measured, according to the Duration of Life. An Animal which has but three or four Years to live, cannot admit so long Interval between two Actions as that which has sixty or seventy. Besides, from all you have seen, and from all I have told you, we have a Right to conclude that, in the Hive a Mother Bee acts as that did in the Glass; and, consequently, that Bees are produced like other Animals, and not from Corruption.

Clar. " That appears to me extremely true. But I think it no less strange, that this Queen should gratify the Desires of her Sex; in a Manner so opposite to natural Order.

Eugen. " This inversion of Nature ought not to surprise you; it is even necessary in this Case: For when it has been once established, that a Female should cohabite with a thousand Males, the Consequence ought to be, that these Males should be sleepy, and to be awakened only by her; that she should be free to chuse among them all him, whom she would honour with her Favours. You'll easily conceive what Confusion, what a terrible Situation it would be for a Woman, to find herself in the Midst, and at the Mercy of a Crowd of active, petulant Husbands, who would all be Masters the same Moment.

Clar. " You are in the Right; that is easily admitted. The Imagination requires no Assistance, to present to itself a just Image of the Disorders which would result from thence.

Eugen. " You now know, *Clarissa*, how the Mother Bee becomes fruitful; you know what puts her in a State to people the World with so numerous a Posterity.

“ rity. We shall see the next Time we meet here,
 “ how she acquits herself of this important and labori-
 “ ous Office.”

All I shall say for myself is this: You'll have observed I had only said, that the Author of the *Natural History* had maintained, *That the Working-bees are of no Sex: Dr. WARDER says they are Females: What shall we believe?* Is not this plain, discreet, and modest Language? Have I not, in the Manner of Expression, hit upon the Socratic Way of Reasoning? *Socrates* always inquired, always interrogated, says Mr. *Charpentier* and *Byshe*, in their Accounts of the Life of that great Man; and if you look into the Works of *Plato* and *Xenophon*, you'll likewise observe, that they tell you, it was, his, their Master's Way. But now, as you see what the *Natural History* says, and as Mr. *WARDER* uses these Words; *After great Pains taken, and curious Observations made, with the Help of the best Glasses, I must come to this certain Conclusion, that all the Working-bees are Females;* I do say positively, that such Glasses, or such Accounts, are not to be believed; for the Assertions of both these Gentlemen cannot be true, and, I think, I may say, That the *Doctor's* Account of the Working-Bees appears least fabulous, and has least of the Air of a Romance.

The Author of the *Natural History* has, I think; himself yielded in the Introduction to his Book, that it is such, or was intended to be such. He makes *Clarissa* say, *I want nothing of you but a Romance, but the true Romance of the History of Bees;* and *Eugenio* to answer, *I will endeavour to satisfy you, I will relate nothing but what has been carefully observed, and well attested: There will enter a good Deal of the Marvelous into my Recital, but nothing of the False.* Did you ever read a Romance, wherein the Author did not endeavour to persuade you, that he wrote nothing but the Truth? And the more romantic his Performance was, did he not take the more Pains to convince, that his Relations were true? but further,

I leave

I leave it to you, my Reader, to determine, if such a luscious Dialogue as this betwixt *Eugenio* and *Clarissa*, painting such Images, and giving such a Tincture to the Imagination, tho' it may be thought genteely wrote, be worth the Value of its Dress. I apprehend the Author of it and I have proceeded on different Plans, and that this has occasioned the Difference in our Way of Writing.

His Design seems to have been, chiefly, to entertain his Readers with eloquent Expressions, to swell his Book: For what other Reason, to give only another Instance or two out of many, would he have filled up six or seven Pages, with the Description of the Eyes of Bees and other Flies; and telling how many Thousands each Fly hath? The Butter-Fly no less than 34650, and, if I take up his Meaning, each Bee as many; I say, for what other Reason would he have, in another Place, employed five or six Pages more, acquainting us of three Sorts of nameless Flies, *The first, whereof, says he, lays its Eggs in the Brains of a Sheep, in spite of the snuffing and the perpetual Agitation of the Beast in question, by finding an Opportunity of gliding into its Nostrils, where she gets to the sinus frontalis. The second, in the Throat of Stags, by piercing at once, and without Hesitation, thro' the most pitchy Gloom, and shaping her Way through all the winding Passages, leading from the Entrance of the Nose to the Root of the Tongue. And the Third, in a Mares anus, by getting under the Tail and gliding till she reach it: Here he is very particular. Probably, says he, the Insect at first excited only an itching, which prompted the Mare to force outward the Border or Edge of its Intestine; to open it, and widen its Aperture. Our Fly made a proper Advantage of this Disposition, she advancing further and concealing herself in the Foldings of the Anus. It was then in all Probability, that she finished her Operation and was enabled to lay her Eggs. Soon after this the Mare seemed quite distracted; she beginning to run, caper and prance, and at last threw herself on the Ground, and it was a quarter of an Hour, says he, before she was easy, and fell to feeding*

feeding again. Besides, he says, *That the Sustenance suitable to the young they are going to bring forth, is found only in the said Places.*

Is not this fine Language to *Clarissa*? But passing this Consideration, had he been a Disciple of the Philosopher, whom the Oracle pronounced the wisest of all Men, and God gave the *Athenians*, says *Plato*, to let them see their Faults, he would have taught him to have spent his Time on more useful Matters. *Xenophon* tells us, *That it was his Custom, speaking of Things natural, to ask, such as employed their Time upon Inquiries only curious, if they contented themselves with bare Knowledge without expecting any Profit? And that he, Socrates, employed his own Meditations on what was useful.* *M. Charpentier* and *Byshe* before mentioned say, *That he professed not a vain and useless Science, but rendered himself useful to his Friends and his Country; that he would have Men set Bounds to their Curiosities, and that this Doctrine was conformable to that of Solomon, the wise Man himself, who tells us, "God" has delivered up the World to the Disputations of Men, not being pleased that they should "know the Secrets of his Works."* *But that these useless Inquiries agree very well with the Vanity of those Authors, who being unable to attain to the Knowledge of the Object they proposed to themselves, adhered to all the idle Notions their Imaginations presented them, and gave us their foolish Conceits for Reasons.* Wherefore *Plutarch* says, *That Socrates having taken Philosophy out of the Hands of Pythagoras and Empedocles, who represented her full of Chimeras, Fables and Superstitions, and even playing the downright Fool, brought her to treat of Things with Prudence, and to search for Truth in solid and substantial Arguments; that he left the superfluous to take the necessary; and quitted the curious Philosophy to embrace one that was solid and useful.* The Author of the *Natural History's* Accounts of the Bee's Eyes, the Queen's Amours, the Flies, and many others in his Book, are, I humbly think, unuseful. What get we tho' they be

R

true?

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true? Do they contribute to make Honey more plentiful, or to enlarge the Commerce of Wax? But

My Purpose was only to instruct my Readers, by more and better practical Directions than any Writer on the Subject hath hitherto given, and, I hope, I have not only attained my End, but that my Language will be inoffensive to the nicer Ear, tho' I have adapted it to the meanest Capacity. I have studyed to use few Words, (for Brevity is the best Help to the Memory) and printed on a small Type, that my Book might be comprised in a few Sheets, and sold at a low Price; that so the Poor who cannot purchase, or the Unlearned who cannot be instructed by Books swelled with a Redundancy of elegant Expressions, may find mine cheap, plain and useful to direct them in every Difficulty that can occur: Which I flatter myself shall make this profitable Husbandry, in the Power of the meanest Cottager to practise, universal over the Kingdom.

F I N I S.



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T H E

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