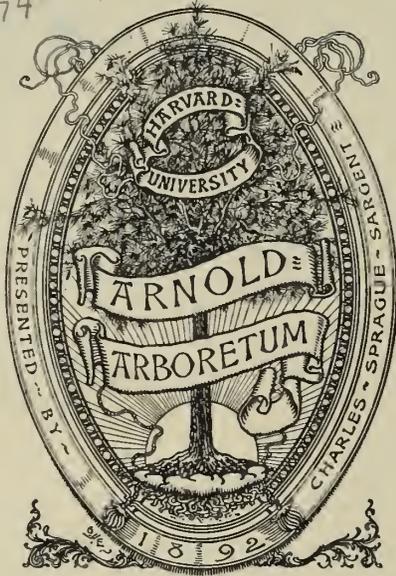




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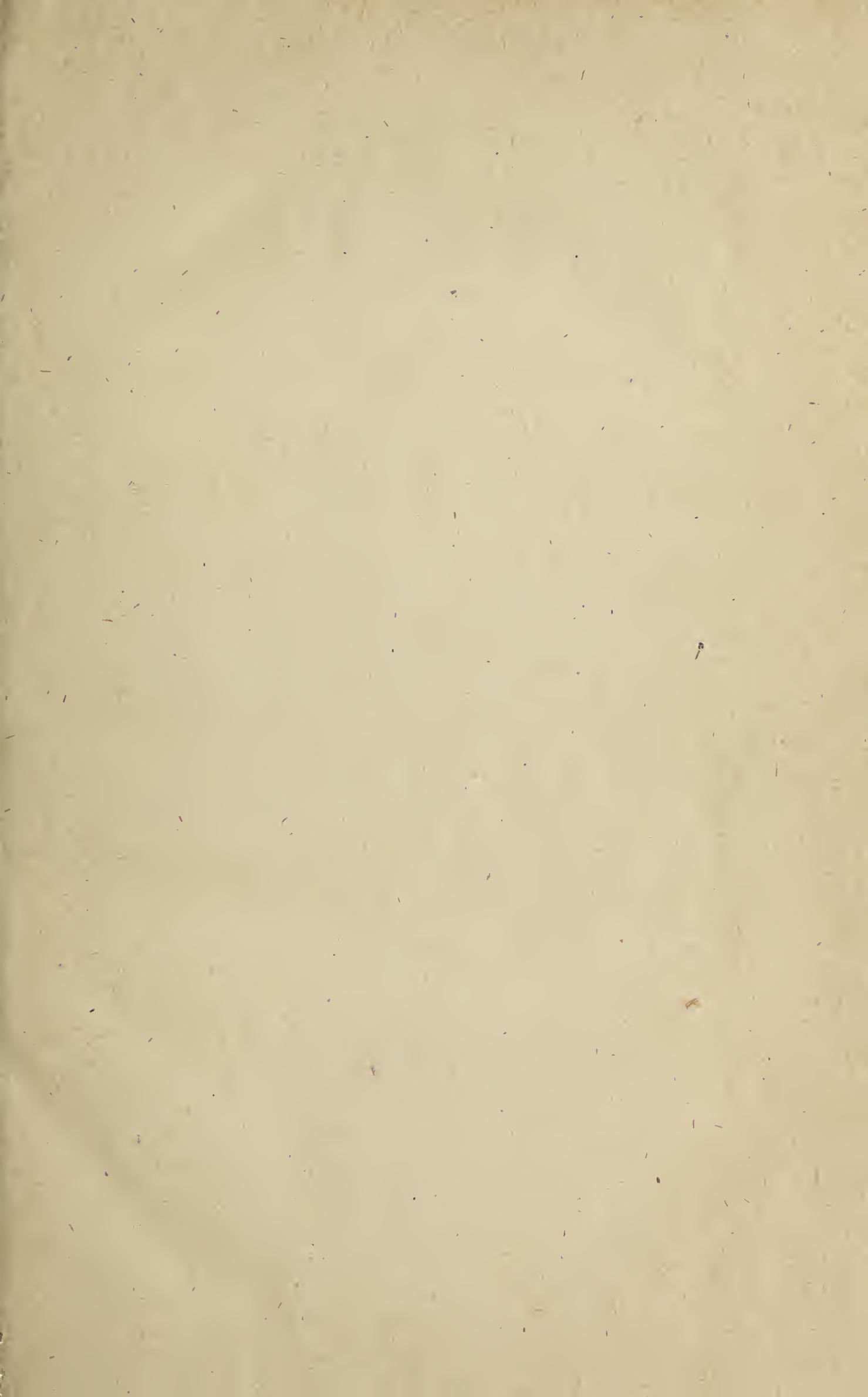
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Lilium Sarniense:

OR, A

DESCRIPTION

OF THE

GUERNSEY-LILLY.

To which is added

The Botanical Dissection

OF THE

COFFEE BERRY.

With FIGURES.

By Dr. JAMES DOUGLAS, Honorary Fellow of the ROYAL COLLEGE of PHYSICIANS, LONDON; and Fellow of the ROYAL SOCIETY.

LONDON:

Printed by G. STRAHAN, at the Golden Ball, over-
against the Royal Exchange, Cornhill. 1725.

THE

DESCRIPTION

OF

THE

OF

BY

1847



A Catalogue of the Authors that have described or mentioned the *Narcissus Japonicus*, or GUERNSAY LILLY.

JACOBUS CORNUTUS, *Pariensis Medicus.*

CAnadensium Plantarum, aliarumque nondum editarum Historia. Paris 1635. 4to. V. cap. 58. p. 157.

RENATUS RAPINUS, *Gallus, e Societate Jesu.*

Hortorum Libri quatuor, cum disputatione de cultura hortensi. Paris 1665. fol. V. lib. 1. p. 25.

JOHANNES REA, *Anglus.*

A compleat Florilege, furnished with all Requisites belonging to a Florist. In three Books. Lond. 1665. fol. V. Lib. 1. cap. 10. p. 74.

DIONYSIUS JONCQUET, *Doct. Med. Paris. Reg. Ord. & Horti Regii Botanicus Professor.*

Hortus Regius. Paris 1666. f. V. p. 125.

JOHANNES EVELYN, *Anglus.*

Of Gardens. Four Books. First written in Latin Verse, by Renatus Rapin, and now made English. Lond. 1673. 8vo. V. p. 60.

ROBERTUS MORISONUS, *Scotus Abredonensis. Medicus & Professor Botanicus Regius, Hortique Botanici apud Oxonienses Præfatus.*

Plantarum historia Universalis Oxoniensis. Pars secunda. Oxonii 1680. fol. V. Sect. 4. p. 367. §. 33.

JOHANNES RAIUS, *Anglus. Soc. Reg. Socius.*

Historia Plantarum, species hactenus editas, aliasque insuper multas noviter inventas & descriptas complectens. 2 Vol. f. V. Tom. 2. Lond. 1688. Lib. 21. cap. 3: No. 9. p. 1142.

JOSEPHUS PITTON TOURNEFORT, *Aquisextiensis. Doctor Medicus Parisiensis, & in Horto Regio Botanices Professor.*

Institutiones Rei herbaria. Paris. 1700. 4to. V. Clas. 9. Sect. 5. p. 386.

JACOBUS GARDINER, *Anglus. A. M. Subdecanus Lincolnensis.*

RAPIN of Gardens. *A Latin Poem in four Books, English'd.* Lond. 1706. 8vo. V. Edit. 2. p. 54. & Indicem.

LUDOVICUS LIGER, *Gallus.*

The compleat Florist: Or, The Universal Culture of Flowers, &c. Translated from the French. Lond. 1706. 8vo. V. p. 359.

ENGELBERTUS KÆMPFERUS, *Westphalus. M. D.*

Amœnitatum Exoticarum Fasciculi quinque. Lemgovia 1712. 4to. V. Fas. 5. Clas. 4. p. 872.

RICHARDUS BRADLEY, *Anglus. Soc. Reg. Soc.*

New Improvements of Planting and Gardening, both Philosophical and Practical. In three Parts. Lond. 1718. 8vo. V. Part. 2. p. 123. §. 7.

HERMANNUS BOERHAAVE, *Batavus. Medicinæ, Chemicæ & Botanices Professor in Academiâ Lugduno-Batavâ.*

Index alter Plantarum quæ in Horto Academico Lugduno-Batavo aluntur. *Lugd. Bat.* 1720. 4to. V. Part 2. p. 147.



A LIST of the other Authors mention'd in
the following Treatise.

ANDREAS CÆSALPINUS, *Arctinus, Medi-*
cine Professor in Academia Pisana, deinde Summi
Pontificis Clementis Svi. Archiater.

De Plantis Libri sedecim ad Serenissimum Franciscum Medicum
Magnum Ætruriæ Ducem. *Florent. 1583. 4to. V. Lib. 1.*
cap. 7. p. 13.

CAROLUS CLUSIUS, *Atrebas. Imperatorum Maxi-*
milianii & Rudolphi ii. Aulæ quondam familiaris.

Rariorum Plantarum Historia. *Antw. 1601. fol. V. Lib. 2. Cap. 19.*
p. 167.

EMMANUEL SWEERTIUS, *Septimontius.*

Florilegium tractans de variis floribus & aliis Indicis Plantis. *Fran-*
cof. 1612. fol.

BASILIVS BESLERUS, *Noribergensis.*

Hortus Eystettensis. *Noriberg. 1613. f. 4 Vol.*

CRISPINUS PASSÆUS.

Hortus floridus in quo rariorum Plantarum icones ad vivam formam
delincatæ sunt. *Arnhemii 1614. 4to.*

JOHANNES BAUHINUS, *Basiliensis.*

Historia Plantarum Universalis. *Ebrod. 1651. f. 3 Vol.*

CASPARIUS BAUHINUS, *Basiliensis.*

Πλάξ Theatri Botanici. *Basilie* 1623. 4to.

TOBIAS ALDINUS, *Cesenas.*

Exactissima Descriptio Rariorum quarundam Plantarum quæ continentur Romæ in Horto Farnesiano. *Romæ* 1625. fol. V. cap. 7. p. 83.

JOHANNES PARKINSON, *Anglus.*

A Garden of all sorts of pleasant Flowers. Lond. 1629. fol.

JOHANNES BAPTISTA FERRARIUS, *Senensis.*
e Societate Jesu.

De Florum Cultura Libri quatuor. *Romæ* 1633. 4to. V. Lib. 2. Cap. 1. p. 115. 125.

HENRICUS VAN DRAKENSTEIN, *Sc.*

Hortus Malabaricus. *Amstelod.* 1678. fol.

DIONYSIUS JONCQUET.

Hortus. Sive Index Onomasticus Plantarum quas excolebat Parisiis Annis 1658. & 1659. *Paris.* 1659. 4to.

MARCELLUS MALPIGHIIUS, *Eximius Philosophus & Medicus Bononiensis. Soc. Reg. Soc.*

Anatome Plantarum. *Lond.* 1682. fol. V. p. 47. Tab. 29. Fig. 167.

JOHANNES COMMELINUS.

Horti Medici Amstelodamensis Rariorum Plantarum descriptio & Icones. *Amstel.* 1697. f.

JOHAN-

JOHANNES WOODWARD, *Anglus, M. D. Of the
College of Physicians and R. S. and Professor of Physick in
Gresham College.*

Some Thoughts and Experiments concerning Vegetation. V. Phil.
Transf. No. 253. Lond. 1699. 4to.

PATRICIUS BLAIR, *Scotus. M. D. & Soc. Reg. Soc.*

Botanick Essays, in two Parts. Lond. 1720. 8vo. V. Essay 4.
p. 282.

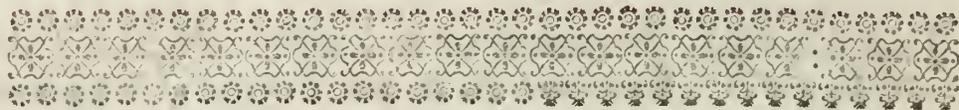
JULIUS PONTEDERA, *In Patavino Gymnasio Bo-
tanices Professor.*

Anthologia sive de Floris structura Libri tres. Patav. 1720. 4to.
V. lib. 1. cap. 2. p. 26. cap. 18. p. 39.

GULIELMUS CHAMBERS, *Anglus, M. D.*

Dissertatio Medica Inauguralis de Ribes Arabum & Ligno Rhodio.
Lug. Bat. 1724. 4to. V. cap. 5. p. 17.





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A ldinus (Tob.)	1625	Gardiner (Jac.)	1706
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Beslerus (Basil.)	1613	Liger (Ludov.)	1706
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INTRODUCTION.



IN a Country, to which the only true Method of enquiring into Nature is intirely owing, and where all the Parts of Natural Philosophy, as well as History, are daily receiving so considerable Improvements, in prosecution of that Method, not only by those whose Professions engage them in such Studies; but by great Numbers of others also, to whom a love of Knowledge, and a desire of admiring the Wisdom of the Almighty Creator, in the Works of Creation, are become as powerful Motives as either the Necessities of Life, or the Ties of Society can be: In such a Country, I say, there is no need of an Apology for what I now offer to the Publick. The Skill and Contrivance of Nature shine forth as brightly in the OEconomy of the Vegetable Kingdom, as in that of any other Part of her Works; and the Study of Plants, such especially as are remarkable for the beautiful Structure of their Flowers, was never more in vogue amongst us, than it seems to be at present.

THAT the *Guernsay Lilly* is of this Number, will, I believe, be disputed by none, who have ever beheld it in full Blossom; and I hope, the Description and Figures which I now give of it, will be sufficient to convince those who have never seen it.

It is now about fourscore and ten Years, since *Cornutus* publish'd the first Account that ever was given of this Plant, under the Name of *Narcissus Japonicus Flore Rutilo*. At least if any Author has described it before him, it is in so imperfect and indeterminate a Manner, that by what they have said, it cannot be certainly known whether they really meant our *Lilly* or not; as we shall see more particularly in its proper Place.

Cornutus's Design led him principally to the Consideration of such Plants, as are of the Growth of *Canada*, a *French* Settlement on the Continent of *North America*; but he has thought fit to include likewise in that History, such other Plants as had come to his Knowledge, which had not been taken notice of before him. Of these the *Narcissus Japonicus* is one. His Description of it is indeed ve-

ry far from being perfect, but that he really meant the same Plant with mine, is evident from every thing that he has said of it; which the Reader will find inserted in his own Words, under the several Heads of the following Account.

After *Cornutus*, the first Author by whom I find any mention made of this Flower, is our own Country Man *John Rea*, of *Kinlet*, near *Beudly* in *Worcestershire*. It is he who first called it the *Garnsay Lilly*, and indeed that is all he has said about it, which is worth observing: For after telling us “that the *Narcissus Virginianus Latifolius flore purpurascente* beareth many Flowers on one Stalk, like “small *Lillies*, of a sullen purplish Colour, never opening, and seldom shewing the inner Sides of the Leaves in its natural Country; “and he doubts will hardly live in ours: He adds, as it were only by “the by, that of this Generation is the *Narcissus* of *Japan* or *Garnsay Lilly*, which there prospers, and bears in *October* Peach colour’d Flowers; and that the *Indian Daffadils* are all strangers in *England*, “except that of *Garnsay*.

Whatever it was in *England* at the time this Author wrote, it is more than probable, it was as great a Stranger to him, as any of the rest: For had he ever seen it, it is impossible he should not have taken more notice of so essential a requisite belonging to a Florist, in a Book, which the Title would perswade us is furnished with them all.

About this same time, Father *Rapin*, a learned French Jesuite, in his Book of Gardens, designed, as his Society pretends, for a Supplement to *Virgils Georgicks*, put some part of *Cornutus's* Description into Latin Verse. Concerning this Author it is sufficient to observe, that as he has said nothing new concerning this Plant, so he is known to have been a much better Humanist than a Botanist. His Versification is allowed by every body to be very beautiful, and therefore I have thought it worth while to transcribe what relates to my *Lilly*, together with two *English* Translations of it; the first by Mr. *Evelyn*, the other by Mr. *Gardner*.

Mr. *Evelyn* has every where render'd the Sense of his Author exactly enough, but the Diction of Mr. *Gardner* is more refined, and his Verses much more harmoniously turned.

Soon after this appear'd *Monf. Jonquets* Catalogue of the Plants, in the Royal Garden at *Paris*, which had been just then restored and augmented at the Publick Charge, under the Direction of *Monsieur Vallot*, first Physician to *Louis* the *XIVth*. The *Garnsay Lilly* was too considerable a Plant, not to deserve a Place there, and it is not improbable that they were supply'd with it, out of *Morinus's* Garden; at least it cannot have been very common at that time about *Paris*: otherwise *Monf. Jonquet*, who appears by the Catalogue of his own
Plants

Plants, publish'd a few Years before, to have been very curious in Flowers, could not have been without it.

Dr. *Morison*, and Mr. *Ray*, the next Authors in order of time who have mentioned the *Guernsay Lilly*, have both satisfied themselves with barely copying *Cornutus*. One would have thought that so extraordinary a Plant, brought into *England* in so extraordinary a Manner, as shall be related in another Place, and thus as it were by chance made *English*, might have been thought worthy of a more particular Notice, by these two great *English* Botanists. But it is not in this instance only, that they appear to have been so wholly taken up, in ranking of Plants into several Classes, in dividing and subdividing them into innumerable Genera and Species, in inventing and improving the various Methods; that they could not allow themselves the time to examine any Plant which had been any how Described before them, even the most Curious and Remarkable, with all the accuracy they deserv'd.

Thus far therefore it is certain, that properly speaking, there has been but one Description ever given of the *Guernsay Lilly*; neither shall we meet with any more, if we look down from Mr. *Ray*, all the way to our own Times.

The great *Tournefort*, and incomparable *Boerhaave* have indeed told us, what Genus, Section, Class, and Order, this Plant ought to be ranked under; but as their Design is only to give us a methodical Index, or Catalogue of Plants, and a summary View of the several Genera's of them, we are not to expect from them particular Descriptions. The first makes the *Narcissus Japonicus* of *Cornutus* belong to the *Classis* of Plants, *Flore Liliaceo*, to that Section of these, which are *Flore Liliaceo ex petalis Sex composito, cujus Calix abit in fructum*, and lastly to the Genus of the *Lilio Narcissi*.

Dr. *Boerhaave* ranks it under the *Plantæ monocotyledones foliis Seminalibus Carentes, Bracteata*; to the fourth Order of these, which are *flore hexapetalo Ovarium complexo*, and to the *Lilio Narcissi* as the Genus: For all the rest, both these Authors refer us to *Cornutus*.

Kempferus has ranked it under that Class of *Japan Plants*, which are remarkable for the Beauty of their Flowers, but he contents himself with giving us the Names it goes by in that Country; and observing that it is the *Narcissus Japonicus* of *Cornutus*, to whom he refers for its Description, without so much as intimating the least Suspicion that these two Plants were not the same.

What Messieurs *Liger*, and *Bradley*, the only two remaining Authors who have so much as mentioned the *Guernsay Lilly*, have said about it, relates chiefly to the Method of cultivating it to the best Advantage.

Advantage. Not having hitherto had an Opportunity of examining this Matter my self, I have thought fit to insert the Observations of these two Authors; together with some Letters of the ingenious Mr. *Fairchild* upon the same Subject.

From these Authors who have indisputably all of them mentioned this Plant, I proceed to some others who are thought to have described it, but I am fully satisfied, have not.

Of these, *Clusius* is the first in order. This Author has indeed given us an Account of two Plants, called by him *Narcissus Latifolius Indicus rubro flore*, and the other *Lilio Narcissus Hemerocallidis Valentinae facie*, which agree in some things with our *Lilly*, but in many others they appear to be quite different; neither do his Figures of them at all resemble it: The same thing is to be said of the *Narcissus Jacobæus*, so first called by *Clusius*. This *Aldinus* has remarked to be a Plant quite distinct from his *Lilio Narcissus Indicus*, and it is still more so from my *Lilio Narcissus Sarniensis*.

I have heard it very confidently asserted, That *Aldinus* under the Title of *Lilio Narcissus Indicus Rubeus*; and *Ferrarius*, by the Name either of *Narcissus Indicus Liliaceus Saturato aut diluto colore purpurascens*, or *Narcissus Indicus flore Liliaceo Sphaericus* had described this *Lilly*; and I own that I was once inclined to be of the same Opinion, but at present, I am perswaded that they are altogether different; for reasons which will plainly appear by the Comparison of my Description, with the Text and Figures of these two Authors.

I have consulted as many other Botanical Authors, as I could reasonably expect might have mentioned this Plant, but in none of them do I find either Description or Figure that is not more different from it, than any of these that I have just now named.

The *Nobile par fratrum Johannes* and *Casparus Bauhini*, I am very well satisfied had no knowledge of it; for if *C. B.* has mention'd it any where, it must be by the Name of *Narcissus Indicus totus Ruber*, but then, he classes the *Narcissus Indicus totus Sanguineus*, and *Narcissus Jacobæus* as synonymous Terms for that, both which are known to be nothing like the *Guernsey Lilly*. And as for *J. B.* both his Descriptions and Figures of any Plant that comes in the least near it, are all copied from *Clusius*.

Sweertzius, *Passæus*, *Parkinson*, and others, who have all written expressly of Flowers, take no manner of Notice of this beautiful Flower.

Beslerus in the *Hortus Eystetensis*, the Authors of the *Hortus Malabaricus*, and *Commelinus* in the *Hortus Amstelodamensis*, have neither describ'd nor delineated it. Thus

Thus I have laid before the Reader, in a few Words, the Botanical History of the *Guernsay Lilly*, by which it is evident, that it has hitherto been but very imperfectly described in any Language, and never in *English*, nor by any *English* Author in *Latin*; and at the same time, I hope, that from the following Account of it, it will appear as evident, that no Plant in the whole flowery Race deserves more to be described with Accuracy, Precision, and Exactness, than this. And that mine may the better answer all these Conditions, I have digested what my own Observations have furnished me with, under the following Heads or Titles, *viz.*

<i>Nomen & Synonyma,</i>	Name and Synonymous
<i>Etymologia,</i>	Etymology. (Terms.
<i>Locus Natalis,</i>	Place of Growth.
<i>Radix,</i>	Root.
<i>Folia,</i>	Leaves.
<i>Caulis floriger,</i>	Flower Stalk.
<i>Perianthium,</i>	Cover Flower.
<i>Pedunculi,</i>	Foot Stalks.
<i>Vasculum seminale,</i>	Seed Vessel.
<i>Flores,</i>	Flowers.
<i>Petala florum,</i>	Flower Leaves.
<i>Stamina,</i>	Chives.
<i>Apices,</i>	Pendants, or <i>Sommets</i> .
<i>Stylus,</i>	Stillet.
<i>Melleus Liquor,</i>	Liquor like Honey.
<i>Cultura,</i>	Culture.
<i>Epilogus,</i>	Conclusion.
<i>Figureæ,</i>	Figures.

What the Reader is to expect besides, I have already acquainted him with in several Places of this Introduction. My Figures are all of them drawn from the Life, and the Description compiled from the most accurate Examination I was capable of making during the space of one Season; what further remains, and especially a delineation of the Structure of the Flowers viewed through a Microscope, must be refer'd to the next. And in the mean time I most earnestly beg of all Lovers of Flowers, and particularly the curious Gentlemen of the Island of *Guernsay*, that they would be pleased to transmit to me, any further Observations that may be made concerning this beautiful Plant. Which Favour I shall gratefully and publickly acknowledge.

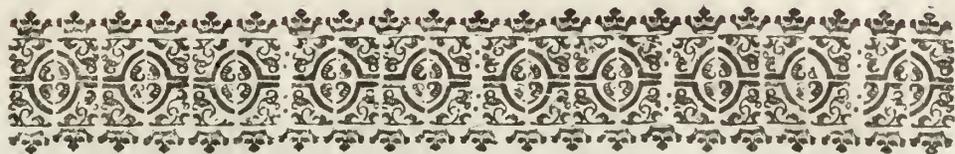
I have only one Word more to add by way of Introduction, and it is this: Of all the numerous Tribe of Authors, Botanical Writers

have in all Ages been the most deservedly famed, for the honourable mention they have never failed to make of such Persons as were either Benefactors to the Gardens in which they were concern'd, who sent them Specimens of curious Plants, or lastly, in whose Gardens they had the good fortune of seeing any such. *Clusius* has immortalized the Names of Monsieur *Plateau*, and a great many others of his Friends, by owning he was obliged to them for several of the Plants which he has so excellently describ'd. *Aldinus* has thought it necessary to acquaint us where he found the Plants, which he has examined, *viz.* in the *Farnesian* Gardens at *Rome*, *Ferrarius* in those of *Tranquillus Romaiulus* of the same City, and *Cornutus* those of *Johannes Morinus* at *Paris*. Did the Memory of *Gaston*, Duke of *Orleans*, deserve to be perpetuated upon no other score, It will ever live in Dr. *Morison's* Dedication of the *Hortus Blesensis* to King *Charles* the Second; and, to name no more, Dr. *Boerhaave*, in his late History of the Physick Garden of *Leyden*, seems to have had nothing so much in view, as to publish to the World, the Names of those Persons to whom it is indebted, for any part of the vegetable Treasure, which it contains at present.

As I have endeavoured to imitate these Great Authors, in the exactness of my Description, I should be loath to come behind them in point of Gratitude and good Manners. I cannot, therefore, let slip this Opportunity of acknowledging, that for the Flowers from which I principally took my Observations, I am obliged to the Right Honourable the Countess of *Hartford*, who did me the Favour to send me, last Summer, a considerable number of Roots, from her Ladyship's fine Gardens at *Marlborough*. They were planted for me in a proper Soil, by the skilful Hand of that expert Gardener, Mr. *Fairchild*, and they grew in Pots at my own House, where the Parlour had all the Advantages of a Hot-house, so agreeable to their Nature. There I had as full an Opportunity, as could be wish'd for in one Season, of observing them in all their different States, and since that time I have seen several others at Mr. *Fairchild's* at *Hoxton*, which I took sufficient care to compare with my own.



(1)



A

DESCRIPTION
OF THE
GUERNSAY LILLY.

Nomen

Narcisso-Lirion Sarniense :

OR THE

GUERNSAY LILLY.

Synonyma.

<i>Narcissus Japonicus rutilo flore.</i>		Cornut.
<i>Narcissus Japonicus ou Narcisse du Japon.</i>		Rapin.
<i>Narcissus of Japan : Or, Garnsey Lilly.</i>		Rea.
<i>Narcissus Indicus Rutilo Flore scintillis aureis asperso.</i>		Jonquet.
<i>Purple Narcissus of Japan.</i>		Evylin.
<i>Lilio-Narcissus Japonicus rutilo flore.</i>		Morison.
<i>The Guernsey-Lilly.</i>		Gardener.
<i>Seki San</i>	} <i>Japonicè.</i>	Kempfer.
<i>Sibito Banna</i>		
<i>Doku Symira</i>		

LOCUS

LOCUS NATALIS.

Cornutus, whom we have already observed to be the first Author who has describ'd the *Guernsay Lilly*, informs us likewise, that it is originally a Plant of *Japan*, and by what Means those of them, which he had an opportunity of seeing, came first into *Europe*. *Johannes Morinus*, no doubt, a very curious Person, was at a great deal of Pains and Charge to have it brought from *Japan*, and cultivated it in his own Garden at *Paris*, and at length, on the 7th Day of *October* 1634. he had the Pleasure of seeing it in full Blossom. *Inter omnes Narcissos qui haecenus in visi apud nos extiterunt, prima, ut Arbitror, Auctoritas nobilissimo huic generi debetur, quod paucis abhinc Annis ex Japonia allatum, strenui admodum & nullis sumptibus parcentis viri Johannis Morini cultura, tandem in florem prosiluit septimo mensis Octobris anno Domini 1634.*

This Garden of *Morinus*, was famous for the uncommon exotic Plants contained in it, three and twenty Years after the Time that *Cornutus* here mentions, for *Dr. Morison*, in his *Historia Oxoniensis*, takes Notice of his having seen there the *Narcissus Indicus sphaericus flore Liliaceo* of *Baptista Ferrarius* in the Year 1657.

Kempferus saw it growing in *Japan*, where he remain'd two full Years, and by the variety of Names he found for it amongst the Natives, it is plain they took no small notice of it.

After these express Testimonies of *Cornutus*, and *Kempferus*, it is something surprizing that there should be any Body found, to deny its being originally a *Japan Plant*; especially they having no other pretence for such a Conceit, but meerly that the Flower Leaves of the *Guernsay Lilly*, when view'd in the Sun, appears very much to resemble that sort of Varnish call'd *Japaning*; but at this rate, the Truth of all Facts may be call'd in question, by every Person who has fertility of Imagination enough to invent Conjectures and far fetch'd Similitudes, as Arguments against them: It ought rather to have been concluded, that since that Workmanship, as well as this Plant, came first from this happy Island, the first Invention of it might probably be owing to the beautiful Mixture of Colours and Sparkles observ'd on these Leaves.

That the original native Soil of this Plant was *Japan*, is further confirm'd from the manner of its first being brought into the *British Dominions*. This happen'd by a very singular, melancholy Accident; of which *Dr. Morison*, who no doubt, had it from some Persons, than residing in *Guernsay*, gives us the following Account in the Book abovementioned. A *Dutch or English Ship*, 'tis uncertain which, coming from *Japan*, with some of the Roots of this Flower on Board, was cast away upon the Island of *Guernsay*; the Roots
were

were thrown upon a Sandy Shore, and so by the Force of the Winds and Waves, were soon buried in Sand: there they remain'd for some Years, and afterwards to the great Surprize and Admiration of the Inhabitants, the Flowers appear'd in all their Pomp and Beauty. The Lord *Hatton* was then Governour of that Island for King *Charles* the II^d. His second Son was by good luck a curious Person, and a great Lover of Flowers, and therefore he not only took care to transplant and cultivate this Flower himself, but sent Roots of it to a great many Botanists and Florists in *England*. *Ejus Radices*, (says the Doctor,) *ex Japonia allatae, & ex Nave Naufraga Batavica an Anglica incertum, ejectae in littus Arenosum Insulae Guernsay, ditioni Serenissimi Caroli Secundi subjectae; ibi inquam Bulbi incuria projecti in littus Arenosum, inter sparta Maritima, & vento fortiore Arenam eò pellente, quâ demum praedicti Bulbi tecti post aliquot Annos summâ cum Incolarum admiratione, flores rutilos amplos & elegantes sponte dedere. Hoc flore detecto, aliquot annis postea radices plurimas communicavit Botanicis & elegantium florum cultoribus Dominus Carolus Hatton, filius natu secundus Nobilissimi viri Christophori Hatton, Baronis de Hatton, & Insulae Gernsay praedictae gubernatoris.*

This Honourable *Charles Hatton* was not only a great Patron of Botanical Learning, but esteem'd so good a Judge of it himself, that the late famous Mr. *Ray* was not afraid to own that it was by his Advice and Direction that he undertook his great History of Plants; and therefore thought him the most proper Person to inscribe it to.

He had receiv'd the first Tinctures of this valuable Branch of Natural Knowledge from Dr. *Morison*, while Director of the Royal Garden at *Blois*; and it was easy for a Person of his Genius to improve upon so good a Foundation. That Capt. *Hatton* had been Scholar to Dr. *Morison* is very well known to a great many People still living, and further appears by the following Inscription under his Coat of Arms upon Plate 1. Sect. 14. of the third Part of that Authors *Universal History of Plants*. *Auspiciis Honoratissimi & Doctissimi D. D. Caroli Hatton, Filii Domini Hatton, Baronis Liberi Angliae, Scientiae Naturalis Cultoris & Fautoris Eximii Authoris olim in Botanicis Discipuli.*

I am inform'd that this Gentleman died here in Town about two Years ago, in a very advanced Age.

ETYMOLOGIA.

From the Resemblance that this Plant bears, both to the Lilly and Daffodil, it is very properly express'd by a Word compounded of the Names of these two Flowers, viz. *Ναρκίσιος* & *λίλιον* *Narcissus* & *Lilium*.

It is like the Lilly in its Flowers, Seed Vessels, and Seeds; but differs from it in its *Vagina membranacea*, which incloses the great bunch of Flowers. This the Lilly has not.

It agrees with the Daffodil in its Root, Leaves, and bare Stem or Flower-stalk; and also in that the Leaves come out after the Stalk. *Narcissus Caulem prius deinde folia promit*, as *Cornutus* expresses it.

Dr. *Morison* introduces his Account of the *Lilio-Narcissi*, by a Remark not unlike this, which therefore it will not be improper here to Insert. *Quia flores producunt Liliorum instar, Capsulasque pariter eorundem Capsulis similes, seminaque itidem conformia Liliis; Lili nomen in compositione præfiximus, quia denominatio omnis debet a nobiliore & potiore parte desumi, atqui flores & Capsulæ seminales, ipsaque Semina primatum in omni genere obtinebunt. Sed quandoquidem radices omnium harum infra describendarum Plantarum sint perfecte bulbosæ, & multis pelliculis seu tunicis Majoribus involventibus minores præditæ, Narcissorum reliquorum more, non autem squamosæ vel squammatæ, Liliorum proprie dictorum modo, nos aptiore titulo Lilio Narcissos designavimus, quoniam utriusque scilicet Lili & Narcissi Naturam participant, nomen sic compositum obtinebunt.*

The reason of its being called *Narcissus Japonicus* and the *Guernsey Lilly*, we have seen under the last Head, and *Sarnia* being the *Latin* Name used by *Antoninus* and other *Roman* Writers, to express the last of these Islands, I have term'd this Plant *Lilium Sarniense*, it being of more consequence to us to know that it grows naturally in *Guernsey*, than that it came originally from *Japan*.

R A D I X.

THE Root of this beautiful Plant is of the bulbous tunicated Kind, made up of several smooth, thin, juicy Coats, Rinds or Shells, drawn or cas'd over one an other, surrounded with two membranous Involucra; and arising, together with several Fibrae, from a round Basis or Trunk.

To begin by the Involucra, which present themselves first to our View, The External is a kind of dry Skin or Film, of a light brown Colour, thin and pretty smooth, covering the whole Bulb, and lower part of the Neck. The Inner is a much finer Membrane, of a whitish Colour, laid over the Bulb only: when wetted it is easily rubbed off, appearing of the consistence and texture of a Cobweb, from whence I call it *Involucrum Arachnæideum*. When it is dry we may observe several Vessels like Threads, running parallel, and at equal distances upon it, from below upwards.

These Cas'es being remov'd, the Root comes next to be examin'd; and it may be divided into two general Parts, the Bulb and Neck; both which being considered together, their Figure and Shape can be expressed by nothing better than by comparing it to that of a Glass Receiver, with a wide Belly, long Neck, and a flat Bottom supposed to be added to it.

The Figure of the Bulbs themselves, where the Roots grow single, is every where similar, and resembles an oblong Spheroid depress'd at both Ends. But having sent out Off-sets, of three or four Years growth, as the Bellies of these begin to swell, they press upon the Mother Bulb, and so flatten these Sides of it, which they touch. Thus according to the number of such Off-sets, these Sides are formed into so many different Plans, joyned at Angles more or less obtuse.

When the Off-sets are numerous, they receive the same Impressions from one an other, which they give to the Root from whence they spring. To be satisfied of this, we need only view a bunch or groupe of Roots that have stood some Years in the Ground without being transplanted.

In a full grown well-fed Root, the middle or thickest part of the Bulb is about six Inches in Circumference. Some Roots are bigger, but the far greatest Part are much less.

In a bunch or cluster of Roots, which I took out of the Ground about the middle of *November*, consisting of six Off-sets, all proceeding from one Root, the several Circumferences and Weights were as follows.

1. The largest or Mother Root, measured six Inches and a Quarter.
2. The next five Inches.
3. Four Inches and a Quarter.
4. Four Inches and an Eighth.
5. Three Inches and three Eighths.
6. Three Inches and a Quarter.
7. Three Inches.

The Weight of the Mother Root was three Ounces and one Dram.

2. One Ounce, two Drams and an half.
3. One Ounce, one Scruple.
4. Six Drams and an half.
5. Half an Ounce and one Scruple.
6. Half an Ounce.
7. Two Drams and an half.

The narrow part of the Root which lies between the Bulb and appearance of the Leaves or Stalk, is the Neck, in which we may observe the Endings of four, five or six of the innermost Laminæ.

It is commonly about one Inch and an half in length, in some more, and in others less, according to the growth of the Plant.

Where it is biggest, it measures near two Inches in Circumference, ending somewhat narrower than where it began.

It is not round but flattish, being adapted to the figure of the Leaves or Stalk, that lie within it.

From

From this general View of the Root, it is now time to proceed to the particular Parts whereof it consists, which are the Basis, Tunicks, and Fibers.

The Basis or lower part of the Root, called by the learned *Malpighi* (in Plants of this kind) *Truncus Radicalis*, is a solid and hard Substance. of a whitish yellow Colour, and round or circular Figure; from whence the *Tunica*, *Leaves*, *Stalk*, *Fibrille*, and *Off-sets* do all arise. This in all the breeding Roots is very large.

The Bulb itself, both Belly and Neck, is commonly made up of twelve Tunicks or Coats, that cover one another; being kept tight, and bound close in their Places, by means of small, short, transverse Fibres; together with a slimy, viscid, roapy Humour, that moistens their Sides, and glews them as it were together.

These Coats may very well be divided into roundish and longitudinal. The first are Six in Number, and form the belly and beginning, or biggest part of the Neck; the Coats that remain I call longitudinal, because they are carried streight up from the Basis, within the other Six or Seven, and make the smaller part of the Neck; they immediately cover, support, and strengthen the Leaves like so many Cases, ending in different Plans.

The top of each of these long Tunicks is tipt and lengthened out by a kind of dry, shrivel'd, thin Skin, or Film, with streight Fibres, which is nothing else but the remains of the fresh Leaf continued with them. These several Skins easily separate from one another, and so appear tore or ragged, they seem designed for warm Coverings, to those *Tunica* which lye under them, as the Involucra are to the Bulb.

On the inside of all the Tunicks, especially the six outermost, the same sort of Vessels are visible, which we already took notice of, in the inner Involucrum.

In a flowering Plant, the Disposition of these Tunicks is a little varied.

Both Leaves and Stalk are cover'd by nine Coats. When these are removed on the out side of the Stalk, there appears a half Coat, very thick, and bunching out a little at Bottom; but it grows thinner as it rises higher, and the top of it is tipt with a thin dry Skin like the rest.

The Leaves are cover'd a-part by two longitudinal Coats, which are much thicker at bottom than the other State; and indeed quite through, much stronger.

Between the beginning of the Stalk and the outermost of the proper Coats of the Leaves, there rises up a Process in form of a Wedge or Tongue, which is very broad, and thick at bottom, and grows narrower and thinner at top, between two and three Inches in length. This Process seems to me to be what is left of the other Side of the Case, for the Stalk just mentioned, but why these two should not have been continued as well as the other Coats, is, I own, to me as yet a Secret.

From the Edge of the Basis, or Heart of the Root (as the Gardiners call it) arise eight, ten, or sometimes twelve pretty large *Radiculae* or *Fibræ* of a white Colour; some of them are about the bigness of a large Goose Quill, and six or seven Inches in length, and may perhaps, grow much longer when they are not confined in Pots: Others of them again, were a good deal shorter.

From each of these *Fibræ* there arise abundance of smaller *Fibrillae*, or Strings, by all which the Plant draws its nourishment from the Earth it grows in. These *Fibrillae* are from one, to two, and three Inches in length.

Between these *Fibrillae* or *Radiculae*, we observe several small blind Holes.

Upon taking a Root out of the Ground in the middle of *March*, when the Leaves were withering, I observ'd a great many of these *Fibræ* to be quite shrivel'd up and wasted.

Cornutus has informed us of nothing that belongs to the Root of this Plant, but that it is bulbous, and like those of the other *Narcissi sub est Bulbus prioribus similis*.

Kempferus tells us, that in *Japan* the Root is looked upon to be Poisonous; and this is all he says about it.

F O L I A.

THE Leaves of all the Plants as well those that Flower, as those that do not, arise from the middle of the *Fundus* or very lowest part of the Root, and are continued up through the Bulb, ascending in a streight Line, involved in all its Coats; three or four of which accompany them for about an Inch or more above it, serving for a Case to support and strengthen them, while tender and weak.

That part of the Leaves which is above the Root, is of a dark Willow Green, but withal they appear, it as were, shining or lucid.
That

That Part of them that lyes within the Root, is of a White Colour inclining to Yellow, a little before they leave the Sheath, and take on the Green.

They seem all smooth and soft the touch, and they are a little obtuse or blunt at the ends.

In what has been hitherto mentioned all the Leaves agree, but there other things that are peculiar to them, according to the two different States in which they may appear.

In a flowering Plant the Leaves begin to Spier or come forth, about the latter end of *September*; they all ascend by one side of the *Caulis*, and are never observ'd to surround it.

In two Plants that flower'd late this last Season, the Leaves of the one were eight Inches high, and those of the other, seven, on the 30th. Day of *Nov.* *Decem.* 25. the longest measur'd 15 Inches, and the other a little above 13. *Feb.* 3. the longest Leaves measured just 22 Inches, the warmth of the Parlour having drawn them out to this great and unusual Length. The Tops of these long Leaves began to wither and dry, about the latter end of *February*, and then I pulled them out of the Pots where they grew, they were both about half an Inch broad; and in the first they were four in Number, in the other five. Mr. *Fairchild* assured me he seldom observ'd above four, and never six in a flowering Plant.

In Mr. *Fairchild's* Garden, the Roots that flower'd last *Autumn*, had Leaves from 11 to 13 Inches in length, *March* 7. 1724-5. still fresh and very green; and 3 quarters of an Inch in breadth.

In a Plant that does not flower, the Leaves appear above Ground about the middle or end of *August*.

The number of Leaves in such Plants is uncertain, differing according to the Age of the Root: A *Surculus* or *Off-sett* of the first Year, has for the most part, but one long narrow Leaf. I once observ'd two in a flowering Plant, and sometimes the second shews no Leaf above the *Tunicæ*. About the latter end of *November*, as the Roots increase in Age, they have gradually two, three, four, five, and sometimes even six, or seven Leaves; but I do not know if ever they exceed that Number; and I am apt to believe that when a Plant has once six Leaves, the Year following it will certainly Flower.

I cannot determine the Heighth or Length of the Leaves, having not hitherto had an opportunity of observing them sufficiently in all their
their

their different Ages. In a fine groupe or cluster of Roots, that came last Summer from *Guernsay*, and had stood here for some time in the Ground, and afterwards in a Pot in my own Parlour, the Mother Root had six Leaves, the longest of which, on the 9th of *November*, measured full nine Inches, and was above half an Inch in breadth; and by the 30th of the same Month, it was eleven Inches high, having gained two Inches in three weeks time.

Cornutus has taken notice of the Leaves of flowering Plants only, and he has said but very little, even about these: According to him they do not appear till the Stalk decays, and they are of a pleasant green Colour, *folia vero non nisi tabido Cauli erumpunt, quorum color non glaucus nec obscurus sed grata viriditate renidet.* Whether by the time the Leaves appear, the Stalk may not be in a State of Decay, I shall not dispute; but 'tis certainly a considerable time after, before any such thing becomes sensible either to the Eye or Touch.

CAULIS FLORIGER.

THE *Caulis*, Stalk or Flower Stem arises, as has been already observed from the hard Substance in the bottom of the Bulb; and about the middle of *August*, or sometimes later, it begins to sprout out, or appear above the top of the Root, being very smooth, and without Leaves during its whole Length.

That Part of the Stalk which is within the Coats of the Root, is of a whitish Colour: for about three or four Inches above the Root, it inclines to a dark Red with a Purple cast; but afterwards that insensibly passes into a Green, which is continued upon all the rest of the Stalk.

When it dries and withers, the Green is changed into a kind of Straw-colour, and the Purple-red into a lighter.

The Figure of the Stalk is not exactly Cylindrical, but rather that of a Solid, whose Basis is an Ellipse, for it is a little depressed or flattened on two opposite Sides, and when it begins to dry, after the Flowers are decayed, it becomes thin, with two or three longitudinal Ridges upon it.

The length of the Stalk, in a Plant in full Bloom, is always between thirteen and seventeen or eighteen Inches, measured from the top of the Root, to the rise of the Perianthium. The length of the Stalk, whence I took my Figure, was just fourteen Inches. The Circumference at the top of the Root is exactly an Inch, and
towards

towards the upper part of the Stalk, three quarters of an Inch, in some a little less.

Immediately above the Root, the longest Diameter of it is seven sixteenth parts of an Inch, and the shortest five sixteenth Parts.

Just under the rise of the Flowers, the longest Diameter is a quarter of an Inch, the shortest three sixteenth Parts.

The Stalk is without any hollow or cavity in the Middle, and very strong in proportion to its Bigness; being thus enabled to bear up and support that large Bouquet or noble bunch of Flowers, with which it is, for so long a Time, adorned: However we often meet with it bent in one or more Places, and inclining downwards.

Cornutus describes the Stalk to be without Leaves, a Foot high, green on the upper Part, and below marked with innumerable purple Specks. *Spectabilis Thyrsis per Initia nudus foliis, paulatim sese in pedis altitudinem subrigit; superiore parte virens, inferna mille atro-purpureis notis infuscatus.*

PERIANTHIUM.

WHile the Flowers of this beautiful Plant are forming, they are covered and inclosed by a sort of Vagina or Case, made up of two distinct membranous Films, arising round the upper part of the Stalk, whereof one is much larger than the other.

They are of a reddish Colour, and a triangular Figure, the Base (*i. e.* where the Perianthium adheres to the Stalk) being half an Inch long, and the perpendicular Height one Inch three quarters.

Before the Flowers are blown, the Perianthium appears of the shape of a Tulip before its blown, but when these arrive at a certain bigness, they burst open the Case, and it falls back in two Pieces.

Between the two membranous Films, and the beginning of the Pedunculi, there are nine, and sometimes more small and narrow Filaments, that hang down like so many Threads or Lacinia, of the same Substance and Colour with that of the Perianthium. These continue on the Stalk till the Flowers are quite withered and decayed.

Cornutus has only mentioned the figure of the Perianthium, and that not very distinctly neither: *florum gemma* ——— *quae prius oblonga & rotunda quadam vagina membranacea celabantur.*

F

P E D U N .

P E D U N C U L I.

THE Foot Stalks that support the Flowers, and are always equal to them in Number, arising from the top of the *Caulis* or Flower-Stem; those nearest the Center almost in a right Line with the Stalk, the rest spreading outwards, at a greater or less Angle with the first, in proportion to their Distance from them.

Their Colour is the same with that of the *Caulis*.

They are not all of the same Length, in the same congeries of Flowers: The longest, measured from the *Perianthium* to the *Vasculum Seminale*, I have commonly found to be 1 Inch 5-Eighths, the shortest 1 Inch 1-Eighth, and all the rest between these two.

Their Figure comes near that of Prism generated by a Triangle, whose Base is 3-16th Parts of an Inch, and Perpendicular Altitude 1-8th Part.

All that can be learned from *Cornutus's* Account of the *Pedunculi* is, that there are such belonging to this Plant, and that their Number is equal to that of the Flowers. *Florem gemmæ totidem petiolis herentes.*

V A S C U L U M S E M I N A L E.

AT the top of each Pedunculus we observe a short, thick, knobby Part, which constitutes the *Vasculum seminis*, or Seed Vessel.

Its Colour is much the same with that of the Flower Stem and Pedunculus.

The Figure of it is nearly that of a triangular Prism, a little depress'd near the Bottom and Top.

The Height is about a quarter of an Inch, as is likewise the Base of the generating Triangle, measur'd at the widest Part, and the perpendicular Altitude three sixteen Parts of an Inch.

The Inside of the Seed Vessel is plainly divided by membranous Septa or Partitions, into three Loculamenta or Cells, each of which is filled with small white Seeds in great Numbers.

The

The Seeds of this Plant never come to any Perfection in these Northern Countries, neither does the Seed Vessel at all swell, after the Flowers are decayed; but on the contrary shrinks and dries up.

Cornutus has taken no manner of notice of this Part of the Plant.

F L O R E S.

MAny curious as well as entertaining Observations and Figures, might have been made concerning the gradual explication and unfolding of the Flowers, while they remained as yet in their infant State, wrapt up in the Perianthium, and also from the time that Membrane began to open, till they arrived at their utmost Perfection. But having neglected these in the proper Season, I am obliged to defer them till another.

At present, therefore, I shall consider them only after they are fully blown, observing however, by the by, that the Flowers begin to appear about the latter end of *August*, sometimes sooner or later, according to the Season, the strength and fulness of the Root, and above all, the warmth of the Place where they stand: They come forth gradually, for in one of my Lillies, I observed three Weeks between the full opening of the first and last Blossoms.

The number of Flowers in each Plant is not always the same, one of mine had eleven, the other nine. At Mr. *Fairchilds* I saw one with seven, another with eight, and a third with ten.

The largest Circumference of each Flower, is about seven Inches, the Diameter of it two Inches and a quarter.

The Circumference of the whole congeries or bunch of Flowers belonging to one Plant is different, according to the number of these, but their situation, with respect to one another, is always pretty much the same, for when view'd altogether, they appear to form a large and beautiful segment of a Sphere, whose Center is some where near the Origine of the Pedunculi.

The Flowers continue in full Bloom for about six Weeks, [and then begin to decay and contract, and at last quite wither and dye; and so remain in a fading Bloom about one Fortnight longer.

Cornutus has observ'd, that there is sometimes nine or ten Flowers upon one Stalk, disposed in form of an Umbrella. *In Thyrsi fastigio Novem aut decem florum gemmae in Umbellam disponuntur.*

P E T A.

P E T A L A F L O R U M.

EACH Flower is made up of six Petala or Flower Leaves, and from thence it is, that our Lilly comes to belong to the Classis of Plants, *flore Liliaceo Hexapetalo.*

These Petala begin by a kind of narrow short Neck, called commonly *Unguis*, from a whitish, soft, juicy Substance, which lies immediately upon the *Vasculum seminale*, and from whence the Stamina do likewise arise.

This middle Substance has been but very indistinctly taken notice of by Botanical Writers, before *Pontedera*, and by him, on account of the use he assigns to it, of which anon, it is termed *Receptaculum*.

The upper and inner Part of it has been by other Authors termed sometimes *Floris Umbilicus*; and that part of it, through which the Stylus passes, *Centrum Umbilici*. And in this Plant, regard being had as well to its apparent Use, as to its Figure, and Situation, it cannot be more properly express'd, than by calling it, *Basis sive Umbilicus floris*.

Three of the Petala run in a streight Line with the Angles of the Seed Vessel, and arise a little lower and further out than the others, which are opposite to the flat Sides of it.

A full blown Petalum is one Inch three quarters long, but when the Flowers begins to open, and just show the Apices coming out, it is only one Inch and three eighths.

The greatest part of it is of an equal Breadth, *viz.* three eighth parts of an Inch, but it terminates at last in a Point, beginning to grow narrow about half an Inch before it ends.

The surface of both sides of the Flower Leaves is exactly smooth and even, without the least Roughness. On the greatest part of the upper Side, there is a kind of Sulcus or Hollowness, and on the Backside a smooth Ridge, formed by the *Costa* or Rib that runs through it lengthwise.

They run streight for some space, and afterwards the Point turns gradually, first back, then inwards and upwards, not unlike the Mountain or Marragon Lilly, but without making near so full a Circle.

The Edges are smooth from their beginning to the place where the Petala turn down, and from thence to their Extremity, they appear as if they were curled or pinched. This alteration in the Edge is not easily discerned while the Flower Leaves lie streight in the *Perianthium*, but as soon as they are full blown the Pinch is very plain.

I am at last come to the most beautiful and charming part of this Flower, which is its Colour. This, I confess, I am not able to describe with that Accuracy and Liveliness which it deserves; however in the main, I may venture to say, that each Flower, while in its prime, looks like a fine gold Tissue, wrought on a rose-colour'd Ground; but when it begins to fade and decay, it looks more like a silver Tissue, on what they call a Pink Colour.

When we look upon the Flower in full Sun-shine, each Leaf appears to be studded with thousands of little Diamonds, sparkling and glittering with a most surprizing and agreeable Lustre; but if we view the same by Candle-light, these numerous Specks or Spangles look more like fine gold Dust.

What that uncommon Appearance proceeds from, or how to account for it, I own I cannot tell, but must leave it to others of better Judgment; however since it is very certain that there is nothing to be seen without the help of the glorious Rays of the Sun, or the adventitious Light of a Candle, on either surface of the Leaf, it would seem as if it were owing to something contained between these: And why not to some Globules in their circulating Juice, through the minute Vessels which the late Improvements in Botanical Anatomy have discovered to us? And what seems to confirm this Conjecture, is an Observation which I have made, that when the Flower Leaf is fading, these *Micæ* or Sparkles do not shine with half the Vivacity and Brightness, as when it is in its prime and state of Perfection: The Juices then being quite altered, or almost spent and exhausted, so that the Spangles become less lively.

But to be more particular, the narrow neck of each Petalum, is of a whitish Colour, and from thence upwards, about the middle of the Leaf, on the Inside, there runs a Streak of a deep Scarlet, which being about one Inch in length, before it is insensibly lost; all the rest of the Leaf is much of the same Colour as I have described it above.

The backside of these Petala, is chiefly of a paler sort of red or Pink Colour, but the *Costa* or Rib is much whiter.

A Friend of mine, who is very nice in distinguishing of Colours, assures me, That in this Flower there is a beautiful complication of different shades of Red, that all follow one another: For when it is in its Prime, there may be plainly discerned in it. 1. A Carnation. 2. A pale Scarlet. 3. A fuller Scarlet. 4. A Modena. And 5. a Crimson. In short, the whole Flower together looks like a gold Tissue with a velvet Pile, when view'd in the Sun-shine.

When the Flower had stood in Bloom about six Weeks, it began to decay, and the Colours to fly off; and then it appeared more like a silver Tissue upon a prince Colour, that is, a Red out of Grain, being fullest towards the Middle, and palest toward the Edges.

But as the Flowers begin to contract, shrivel, and wither, then the Petala assume a deep Crimson Colour, which continues till they quite dry away.

The Colours of the Petala being that principally in which the Beauty of this Plant consists, I shall subjoin to *Cornutus's* Account of these, the manner in which other Authors, since his Time, have thought fit to express them.

Cornutus begins by observing, that if the Plant stands in a good Soil, each Flower has six *Petala*, two Inches long each, and with a small Sulcus running along them. That they are reflected like those of the Martagon Lilly, and draw at last to a Point. That the Colours are so extremely Beautiful and Fine, that it is impossible to imitate them, but they come something near to that of Cinnabar, or the finest sort of Gum Lacca. This Author takes notice likewise of the Spangles that appear in the Leaves when view'd in the Sun. *Dum Gemmæ florem patefaciunt in sex folia deducisolent, si potissimum planta hæc resolutâ & pingui humo seratur, nam si sicca & confecta posita sit, soli macies plerunque nonnullos uno aut alio folio mutilat Singula cujusque floris folia duas uncias sunt longa, admodum angusta & exiguâ veluti lacunâ sulcata. Juxta floris centrum brevi cacumine gracilescunt, extrema parte reflexa resupinantur (pro more Lili Montani quod Martagon vocant.) Color floris est Cinnabaris aut lacca elegantioris, vena sanguinea tamen lacunarum media discriminante Unus odor abest, ejus defectum Natura supplevit vivacitate coloris, quem non modo pigmentorum mixturæ Artificio quisquam assequi nequit, sed nec ullis hæctenus floribus similem concessisse naturam observatum est. Nam præter eximium hunc colorem quo intuentium obtutum hebetat; si forte serenus dies affulserit, floremque radiis sol meridianus illustraverit, mille velut scintillas evibrat, quos pertinax oculus inconnivensque vix momento sustineat.*

R A P I N.

R A P I N.

*Est etiam extremo qui nuper venit ab orbe
Narcissus flores lucenti concolor ostro
Auratisque litus maculis, ceu sparserit imber
Aureus egregium texto sub murice florem
Qui possit tyrios foliis hebetare tapetas.*

E V Y L I N.

*Purple Narcissus of Japan now Flow'rs,
Its Leaves so shine as if with golden Show'rs
It had been wet, which makes it far outvy
The Lustre of Phenicean Tapistry.*

G A R D E N E R.

*Late from Japan's remotest Region sent,
Narcissus came arrayed in scarlet Paint;
Rich spots of Yellow stain the precious Flow'r,
As if besprinkled with a golden Show'r.
The radiant Tinctures may with Tap'stry vie,
And proudly emulate the Tyrian dye.*

R E A.

The Garnsey Lilly bears in October Peach-coloured Flowers.

B R A D L E Y.

*The Guernsey-Lilly has hardly its equal for Beauty among the
flowering Race. The Blossoms are large, and not unlike those of the
Lilly in their make, seemingly powdered with gold Dust upon their
Rose-coloured Petals.*

S T A M I N A.

THERE are commonly six Stamina in each Flower, but I remember I once observed seven besides the Stylus.

They are all of one Colour, *viz.* a lighter Scarlet than the Petala, and when they begin to fade, they become something paler.

I have already observ'd, that they proceed from the Umbilicus, on the inside of the Petala.

Their Figure inclines to be round, only two opposite Sides of them are a little depressed. They are thicker at Bottom than at Top, towards which they run gradually tapering.

The longest two (for they are most commonly paired) are in some Flowers two full Inches, in others about one eighth part of an Inch less. The two shortest are one Inch and a quarter, and the rest, between these two Extrems.

Cornutus takes notice, that the Stamina are six in Number, that they are longer than the Flower Leaves, and of a paler Red. *Sex stant in mediò Filamenta, foliis longiora, & pallidius Rubentia.*

A P I C E S.

THE Apices, Sommets or Pendants are alway equal in Number to the Stamina, on whose pointed Extremities they hang in so easy and loose a Manner, as to be moved or shaken by the least breath of Wind.

Each of them is seemingly double, having a deep Sulcus or Furrow running along their under Side.

Upon their first appearing after the Flower is blown, and for some Days longer, they are all of a deep Crimson, or rather Purple Colour. Afterwards they look of a whitish Grey, which proceeds from the *Farina fecundans*, with which they are then loaded, being of that Colour. As this Dust falls off, they begin insensibly to contract and shrink, and become very small at last, and of a black Colour.

When

When these trembling Pendants are at the biggest, they are three Inches and one eighth Part in length, and one eighth Part broad or thick.

Cornutus mentions only the Number and Colour of the Apices; *Filamenta totidem Apicibus atro purpureis ornata.*

S T Y L U S.

THE Stylus of each Flower springs by a threefold Beginning, from the three Cells of the Vasculum feminine, passing thro' the center of that Substance from whence the Petala arise, in the very middle of the Stamina which surround it.

It is of the same Colour with that of the Stamina, *viz.* a light Scarlet.

It is apparently a hollow Tube, and is wider at bottom than at top.

At first it is near of an equal height with the Apices, but as soon as most of the male Dust is shed, and there is no more occasion for its Reception, it grows about a quarter of an Inch higher, being then about two Inches and a quarter.

Till the Apices are become very small, and the Flower begins to change its Colour and fade, there is nothing to be seen on the extremity of the Stylus, but then it appears crowned with a short hairy kind of Substance, like a tuft or pile of Velvet, of a greyish, yellow Colour, and a triangular Figure.

The Stylus stands a good while after the Petala and Stamina are decayed.

Cornutus has not mentioned the Stylus at all, neither has he so much as included it in the Number of the Stamina.

MELLEUS LIQUOR.

During all the time that the Flowers continued fresh and blooming, and even after they began to decay, I never failed to observe upon the outer Surface of the *Umbilicus* or middle Substance at the Root of the *Petala* and *Stamina*, a few small Drops of a transparent, clear, and viscuous Substance, sweet to the Taste, and of a perfectly liquid Consistence, like that of a thin Syrup.

Not believing that this *Melleous Liquor*, as it may be very fitly called, could be peculiar to this Plant only, I judged it worth while to consult a good Number of the most accurate Botanical Writers, to see how they had accounted for what I then thought to be a very surprizing Phænomenon: And as amongst all those I had recourse to, (one of whom was our learned Country Man Dr. *Grew*) there are but very few who seem to have ever observed it, the Reader I am persuaded, will willingly allow me a short Digression, in order to lay before him what these few have told us about it.

Casalpinus, to whom the World owes the first Hints of more Discoveries in Nature, than they are willing to allow him the Credit of, is the first that I can find to have remarked this Liquid Substance in Plants. Talking of the wonderful Contrivance of Nature, for the Security and Protection of the Seed, especially in its Embryo State; he tells us, *Flores igitur partim necessitate partim ad tuendos fructus incipientes dati sunt, ex necessitate quidem, quoniam turgente planta, ut in Venere solent Animalia, efflari necesse est aliquem spiritum, non enim sine spiritu fit seminis eruptio; quod autem ex hujus modi substantia flores Orti sint, manifestum est; id enim indicant & substantie tenuitas qua constant, & odores quos ut plurimum Spirant; indicat & Mellea dulcedo, quæ in plerisq; reperitur, quamq; apes feligentes in suos alveolos recondunt, ut enim mel Æreum ex percoctâ a sole exhalatione nascitur, roris modo ex aere decidens, sic ex plantæ halitu percocto, qua parte egressum habet, veluti sublimatum floris Concamerationi & staminibus hæret alterum genus mellis quod apes colligunt & favis reponunt.*

From this Passage we learn with relation to our present Subject, That according to *Casalpinus*, such a sweet Liquor or Honey as I have described, is to be found in most Plants; that this is what the Bees carry off from them, and of which their Honey is made; that it is nothing else than the more spiritous Parts, exhaled from the Juices of Plants, or rather thrust out from them, by the Force and Pressure of the succeeding Sap: And lastly, That the Place where it is found, is the *floris concameratio*, which may either mean the whole Cavity of the Flower, or only the Bottom of the Inside of it. From what the

Author

Author adds concerning the *Stamina*, and what I always experienced in my Plant, it is probable he meant the last of these.

The accurate *Malpighi* has not suffered this part of Flowers to pass unobserved, tho' as 'tis evident from many other Places of his excellent *Anatomy of Plants*, *Cæsalpinus* may perhaps, have led him to the Consideration of it: *Mirabile est*, says he, *quod natura quasi conchas in florum foliis excitavit quibus mel custodiret, ita in Corona Imperiali, Lilio Persico & Ranunculo miramur. In hujus interiore parte non longe ab implantatione, concha rotunda observatur, quæ melleo diaphanoq; semiconcreto succo repletur, hanc mire cooperit velabrum. In Corona Imperiali fovea hæc exterius labro ambitur, & deorsum pendula Semisphærica appenditur gutta.*

Interdum dubitavi an tenuis quædam adsit membranula contentum icorem coercens, ne deorsum effluat, applicato tamen digiti extremo, a forvea rapitur, sicut accidit in reliquis aquæ & fluidorum guttulis quæ suspensa pendent: Hinc meditari possumus melleam hanc substantiam non exterius advenire, sed ex succo intimius concocto hujus modi congeri materiam.

In digitali pariter prope umbilicum melleæ substantiæ aliquot guttæ recolliguntur.

That *Malpighi* here, means the same Liquor with *Cæsalpinus*, is apparent, both from the Qualities he ascribes to it, and the way he supposes it to be produced, and although according to the Method he follows in the *Anatomy* of all the Parts of Plants, he has given examples of it but in three different Flowers; yet he is of Opinion, that it generally belongs to all.

The Place he assigns to it in the *Digitalis*, and which, no doubt, he thought common to that with a great many other Plants, is the same with that observed by *Cæsalpinus*; for what *Malpighi* terms *prope floris umbilicum*, an Expression frequently to be met with in him, can mean nothing else than the *floris concameratio* of the other.

But nevertheless, to the Phænomena of this Liquor, taken notice of by *Cæsalpinus*, he has added two more; the first, that it is Transparent, and the second, that it is lodged in many Flowers, in a *Concha* or *Fovea*, *i. e.* a round or oblong Cavity, near the Origin of the *Petala*; and from whence perhaps, it flows out over all the Surface of the Calix. This Receptacle I am apt to think, is not always to be plainly discovered by the naked Eye, and as I have not as yet, viewed any Part of my *Lilly* through a Microscope, I cannot determine whether it be found there or not.

Cæsalpinus

Cæsalpinus has assigned one use this Liquor is designed for, *viz.* to supply the Bees with Materials for their Honey; but *Malpighi*, whose cautiousness in framing Hypotheses concerning the final Causes of Things, is not the least beautiful Part of his Character, has advanced nothing at all about it, but only that it is a wonderful appearance.

Dr. *Woodward* in a Memoire presented to the *Royal Society*, concerning Vegetation, which both for the accuracy of the Experiments it contains, and the justness of the Conclusions drawn from them, ought to be reckoned a Pattern and Standard for all Philosophical Enquiries, has endeavoured to account Mechanically for the Production of these Liquors, or Exsudations of Plants, but fixes no certain Receptacle for this we are now upon. It is certain from repeated Experiments he has made, that the far greatest Part of the Juices, that enter by the Roots of Plants, is transpired through the Pores of them; and as some Particles of this Matter may be so far attenuated and separated from one another, as to be specifically lighter than the Air, and so will mount up into the Atmosphere; so there may be other Parts of it so gross and heavy, as not to be able to reach any further than the Surface of that Part of the Plant, through which they transpired: They will consequently remain and settle there; and from such Particles condensed, it is very natural to think this and other such Liquors are formed. This Observation and Reasoning of the Doctor's, concerning the manner in which this Liquor is produced, is much more satisfactory than what either *Cæsalpinus* or *Malpighi* have told us about it; but however contradicts no part of what this last named Author has advanced.

The next in order of time, who has said any thing concerning this *Melleous Liquid* is Dr. *Blair*, and according to him it is a part of Plants of very great Importance in Vegetation. After observing from Mr. *Bradley* that there is a Glutinous Matter on the tops of the Styli, which may be capable of receiving and holding some part of the *farina fecundans*, as it falls from the *Apices*; he adds, I go so far in with Mr. *Bradley*, that I shall put him in mind of another Contrivance for that purpose, of which, I doubt not, he is already sensible, *viz.* of the *Pelvis*, so to call it, or Cistern, situated at the Root or Origin of each *Petalum*, filled with a viscuous Liquor which continues there, and never exceeds its bounds so long as the *Petalum* is in health; for since the *Apices* here are so artfully fixed, that they turn every way with the least Wind, as Mr. *Moreland* justly observes, when they burst and the *Farina* is driven to and fro, tho' it cannot so easily enter the narrow Tube, yet it may conveniently be blown up towards the Origin of the *Petala*, where it is stopped or stay'd by this Viscosity, till it has perform'd its office.

Mr. *Fairchild* being perswaded that this viscuous Liquor did some way or other contribute towards the fructifying of this Plant *viz.* the
Corona

Corona Imperialis; but not being sensible how it did it, try'd the Experiment of wiping it off, so soon as it was deposited in the *Pelvis*; and the Flower so served had no succeeding Fruit.

The way I account for that, is, the Humidity being removed, the *farina* is no sooner blown upwards, than it immediately falls down without furnishing any effect; and that which confirms this is, because both Tulips and Fritillaries frequently have this *Pelvis* or *Basin*, yet it is for the most part dry and empty, because their Flowers being erect, especially the former, they have no such need of this Liquor to retain the Dust; for the Rain having immediate access to them, may wash the Dust towards the Origin of the *Patala*, where it can remain till it has done its Work: Where as the Rain having no access to the inner Surface of the Flower of the *Corona Imperialis*, it is naturally endowed with this Humidity deposited there by several excretory Ducts, in order to render it fit for the Purpose. *Malpighi* takes notice of this Singularity in this Flower, but ascribes no such use to it.

In this Account there is nothing new concerning the Receptacle of this Liquor, for the *Pelvis* or *Cistern* mentioned in it, is undoubtedly *Malpighi's Concha*, only under a different Name; but concerning the Liquor itself, this Author has taken notice of several Things not to be met with elsewhere.

In the first Place he tells us, that it is Viscuous or Glutinous; and I always found it so in my Plants.

This Liquor, he says, never exceeds the Bounds of the *Pelvis*; while the Plant is in Health. With respect to the *Corona Imperialis* this, perhaps, may be true, but of all Plants it certainly is not, for I observed the contrary very often in my own.

Again, *Malpighi* talks of this Liquor as belonging to all Flowers without Exception; but according to *Dr. Blair*, erect Flowers are very often without it, and their *Pelvis* or *Concha*, may be perceived to be empty.

Lastly, the Use he ascribes to it is not only new, but very considerable; and Mr. *Fairchild's* Experiment, as well as the Observation he makes concerning erect Flowers, are so far Arguments for the Truth of it, as to make it at least deserve a further Enquiry. But I cannot help remarking, that if instead of confining this Viscuous Liquor to the Bounds of the *Conchæ*, he had taken notice of its being spread over the whole Surface of the Bottom of the Flower, his Hypothesis would have carried a further Air of Probability with it; especially after what we have heard from *Malpighi*, concerning the *Velabrum* or *Valve*, which we may suppose placed there not to keep the Liquor from flow-

ing out; but to hinder that or any thing else from without, to enter the *Concha*.

I come now to the learned *Pontedera*, who has explained both what I call the Basis or Umbilicus of Flowers, and the Liquor found upon the Surface of that, at greater length than has been done by any.

What he has told us concerning the first of these, I shall only take notice of as far as may be useful, in order to understand the second. *Voco Receptaculum*, says he, *Corpus quoddam figurâ dissimile atque varium, cui Stamina & petala semper adherent, & in quam tum apicum tum petalorum succus corrivari solet, ut a receptaculo sensim embryoni subministretur. Cum enim flos citissime perficiatur, atque mox contabescat, embryo autem non eâ celeritate evolvatur ut omnem apicum petalorumque Succum continere valeat, necessarium visum est, ut in parte aliquâ humor ille seponeretur, ex qua paulatim ad Embryonem transiret. Hac de Causa Receptaculum constitutum Credimus, ex cujus munere nomen imposuimus, quoniam ad hoc tempus parum a Botanicis excultum acceperamus, licet eximii usus, ut nos e multis difficultatibus expedire possimus. . . A Malpighio modo Zonam seu Circulum Stylum investientem modo dilatatam petioli substantiam, quæ folia & Stylum profert nominatum invenio.* The Author goes on to explain, by various Examples, two sorts of these *Receptacula*, the one *cui Embryo innascitur*, and the other *quod Embryoni imponitur*, but the Words I have quoted are sufficient for my Design, and from them it appears, that what in the *Guernsey Lilly* I have called the *Umbilicus*, this Author would have termed the *Receptaculum*; they agree exactly in Situation, and the *Petala* and *Stamina* arise from them both. At present, I am no further concerned with the use he assigns to it, than only that he supposes it a repository for Juice, conveyed thither from the other Parts of the Flower.

I agree with him, that the *Receptaculum* has been but very little taken notice of by Botanical Writers, by that or any other Name; but I am apt to think he has mistaken *Malpighi's* Meaning in the Expressions he quotes from him. That by the *Zona* and *Circulus Stylum ambiens*, is not to be understood the *Receptaculum*, is plain, because that is taken notice of by *Malpighi*, as being common but to very few Flowers, such as the *Been Albus*, &c. whereas this Author's *Receptaculum* is by him made an essential Part of every Flower, *Petalous* as well as *Apetalous* or *Stamineus*, since both *Petala* and *Stamina* always arise from it; and besides *Malpighi's Zona* makes a quite different appearance in the Figure he has given us of it, from what any of this Author's *Receptacula* do in his.

Much less can this *Receptaculum* be the *Dilatata Petioli substantia*; for besides the Reasons already mentioned, *Malpighi* makes the *Stylus*, as well as *Stamina*, arise from that Substance, and by his Figure it is plain, he means either what Botanists term the *Calix* or Cup of the Flower, as distinguished from the *Perianthium*, or else the *Vasculum Seminale*.

Had *Malpighi* ever considered this part of the Flower as distinct from the rest, it would most probably have been in the *Amygdalus*, the Figure of which this Author has borrowed from him to represent one kind of his *Receptacula*; but what he calls by that Name, *Malpighi* terms only *hians Calycis substantia*.

Thus far concerning the *Receptaculum*. As for the Liquor found upon it *Pontedera* tells us, *Hic succus qui in omnibus fere floribus reperitur, & quo plurima insecta Victitant apesque Mellificant, est ille liquor qui e receptaculo manat, & circa Embryonem colligitur eumque mollem servat & inungit, quo facilius Embryonis partes explicentur atque distendantur. Cum autem hic succus dulcis saporis sit, idcirco ab insectis avidius expetitur; Embryo autem hoc liquore privatus aere & solaribus radiis exsiccat, & saepe sine fructu contabescit.* All this our Author illustrates by several Examples, but I need only take notice of what he has observed concerning the *Bigonia Americana siliqua brevior* *Tournef.* *Inter flores & receptaculum*, says he, *Similiter inter receptaculum & Embryonem dulcis colligitur succus, qui ex hiantibus receptaculi utriculis effunditur, receptaculum succo refertum apparet & turgidum. Id circo cum neque receptaculum neque fructus pusillus, tantam liquoris copiam, quanta a tanto flore descendit, continere valeant, fit in transversales receptaculi utriculos a liquore impetus & foras spargitur. Hic succus qui inter Calycem delapso Petalo & receptaculum reperitur, ab ipso receptaculo rursus excipitur, qui vero inter receptaculum & embryonem, ab embryone.*

According to this Author, therefore, this Liquor is of a sweet Taste, and what the Bees employ in making their Honey, as was observed long ago by *Cæsalpinus*, but he has taken no notice of its being Transparent or Glutinous.

That Part of it, which he says lies between the *Receptaculum* and the *Petala*, is probably what *Malpighi* assigns to his *Conchæ*, of which its very surprising *Pontedera* has said nothing in this Place: The other Part of it is the same with what that Author says is contained, *prope floris Umbilicum* in the *Digitalis*.

Concerning the Nature and Situation of this Liquor therefore, *Pontedera* has told us nothing new.

What he has said concerning the Origin thereof, or the manner in which it is produced, is at best but a meer Conjecture, and that not near so probable as what we have seen from Dr. *Woodward*: For as *Malpighi*, after all the Pains he took, would never venture to determine, whither any part of the Sap, by which the tender Seed is nourished, was prepared before-hand in the *Petala* and *Stamina* or not; so there are other Authors of no small Note, who pretend to prove that there can be no such thing, but that all the Nourishment both of the *Embryo* its self, and all the other Parts of Flowers, are carried directly to them from the *Pedunculus*, or if they have none, from the common Stalk from whence they arise.

The Use assigned here for this Liquor, while it remains on any part of the surface of the *Receptaculum* is intirely new, and not without probability; and tho' it does not directly contradict that mentioned by Dr. *Blair*, yet it quite takes off the force of Mr. *Fairchild's* Experiment to prove it; because the wiping of it off from the Flower, may have another very different effect upon the Fruit, than merely the preventing its being facundated by the *Farina*, viz. the exposing of it too much to the action of the Sun and external Air, as this Author observes.

The way which he disposes of this Liquor when it has done all its work upon the surface of the *Receptaculum*, is, I believe, pretty much without Foundation; for as, without any breach of Charity, we may venture to affirm, that this Author never saw any Part of it re-enter either the *Receptaculum* or Seed Vessel, so it is much more likely to suppose that it evaporates into the Air; since that Part of it which he restores to the Seed, must be but very unfit Nourishment for it, after remaining so long exposed; and since the *Receptaculum* its self, in my Plants at least, began to decay not long after the *Petala*, it seems to have but little occasion for the other Part.

Since *Pontedera*, I meet with none but Dr. *Chambers* who have any thing that relates to this Subject. This Author concludes the brief Account he has given us of the *Petala* of Flowers, by the following Observation. *Sed etiam Conchulae sunt, seu Vesiculae parvae valvulis donatae, ad fundum petalorum, quarum singulae guttulam mellitae seu saccharinae Materiae continent. Haec vero in omnibus plantis Petalis donatis adsunt, imo & in amarissima Aloë florente, Liquor tam dulcis fit, quam in gratissima dulcissimaque planta.*
Hunc

Hunc vero liquorem apes floribus exugunt, secumque in alvearia sua portant, unde mel conficiunt.

In this Passage there are two Things said in more exprefs and positive Terms, than in other Authors; *First*, That no petalous Flower is without a *Concha* in each *Petalum*. And *secondly*, That the Liquor contained in these *Conchæ*, is as sweet in the bitterest Plants as in the sweetest.

CULTURA.

I Have already acquainted the Reader, that hitherto I have had no opportunity of examining the Culture of this Plant myself; but this defect will be abundantly supplied by the following Account, which I procured from the ingenious Mr. *Fairchild*, concerning his method of Managing it. The truth of every Thing contained in his Letter may be securely depended upon; for besides that, Mr. *Fairchild* has great numbers of these Lillies in his Gardens, in full Perfection, as proofs of the Genuineness of his method of Culture; he is so deservedly famous for his great Skill in all the parts of Gardening, that to him we are obliged for most of the considerable Improvements that have been made in that delightful Art for these several Years past; they being either intirely owing to himself, or he having assisted others in making them. Neither is his Art confined to what may be called the practice of Gardening only. It extends to the most refined Parts of the Theory of Vegetation; for it is but a very little while ago, that we had the Pleasure of having him communicate to the *Royal Society*, several Experiments equally new and conclusive, concerning the continual motion of the Sap in Plants. His Letter is to this Purpose.

S I R,

I Have here sent you an Account of the proper management of the Guernsay Lillies. They love a light Earth, made with Dung and Sand, and a little Lime Rubbish with it does very well; it keeps the Roots sound: For if the Earth be too stiff or wet, you may keep them many Years before they blow.

If they are in Pots, they should be put in the House in Winter, to keep them from the severe Frosts, which are

K

apt

apt to rot the Roots, for any Thing that is in a Pot freezes harder than in the natural Ground.

The Time of moving them is when they have no Leaves on the Root, that is from June to August.

Those that come with six Leaves this Year, seldom fail blowing the next Year.

They need not be put in fresh Earth not above once in two or three Years.

By this method of Management, I have had the same Roots blow again in four Year's Time; for as the Flower Stalk comes out of the middle of the Root, so when the green Leaves begin to shoot, which is always after the Flower; they always come up on one side of the Stalk, so as they come up, the Stalk becomes of one side of the Root, which plainly shows that there is a new Heart made in the middle of the Bulb, which is three or four Years before it hath Strength to blow.

For as the Tulip makes a new Bulb every Year, by the Circulation of the Juices that are in the Leaves and Flower Stalk, so by the Circulation of the Juices that are in the Leaves of this Plant, it makes a Bulb fit for blowing the third or fourth Year.

So I find many Miscarriages that happen in the Guernsay Lilly, are by letting the Leaves be killed by the fierceness of the Frost in Winter, or by cutting them off, as some People do, when they are green; which will so much weaken the Plants, that they may keep them twenty Years and not have them blow.

So by the above method of Management, where there is a Stock, there will be continually some Blowing.

I hope this Account may be acceptable from

Hoxton, October 21. 1724.

Thomas Fairchild.

To

To this Account of Mr. *Fairchild's* I shall subjoin two others from Monsieur *Liger* and Mr. *Bradley*.

This *Narcissus*, says *Liger*, like all the rest is multiplied by Bulbs, and is cultivated with more success in Pots, than in the naked Earth, because, if it be in Pots, it is easy to give it as much Sun, as it requires to produce its Flowers. These Pots should be filled with very light Earth; that is to say, two thirds of Mould, taken from a hot Bed, and the other third of Kitchen Garden Earth, well sifted. Having made this compost of Earth, and filled the Pots, we plant there in the bulbs of this *Narcissus*, two or three Inches deep, nor do we pull them up to take off the Suckers, till the second or third Year after, and always in the Month of *March*; having all along taken care, to keep the Pots in a Place where the Frost never enters, and that is not damp. We leave these Bulbs without watering them, from the Day they are planted, till the Month of *May*, taking care to keep them always in the warmest Place we can. When that Month is come we give them a plentiful wetting, by dipping the Pots into Water, and leaving it there, till the Water swims on the surface of the Earth that fills the Pot: After which we set it in the hottest Sun we can. After this first wetting, we are careful to water them as much as the Heats will permit, this we may not neglect to do, except the Weather be very Rainy. This Plant requires a warm Place, and delights to be where the Sun naturally darts down his fiercest Rays, for which Reason, except we are exact in ordering it according to the Method above presented, it will scarce ever give us a Flower worth the having.

Thus we govern the *Narcissus* of *Japan* till the Month of *October*, to oblige it to produce many Suckers, and beautiful Flowers in its Season. The following Year we do not, as I have said already, take up the chief Bulb, but only change the Earth, that lies over it, for other of the like Nature, and leave it thus till *May* without watering it. The third Year we pull up the Bulbs to take away the Suckers, that are grown about them.

Thus far Mr. *Liger*. Mr. *Bradley* tells us, that the Soil proper for this Plant, is two third Parts Sea Sand to one of natural Soil, or a light sandy Earth mixed with an equal quantity of Rubbish.

It will bear the Hardships of our Winters, if it be planted in either of the foregoing Soils, under a warm Wall, but chiefly if it be kept dry.

The Flower Stems of this Plant are commonly about a Foot high, the Off-sets will blow in about three or four Years after they are taken from the old Root.

The

The *Guernsay-Lilly*, says the same Author, has hardly its equal for Beauty among the flowering Race, and yet it is rarely found in our Gardens, which may perhaps be for want of a right knowledge of its Culture. Mr. *Fairchild* of *Hoxton*, has this Plant flowering with him every *Autumn*, even from Off-sets taken from the great Roots.

After this manner, according to the best Judges, is this charming Plant to be cultivated, and whoever will but give themselves the trouble to walk out to *Hoxton*, in the Months of *September* or *October*, and view it in Mr. *Fairchild's* Garden, in its full Prime and Beauty, will readily agree, that it richly deserves to be taken Pains about. This is what we in *England* ought to think our selves more particularly obliged to, than all the World besides: Nature assisted by the peculiar hand of Fortune, has blessed us with this Treasure without our asking for it, and the only suitable Return we can make, for so great a Happiness, is in perfecting by Art and Care, what she has so bountifully begun.

I therefore heartily invite all lovers of Flowers, to the Culture of the *Guernsay-Lilly*, the great Empress of the whole flowery World, I am sure, the noblest Plant that *England* can boast of; and I cannot do that better than in the Words of the famous *Rapin*, to which I shall annex the two *English* Translations that have been made of them. For what that Author says of *France*, may with a great deal more Justice be applied to *England*.

R A P I N.

*Vosque boni, vos illum hortis inducite crebrum,
Cultores, rarique novum decus addite Franco.*

E V E L Y N.

Therefore t'augment the Grace of *France* 'tis fit,
This Flower into our Gardens we admit.
'Tis true, it hardly answers our Desires
At first, but longer Culture still requires;
Yet, let not this occasion our Dispair,
When once it blows, 'twill recompense our Care.

GARDENER.

This Flower, ye skilful Florists, often Plant,
 Let not our Nation this fair Beauty want;
 And tho' she answers not your common Care,
 No cost or labour on her Dressing spare;
 For should she but her conquering Charms display,
 From every Fair she bears the Prize away.

EPILOGUS.

I cannot conclude this Description better than by a short recapitulation of it in *Latin*, which I have drawn up, *more Boerhaaviano*, that is, in the Stile and Manner used by the learned Professor *Boerhaave*, in his *Index Plantarum*, &c. *viz.*

R A D I X

Bulbosa, tunicata, seu ex multis candidis conflata pelliculis, sibi mutuo incumbentibus, & filamentorum transversalium interventu connexis.

Ventre rotundiore in Collum longiusculum attenuato.

Numerosis albisque fibris comata, a basi oriundis, & in fibrillas tenuiores laxatis.

Membranaceo involucro obducta & infuscata.

Perennis & vivax, singulis Annis Novas soboles emittens.

C A U L I S F L O R I G E R

Nudus, enodis ac lævis,

Ex rotundo pressior,

Duos circiter palmos altus.

Partim propriis, partim sibi cum foliis communibus tunicis involutus, rectus assurgit; postea vero, superbo florum ponderi cedere coactus, paulatim incurvatur.

Colore viridi nitens, inferiore autem sede ex viridi rubescens.

Fungosâ substantiâ quasi medullâ, oppletus,

Et Cortice duro ac forti munitus.

L

P E R I =

P E R I A N T H I U M

E Caulis summo utrinque productum,

Duabus membranis conflatum.

Colore Cinnabarino diluto.

*Tandem bifariam dehiscens, tenellos formosissimosque florum partus
excludit.*

P E D U N C U L I

Trigoni.

Subvirides.

Unum florem singuli in fastigio gerentes.

In orbem sive umbellam dispositi,

Et in latius continuo radiati.

P O L Y A N T H O S,

Seu floribus pluribus in coronam umbellatam speciosissimam congestis,

Liliaceis,

Hexapetalis,

*Deorsum, ad Lili Montani modum, quod Martagon vocant, paulu-
lim reflexis,*

Bimestri fere vitâ.

P E T A L A F L O R U M

Inodora.

Rubro versicolore eleganter variegata,

Micisque aureis ad solem pulcherrimè splendentia.

Oris mucronem versus, leviter undulatis;

Mediâ, intus, regione, sulco quasi perfossâ,

Extra, costulâ prominente suffultâ;

Imâ parte in unguem brevem & Albicantem desinente.

*A Floris Umbilico, sive basi spongiosa, candida, melleumque exsu-
dante liquorem, unâ cum staminibus, emergentia.*

S T A M I N A,

Sive Vasa seminalia masculina, sena, sibi invicem contigua, & Stylum circumamplexa.

Cylindrica, superiore autem parte in Conum vergentia.

Colore pallidius rubente.

Apicibus totidem,

Versatilibus,

Atropurpureis,

Bivalvibus,

Farina fecundante Onustis, instructa.

S T Y L U S

Principio trifido ab Ovarii Loculis emergens.

Staminibus productior.

Concolor.

In Cuspidem triangularem, pilis seu villis obsitum, abiens.

V A S C U L U M S E M I N A L E

Tricapsulare, seu in tria loculamenta divisum.

Polyspermum, multis minutissimis, subrotundis, albisque seminum rudimentis fetum,

Quæ floribus elapsis, in plagis hisce Borealibus, cum Caule emarcescunt.

F O L I A

Narcissinorum æmula.

Viridia & glabra, in Apice retusa.

Externe convexa, interius concava.

Palmari longitudine, latitudine unciali.

E radice fundo, seu basi conum obtusum referente, a latere Caulis; serius autem erumpentia.

Pleraque erecta, nonnulla humi procumbentia.

A D D E N

A D D E N D A.

Since the printing off of the foregoing Sheets, I have met with two other Books in which the *Guernsey Lilly* is mentioned, and both of them in *English*.

The first is called *Kalendarium Hortense: Or, the Gardiner's Almanack*. By *John Evelyn, Esq; F. R. S.* and contains some Observations concerning the Culture of this Plant. Of this Book there have been at least nine Editions; the first, *London 1664.* in Folio, and the Ninth in 1699. in Twelves. These two Editions, together with the Third, in 1669. Folio, I have seen; and all of them differ in some Particulars, from one another.

In the First, *p. 65.* talking of the Gardiner's Work, during the Month of *April*, he says, Now take out your *Indian Tuberoses*, parting the Off-sets (but with Care, lest you break their Fangs) then pot them in Natural, not forced Earth; a Layer of rich Mould beneath and above this natural Earth to nourish the Fibres, but not so as to touch the Bulbs: Then plunge your Pots in a hot Bed temperately warm, and give them no Water 'till they spring, and then set them under a South Wall: In dry Weather, water them freely, and expect an incomparable Flower in *August*. Thus likewise treat the *Narcissus of Japan*, or *Guernsey Lilly* for a later Flower, and make much of this precious Direction.

In the Month of *June*, plant your *Narcissus of Japan* (that rare Flower) in Pots, &c.

In *September*, the Flowers of the *Guernsey Lilly*, or *Narcissus of Japan*, are in their Prime.

And in a Catalogue of Plants, which according to their different Nature, require more or less Indulgence, he ranks the *Narcissus of Japan* among such as endure the second degree of Cold, and which are accordingly to be secured in the Conservatory.

In the third Edition, *p. 15.* to the Directions for *April*, he adds, that this nice Curiosity (the *Guernsey Lilly*) set only in a warm Corner, exposed to the South, without any removal at all for many Years, has sometimes prospered better.

In *June*, instead of Planting, he orders the *Narcissus of Japan* to be watered in Pots.

In the ninth Edition, *p.* 52. he tells us, that Sea Sand, mingled with the Mould more plentifully towards the Surface, exceedingly contributes to the flourishing of this rare Exotick. All the rest is as in the Third.

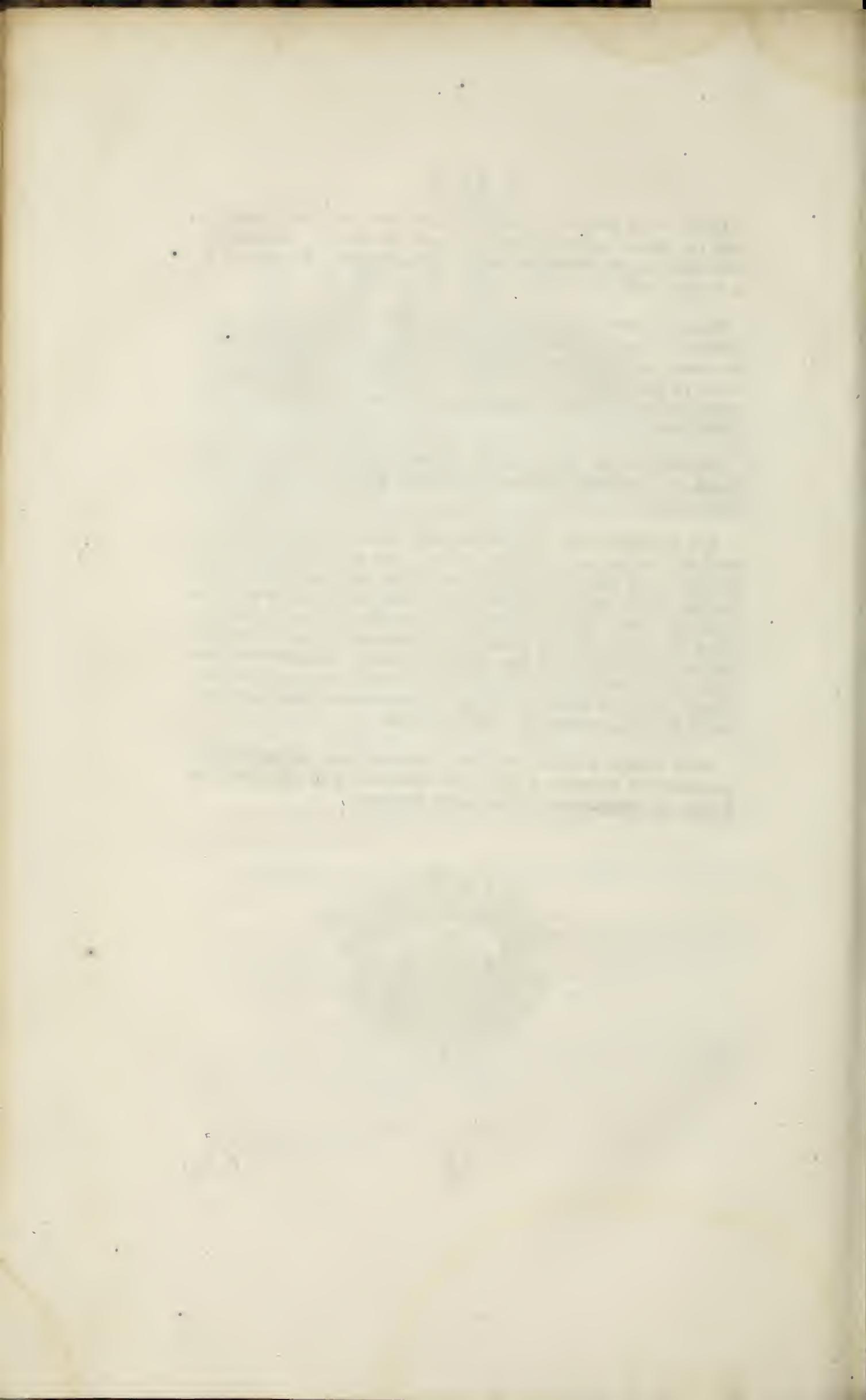
What deserves chiefly to be remarked about all that we have quoted from this Author, is that he is the first who has given any Directions about the Culture of this Plant in *English*, or called it by the Name of the *Guernsey Lilly*; for which, not having then seen his Book, I have in the Introduction and Names, by mistake, cited *John Rea*.

The other Book is the *Lady's Recreation, or the Pleasure and Profit of Gardening improved*. By Charles Evelyn, *Esq;* Lond. 1707. 8vo.

The *Guernsey Lilly*, is by this Author, called the *Lilly of Japan*: And he tells us, *p.* 120. that this is a rare and curious Exotick, yielding a fair branch of Flowers, not unlike the *Martagons*. And the Sun has so great an Influence over these Flowers, that when it shines on them, the whole Flower seems changed, and resembles Cloth of Gold: But the Root never produces any more Flowers after once blowing. He has annexed likewise a *Kalendarium Hortense* of the same Nature, and I believe, pretty much in the same Words with that already mentioned; but without giving any particular Directions about his *Lilly of Japan*.

What he here says, that the Root never produces any more Flowers after once blowing, is false. Mr. *Fairchild* in his large Stock of Roots, has Instances every Year of the contrary.





E R R A T A.

<p>In the Catalogue of Authors. For <i>Pariensis</i> read <i>Parisiensis</i></p> <p style="text-align: center;">In the Introduction.</p> <p>Page 4. <i>some Letters</i> r. <i>a Letter</i> Ib. <i>This Aldinus</i> r. <i>This, Aldinus</i></p> <p style="text-align: center;">In the Description.</p> <p>Page 4. <i>Sen</i> r. <i>Seu</i> P. 6. <i>Dramch</i> r. <i>Drachm</i> P. 7. <i>substance. of</i> r. <i>substance, of</i> Ib. <i>ragged, they</i> r. <i>ragged. They</i> Ib. <i>than the</i> r. <i>than in the</i> P. 8. <i>it as</i> r. <i>as it</i> P. 9. <i>soft the</i> r. <i>soft to the</i> Ib. <i>there other</i> r. <i>there are other</i> P. 12. <i>arising</i> r. <i>arise</i></p>	<p>Ib. <i>congerics</i> r. <i>congeries</i> P. 19. <i>three Inches and one eighth</i> <i>Part</i> r. <i>three eighth Parts of</i> <i>an Inch</i> P. 21. <i>Semiconere</i> r. <i>Semiconcreto</i> Ib. <i>forvea</i> r. <i>fovea</i> Ib. <i>Calix</i> r. <i>Umbilicus</i> P. 23. <i>Basin</i> r. <i>Bason</i></p> <p style="text-align: center;">Dissection of the Coffee Berry.</p> <p>P. 5. <i>greatest of</i> r. <i>greatest part of</i> P. 6. <i>Camboidge</i> r. <i>Cambridge</i> P. 19. <i>time they</i> r. <i>time as they</i></p> <p style="text-align: center;">In the Title mentioned after the Advertisement.</p> <p>For <i>Muscles.</i> r. <i>Muscles,</i></p>
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BOOKS sold by G. STRAHAN, at the Golden Ball,
over against the Royal Exchange in Cornhill.

M*Tographiæ Comparatæ Specimen: Or, a Comparative Description of all the Muscles in a Man and in a Quadruped. Shewing their Discoverer, Origin, Progress, Insertion, Use and Difference. To which is added, an Account of the Muscles peculiar to a Woman. With an Etymological Table and several useful Index's. By James Douglass, M. D. F. R. S.*

Bibliographiæ Anatomicæ Specimen, sive Catalogus Omnium Pene Auctorum qui ab Hippocrate ad Harveam Rem Anatomicam professo, vel Obiter, Scriptis Illustrarunt; opera Singulorum & Inventa juxta Temporum seriem complectens: Cura & Studio Jacobi Douglass, M. D. R. S. S.

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A

Botanical Dissection

OF THE

COFFEE BERRY.

Read and demonstrated on several Preparations,
at a Meeting of the

ROYAL SOCIETY,

March 18. 1724-5.

THE
COLLEGE OF
LIBRARIANS
OF THE
UNIVERSITY OF
TORONTO



P R E F A C E .

THE earliest Accounts that European Travellers have given us, of the use of the Coffee-drink in the Turkish Dominions, contain likewise some more, some less exact Accounts of the Fruit with which that Liquor is prepared. And ever since it has been commonly known in Europe, especially in England and France, Botanical Writers have endeavour'd to add new Observations about it, to those which are to be found in the Books of Travellers.

Of these in general, we may distinguish two Kinds; such as were made before the Coffee Tree its self, by the Care and Industry of the Dutch, found its way to the Amsterdam Gardens, and from thence, as from a common Nursery, to many other Places in Europe; and such as have been made since that Time.

These last, as we may easily conceive, are the most Exact, as well as the most Compleat; but after all that has been said, the Subject is very far from being exhausted: There is still room left for further Inquiries. And as I have lately thought it worth while to carry these as far as I am capable of, or have hitherto had an opportunity of doing; I am now to lay before this honourable Society, the result of the Pains I have been at, in the following Method.

I shall begin by a List of the Synonyma, or different Names that have been given to the Coffee Fruit. These I
 N have

have taken care to distinguish from such as are peculiar either to the Tree or Liquor ; a Thing seldom or never attended to by Botanical Writers.

I shall in the next Place, set down such Observations, as I think, do belong to the Coffee Fruit in General.

Under the third Head, I shall describe the Involucra or Coverings of it.

Under the Fourth, the Nucleus or Kernel.

And last of all, the PLANTA SEMINALIS, or true Seed, as far as it is discoverable by the naked Eye.

To my own Observations concerning each of these Particulars, I have taken the Liberty to subjoyn some short Historical Remarks upon all that has been hitherto said about them, both by Travellers and Botanists, whom I have consulted. A Catalogue of their Names, together with the Years in which their Books were published, the Reader will find annexed to this Introduction.

The Coffee Tree being now Cultivated, not only in the Physick Garden at Amsterdam, at Paris, and in many other Places in Europe, as I have already observed ; but also by some curious Gentlemen in our own Country, with good Success ; I am preparing an exact Description thereof, together with the History of the use of Coffee both in Asia and Europe, and the different Methods of preparing that Liquor ; ever since the first discovery of it to the present Time.

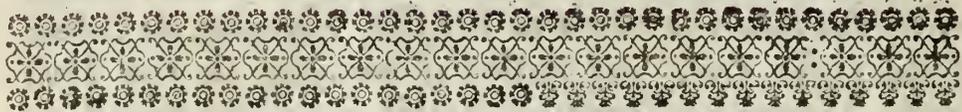
This Design I intend to prosecute in the same Method which I have here followed in describing the dried Fruit, and this, I desire, may be looked upon as a Specimen of the whole, which shall speedily follow, whenever I have been able to compleat the necessary Observations I am actually employed in making, upon the growing Plant.

I have

I have this further to acquaint the Reader with, that as nothing has hitherto appear'd in English, concerning the Culture of the Coffee Tree, and method of managing the ripe Fruit in the Kingdom of Yemen in Arabia Felix (its original and native Place of growth) except some short Observations communicated by our most learned and worthy President, Sir Hans Sloane; I think it will not be an improper Appendix to my Description of the Coffee Fruit, if I subjoin to these, a late Account, publish'd in French by Monsieur La Roque, from Memoires furnished him by Persons who travelled over a great part of that Country.

And as the Fraud or Management imputed to the Arabians of spoiling the Germinative Faculty of the Coffee Fruit, before they suffer it to be Exported, is supposed to be put in practice while they are drying and preparing it: The History of this naturally led me to examine the grounds of that Accusation, and the Sentiments of Botanical Writers about it.





NOMINA AUCTORUM.

C arolus Clusius.	1574	Joh. Jacobus Berlu.	1693
Leonhartus Rauwolfius.		Johannes Pechey.	1694
	1583	Petrus Pomet.	1694
Prosper Alpinus.	1592	Hans Sloane.	1694
Johannes Gerardus.	1597	— Galand.	1696
Johannes Cotovicus.	1598	Jacobus Vanierus.	1696
Casparus Bauhinus.	1623	Nicolaus Lemery.	1698
Thomas Johnson.	1636	Johannes Houghton.	1699
Johannes Veslingius.	1638	— Du Mont.	1699
Johannes Parkinson.	1640	Ludovicus Lemery.	1702
Johannes Bauhinus.	1650	Jo. Christianus Langius.	1704
Gualtherus Rumsfy.	1657	Paulus Hermannus.	1710
Petrus de la Valle.	1670	Jo. Baptista Chomel.	1712
Anonymus Gallus.	1671	Nicolaus Andry.	1713
Faustus Nairon Banesius.	1671	Jo. Christophorus Volkamerus.	1714
Henricus Mundy.	1680	— De Jussieu.	1715
Nehemias Grew.	1682	— La Roque.	1716
— Bernier.	1683	Mich. Bern. Valentini.	1716
Phil. Sylvester du Four.	1683	Jos. Pitton Tournefort.	1717
Nicolaus Blegny.	1687	Johannes Quincy.	1718
Tancredus Robinson.	1687	Adamus Olearius.	1719
Johannes Ray.	1688	Richardus Bradley.	1721
Claudius Salmasius.	1689	Josephus Miller.	1722



A

BOTANICAL DISSECTION
OF THE
COFFEE BERRY.

NOMINA.

<i>Bunna</i>	⋮	
<i>Buncho Avic.</i>	⋮	Rauwolf.
<i>Buncha Rhaz.</i>	⋮	
<i>Bon vel Ban.</i>		Alpin.
<i>Buna</i>	⋮	
<i>Elcane</i>	⋮	Clus.
<i>Bunca Rhaz. ex Rauwolf.</i>	⋮	
<i>Cabu</i>	⋮	Cotovic.
<i>Bunchi.</i>	⋮	
	○	<i>Bunchos</i>

<i>Bunchos</i>		
<i>Bunnum Rauwolf.</i>		J. B.
<i>Granum quo Turcæ somnum fugant, Pläter.</i>		
<i>Cabué.</i>		La Valle.
<i>Coffee</i>		
<i>Cophie</i>		Rumsey.
<i>Copby.</i>		
<i>Coffé.</i>		Anon. Gall.
<i>Ben. & Bun.</i>		Banef.
<i>Elcave.</i>		Salmaf.
<i>Coffee Berry.</i>		Grew.
<i>Coffa.</i>		Mundy.
<i>Café.</i>		Bernier.
<i>Caboch Arab.</i>	}	
<i>Cabuch Turcar.</i>	}	Du Four.
<i>Baccæ Coffee</i>	}	
<i>Coko Seeds.</i>	}	Berlu.
<i>Coffee, in Latin Coava.</i>		Pechey.
<i>Bonca Bonco</i>	}	
<i>Elkarie.</i>	}	Pomet.
<i>Semen Coffee.</i>		Herman.
		<i>Bun.</i>

<i>Bunn.</i>	Galand.
<i>Terris faba missa Pelasgis.</i>	Vanier.
<i>Coffi.</i>	N. Lemer.
<i>Cafféé Behnen.</i>	Lang.
<i>Caboven.</i>	Volkam.
<i>Cofea.</i>	Quincy.

Of the COFFEE FRUIT in general.

THE Tree which produceth this Fruit, has gone by as many Names as the Fruit its self. The consideration of the Flower was what principally led the learned *Commelinus* to call it a Jessiman, and in this he has been generally followed by succeeding Writers. It does not belong to my present Design, to determine how far they have been in the right in so doing, and the Question its self is of too small Moment, to deserve a Digression. The following Appellation, by which I have chosen to distinguish the Coffee Tree, I look upon to be as proper to it, as any that can be given it.

Arbor Arabica Yemensis,
perpetuâ fronde Virens.

Folio Lauri Vulgaris haud absimili.

Flore Jasmini Hispanici,
Monopetalo, in quinque segmenta diviso,
Albo,
Odoratissimo.

Vasculo seminali, ut plurimum, bicapsulari, nonnunquam tricapsulari, in fructum Nuciformem Abeunte. Ex cujus Nucleis, potus ille Saluberrimus, Coffee vulgo dictus, paratur.

In this short Description, I have expressed the Original *Locus Natalis*, or native Soil of the Coffee Tree, *viz.* the Kingdom of *Yemen* in *Arabia Felix*; That it is of the number of the Ever-greens; its Leaves like those of the Common Bay; its Flower resembling that of the *Spanish Jasmin*; the structure of the Seed Vessel; and the use that is made of the Fruit.

As

As for the fresh Fruit of the Coffee Tree, I must refer intirely to what *Messrs. De Jussieu, Volkamerus, La Roque, Bradley,* and others have said about it. I have not as yet been so lucky as to be able to examine it with due Care my self; and therefore can have nothing material to add about its appearance in that State.

Neither is the dried Fruit to be often met with intire here in *London*: A great many such, however, I have been at Pains to pick out of Bales of Raw Coffee at the Drugsters; and some of them I found to contain two perfect Kernels in one common Husk, others only one; I say perfect Kernels, because even in those that are single, there are most commonly, if not always, some remains of the abortive Kernel, lying like a *Clipeus* or Target upon the other, as shall be explained more particularly in its proper Place.

The Number of intire single Berries in each Bale, does always far exceed the double ones: At a medium of all the Trials I made, the Proportion of them was nearly as seven to one.

The Reason why we have any intire Berries at all Imported, can be no other, than their being smaller than the rest, and so escaping the Roller which the *Arabians* make use of to take off the Husks, in the Manner we shall see presently; and as there are fewer double Berries of that small Size than single ones, a greater Number of these last must remain (after this Preparation) with the Husks on.

The single and double Berries differ from one an other in Figure; neither are all of each Kind exactly alike: The first are mostly of an oblong oval Figure, except where the Prominence, formed by the abortive Kernel makes a small Variation; the others, especially the smaller sort, are more nearly round, with a sensible depresso on both Sides, running from the Foot-stalk to the *Umbilicus*; and by this it may be easily known, whether a Berry be single or double, without taking off the Husk.

The single Berries which I collected, may with respect to their Sizes, all be distinguished into three Sorts, and the Length, transverse Circumference, and Weight of each Sort at a Medium, are as follows.

<p style="text-align: center;"><i>Largest Sort.</i></p> <p>Length, half an Inch. Circumference, one Inch. Weight, five Grains.</p> <p style="text-align: center;"><i>Second Sort.</i></p> <p>Length seven sixteenths of an Inch.</p>	<p>Cir. thirteen sixteenths of an Inch. Weight, three Grains and an half,</p> <p style="text-align: center;"><i>Least Sort.</i></p> <p>Length, a quarter of an Inch. Circum. five eighths of an Inch. Weight, one Grain.</p>
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The

The double Berries I distinguished into two Sorts only, and the Dimensions and Weight were these.

Largest Sort.

Length, three eighths of an Inch.
Circumf. one Inch and one eighth.
Weight, four Grains.

Least Sort.

Length, one quarter of an Inch.
Cir. eleven sixteenths of an Inch.
Weight, seven eighths of a Grain.

By this it appears that the double Berries that are imported intire, may as easily miss the Roller as the single ones.

The first Author, by whom I find the Coffee Fruit so much as mentioned, is *Rauwolfius*, who was in the *Levant* in the Year 1573, and what he has said, with relation to our present Subject, is only, that both in Bigness and Shape, the Coffee Fruit is like the Bay Berry. This Comparison has been often used, and with respect to the intire Berries, such as they are found commonly in the *Levant*, is, I believe, pretty just; but the far greatest of those that are imported hither, are considerably smaller.

Next to *Rauwolfius* is *Prosper Alpinus*, who was in *Egypt* in 1580. he has said but very little concerning the description of the Fruit; neither is it certain whether he means the intire Fruit, or only the Kernel.

The first Coffee Fruit that ever I hear to have been in *Europe*, was sent to *Clusius* by *Alphonsus Pancius*, an *Italian* Physician; and *Clusius* has observ'd about it, that it is a small Fruit, something bigger, and more oblong than that of the *Fagara*, with a kind of *Sulcus* running lengthwise on both sides of it.

This Author had another present of these Seeds in 1596. from *Honorius Bellus*, who was at that time in the Island of *Crete*.

Gerrard has done nothing but copy *Clusius's* Figures, which he has placed by mistake, amongst the *Indian* Fruits. *Johnson*, in his Edition of *Gerrard*, has added *Clusius's* Text to his Figures.

Before the Year 1613. the Coffee Fruit was in the Hands of most of the curious Botanists in *Europe*, for *J. B.* who died

in that Year, mentions his Friends having sent him some of them from all Quarters; and the Account he has given us of the Fruit in general is, that it is hardly bigger than the Seeds of *Ricinus*, of the shape of an Olive, with a *Sulcus* or *Lacuna* sometimes on one Side and sometimes on both. By this last, however, we are only to understand that the Depressure is not always alike perceivable on both sides of the Fruit.

Petrus de la Valle, who was at *Constantinople* in 1615, has observed nothing that belongs to this Head, save only that the Grains of which Coffee is made, are of an oval Figure, and about the bigness of a small Olive.

Olearius, Secretary to the *Holstein* Embassy, sent into *Persia* in the Year 1633. compares the size of the Coffee Fruit to that of a small Bean.

According to *Parkinson*, the Coffee Fruit is somewhat bigger than a Hazel Nut, and longer; round also and pointed at one End, furrowed also on both Sides, yet on one Side more conspicuously than the other. These Words show plainly enough, that *Parkinson* had seen the Coffee Fruit, but withal that he had been at very little Pains to examine it.

Banefius, the first Author who ever published a Treatise expressly on Coffee, tells us, that the intire Fruit is somewhat like the Cacao, but cleft along the Middle like a Date-stone.

The Comparisons by which the three last mentioned Authors have endeavoured to explain the Size or Figure of the Coffee Fruit, are, all of them, very ill chosen.

P

What

What Dr. *Tancr. Robinson*, in his Letter to Mr. *Ray*, has told us that the intire Fruit is round on one Side and flat on the other, is what I never could observe in any that I have looked upon.

There is nothing but Repetitions to be found in any other Author before the Year 1694. in which Sir *Hans Sloane*, amongst a great many other Observations, equally Curious and New, concerning all parts of the Coffee Tree, the Flower alone excepted, communicated by him to the Royal Society, has added to all that had been said before him, that the Fruit comes out *ex Alis foliorum*, hanging or sticking to the Twigs by Inch long Strings or Foot stalks, and sometimes one, two, or more at the same Place. All this has been since confirmed by Mon. *De Jussieu*, *La Roque*, &c.

Both *Lemerys* tell us, that this is a small longish Fruit, round like a *Pignon* (which I suppose to be the Seed of the *Ricinus Americanus*.)

I cannot conceive how the Coffee Plant escaped Monsieur *Tournefort* in all the Works published in his Life-time, even after he was returned from the *Levant*; and its being mentioned and described in that Treatise, concerning the *Materia Medica*, published as a posthumous Work of his, may perhaps be one good Argument to prove it is not Genuine.

It appears by Monsieur *Tournefort's* Travels, that he was no Enemy to Coffee, but drank it frequently, otherwise it might have been thought, that he left it out of all his Books, for the same reason that the Author of a *Latin Dictionary*, printed at *Cambridge*, is said to have omitted all the Words by which Monarchy is expressed, namely, because he hated the Thing its self.

Monsieur *De Jussieu*, in his excellent History of the Coffee Tree, read in the *French Royal Academy* in 1715. but published in the *Memoires* of 1713. informs us, from his own Observations on a Coffee Tree, in the Royal Garden at *Paris*, That the *Embryo*, or young Fruit, grows nearly to the bigness of a Heart Cherry, and is pretty much of the same Figure with it; but that when it is perfectly ripe and dry, it is reduc'd to the size of a Laurel Berry.

We are obliged to Monsieur *La Roque* for another very accurate account of the Coffee Tree. The Materials of it he received from the Officers of some *French Ships*, who travelled over a great part of the Kingdom of *Yemen* in *Arabia Felix*, and Monsieur *De Jussieu* had likewise some Informations from the same Persons, from which he composed a *Memoire*, read in the Royal Academy in 1713, but having had an opportunity of examining the Coffee Tree himself, before the History of that Year was published, he drew up another Description of it already mentioned, which was inserted in the Room of the First.

But to return to Monsieur *La Roque*, he acquaints us that to every Flower succeeds a small Fruit, but which by degrees grows to the Size of a large Cherry, in which State it is very good to eat. It adheres to the Tree by a small short Foot Stalk, and when perfectly ripe, is not much bigger than a Laurel Berry. The Fruit comes out between the Leaves and Branches, *i. e.* as we have heard from Sir *Hans Sloan*, *ex Alis foliorum*.

Mr. *Bradley*, it seems, had neither seen *De Jussieu's* nor *La Roque's* *Memoires*, tho' published six Years before he undertook to write upon Coffee, neither has he examined the Coffee Fruit in the *Amsterdam Garden*, with all the Care that could have been wished; of this, we shall give some Instances as we go along: As to our present Subject, he has only remark'd, that when the Fruit is ripe, it resembles the Berries of the *Lauro-Cerasus*, or Bay Cherry, being much of the same Shape.

To Mr. *Bradley*, we may join Mr. *Joseph Miller*, who has been as negligent in consulting the Authors upon this Subject, as the other in observing the Fruit itself upon the Tree; for about the Fruit in general, he contents himself with telling us, that in the Coffee Shrubby Tree, the Flowers are succeeded by Berries.

These are the Observations that have been made by Authors concerning the Coffee Fruit, in the View in which I have here considered it. I have only one Remark more to make about them, and that is, that generally speaking, they allow

allow two Kernels to each Fruit without Exception. There is indeed some Reason to imagine, that *I. B.* has described a single Berry only, as we shall see presently; Dr. *Robinson* says expressly that there are generally, in every Shell or Husk, two Kernels, and sometimes only one; and the Author of *Tournefort's* Posthumous Treatise, that there is generally but one Kernel, and sometimes two. The first is true with Respect to all the Coffee Fruit; the other with Respect to those that come to us intire.

The Coverings of the COFFEE FRUIT.

IN an intire Coffee Fruit we may consider the *Involucra* or Coverings, and *Nuclei* or Kernels, which are wrapt up and inclosed by them.

The number of the *Involucra* is always Three; one common to both Kernels, and two proper to each of them.

The common or outermost Covering is, as we shall hear presently from those who have examined the fresh Fruit, only the green or reddish, soft pulpy Substance or *Pericarpium*, hardened and dried up, as the Fruit ripens. In this the Seed was formed, and it was then truly and properly the Seed Vessel or *Uterus*, as *Malpighi* loves to talk.

In some Berries it is very much shrivel'd, wrinkly, uneven, and as it were furrowed; of a blackish or dark brown Colour. In others, especially the double Berries, it is smoother, and of a lighter shining Brown, but of different Degrees.

The upper extremity of this Covering, or that which is opposite to the Foot Stalk (some part of which I have often found sticking to it) terminates in an *Umbilicus*, as it is called by *De Jussieu*, which looks as if a small circular Impression had been made upon it, with a pretty deep Hole in the Centre thereof.

Upon boiling or long steeping in Water, this Coat becomes so soft, that it may easily be scrap'd off, but if macerated only a little while, it grows thick, and may be taken off quite, if cut into two equal Parts: And by so doing, I have observed that in many Berries it is considerably thicker near the *Umbilicus* than in any other Part.

I have already observed that this Coat is formed of the Seed Vessel of the Flower, and I can certainly affirm, that that is always Multicapsular, being divided generally into two Cells or *Loculamenta*, as Botanists express it, and sometimes, (as far as I can judge,
by

by the figure of some Kernels, and one fresh Berry which I have seen) into Three.

Neither *Malpighi* nor Dr. *Grew* have explained distinctly enough the Nature and Formation of the *Septa* or Partitions of the Seed Vessels of Plants, and none of those who have had opportunities of examining the fresh Coffee Fruit, in all its different States, have so much as mentioned any *Septum* belonging to it.

It is however very apparent, even in dry Berries, and then it seems to be a thin fine Membrane, of a different Substance from the outer Coat, and dividing the Cavity of it into equal Parts, in each of which is lodg'd one Kernel, involved in its two proper Coverings. Through the middle of it, lengthwise, runs a Bunch, or *fasciculus* of ligneous Fibres, continued probably from the Foot Stalk, and serving to convey some part of the Nourishment to the tender *Fœtus*.

In examining the outer Coverings of some Berries, I have been often inclined to believe, that the whole Cavity of them was lin'd with an inner Membrane, really distinct from the pulpy part of the Coat; and perhaps, this *Septum* may be only an Elongation or Production thereof, continued on both sides to the *fasciculus* of Fibres already mentioned: But, which ever way it is formed, as it adheres inseparably to these Fibres, it has all the properties of a true Partition, and therefore the Seed Vessel its self, is unquestionably Multicapular.

In those I have, for distinctions sake, called single Berries, this *Septum* is still to be seen, between the abortive Kernel and the other; but then it no longer occupies the middle of the Cavity, but is thrust out of its Place, and by that means very much impaired.

The second Covering or first of the proper Coats, may be truly reckoned a *Cortex* or Shell, being very strong and hard, but withal very brittle. I am surprized, that they who contend that the Coffee Fruit is of the Nut-kind, as distinguished from a Berry, have not made use of this Coat to prove it. The Difficulty its self is a mere trifling about Words, the signification of the words Nut and Berry, and the distinction of these two kinds of Fruits being, as far as I can find, hitherto unsettled amongst Botanists.

This being a proper Coat, it must either be continued over the *Sulcus* or *Rima* in each Kernel, or terminate at both Sides somewhere on the Edges of it: which of these is true in fact, I cannot with any certainty determine; I am apt to imagine the last, and that

that therefore by means of this *Sulcus*, the Fibres in the *Septum*, always placed opposite to it, may have some Communication with the Kernel its self, or at least with the inner Covering of it.

The Colour of this second or Cortical Coat, is mostly that of a Lemon, only a little more inclined to red, and the figure of it is always the same with the Kernel it incloses.

The third or innermost Covering, which, because of its Colour, may be called the Silver Coat, is made up of a very fine thin Membrane, surrounding not only the out-side of the Kernel, but also the Process, which lies in the Cavity of it, as shall be presently shown. The two sides of it enter the *Sulcus* of the Kernel, and there joyning form a double *Lamina*, which is from thence continued quite over the Process, and to that, as well as to the rest of the Kernel, this Coat adheres very close.

I have never been able to distinguish either of these Coats in an abortive Kernel.

Rauwolfius acquaints us that the Coffee Fruit (*i. e.* the common Covering of it) is in Colour almost like unto a Bay Berry, and that the Fruit its self is surrounded with two thin Shells, which contain two Grains in two distinct Cells.

The two Shells here mentioned, are no doubt the common, and first of the proper Coats, which are all that have been taken notice of by any Writer since his Time. What he has said about the two Cells, is very indistinct, and yet it is more than has been said by any body besides.

Clusius has taken notice of the outer Coat only; he calls it a thin *Cortex*, of a dark Ash Colour.

J. B. has described the other likewise. The Fruit called *Buna*, says he, consists of two Shells whereof the outermost is thick and black; the other thin, and red on that side which lies next the Kernel; on the upper side of an Ash Colour.

Veslingius informs us of the Difference he had observed in *Egypt*, between the Taste of the Coverings, and that of the Kernel. The first, he says, is in some degree acid, the other very sensibly bitter. The first of these Tastes we need not be very solicitous about, for in however great request the Shells may be in *Arabia*

and *Egypt*, on account of the Liquor there made of them, called, by way of Excellency, *Cafe a la Sultane*; yet, but a small quantity of them ever comes to *Europe*, and before they get hither they have pretty much lost their Taste, and every other sensible Quality that is worth minding about them.

Parkinson tells us the outer Coat is a thin Shell of a darkish Ash Colour, and the other he calls a yellowish Skin.

Banefius has included all the Coverings he knew, under the name of a Shell or Husk.

Dr. Grew has said nothing about the Coverings of the Coffee Fruit in particular, but since, as we shall find presently, he had examined it very particularly, and has often declared, that in the fir greatest part of Seeds there were three Coverings; it is reasonable to suppose that all those which I have described were known to him.

Dr. Robinson, in order to prove that the Coffee Fruit is of the Nut kind, informs us, that the intire Fruit is covered with two Skins: The exterior Skin or rather Shell (being as thick almost as that of a *Pistachio*) is of a dark Colour; the second, or interior Membrane, that covers the Kernels, is much finer and of a yellowish white Colour.

Under this second Skin lye generally two Kernels, sometimes one.

I shall be very far from denying, but that the greatest part of this Description was the result of the Author's own Observations, tho' at the same time it is certain, that every particular in it had been taken notice of long before the Date of his Letter, by Authors, whom perhaps, he did not give himself the trouble to consult; and even the principal Proposition which all his Letter is design'd to prove, *viz.* that the Coffee Fruit is of the Nut-kind, is a Conclusion, that, according to the common use of Language, might easily have been drawn from Premises as old as *J. B.* and *Parkinson*; for it was very natural to infer, that a Fruit which consists only of a *Nucleus* or Kernel, and Shell, as these Authors have expressed themselves, was rather of the Nut kind than any other.

What part of this Nut ought to be reckoned the Kernel, is not hard to determine: As for the Shell, I have already taken notice, that the first of the proper Coats seems best to answer that; our Author has chosen the common or outer Coat, and he is in the right to say, it is almost as thick as that of the *Pistachoe*; but then, if I am not mistaken, it is not by virtue of that outer Coat, that the *Pistachoe* is called a Nut, but on account of a hard Shell that lies under it, to which the outer Coat of the Coffee Fruit has no resemblance, neither in Substance nor Situation.

By what this Author says further, that under the second thin Skin, lye generally two Kernels, it would seem that he looked upon it, not as a proper, but a common Coat, as much as the other; but how this can be, I do not so well understand, since not only each Kernel in particular is quite surrounded by this Coat; but being thus involved, is intirely separated from the other, by means of the *Septum*.

It appears by the Date of *Dr. Robinson's* Letter, that it was written to *Mr. Ray* the Year before the second Volume of his *History of Plants* appeared, and therefore it may seem strange, that after all the Pains this Author had been at, he should not have been able to persuade his Correspondent to rank his Coffee *Frutex*, not amongst the *Bacciferous* Plants, as he

has done, but amongst the *Nuciferous*. But the Difference probably lay only in the use of a Word, *Mr. Ray's Arbores Nucifera fructu per Maturitatem Sicco*, differing only from the *Baccifera* of that kind, in size, as he himself informs us.

Both *Lemerys* tell us, that the *Cortex* of the Coffee Fruit is a pretty hard ligneous Husk.

In *Tournefort's* posthumous Treatise we are told that the Seeds are inclosed in Husks, for the most part consisting but of one Cell, sometimes of two. By this, I suppose, the Author means no more than that for the most part, each Husk contains but one Seed, and in what sense that is true, I have already taken Notice.

Volkamerus, who had seen the Coffee Plant in a bearing State, but has only described it as far as he thought it necessary to determine what Family it was of, tells us, that the Fruit consists of two Kernels, lying upon one another, included in a juicy *Pericarpium*; but I do not so well see the force of the Inference he draws from thence, that therefore the Coffee Tree is to be ranked among the *Bacciferous* Kind.

What *De Justis* has told us concerning the Fruit upon the Tree is, that it ends in an *Umbilicus*, being at first of a light green Colour, then reddish, afterwards of a very beautiful Red, and, when perfectly ripe, of a dark Red.

The Pulp is glairous or mucilaginous; of an unpleasant Taste, and when dried, becomes like that of a dried black Prune.

Under this Pulp lie two thin oval Coats, closely adhering together, convex on one side and flat on the other, by which they touch, and of a yellowish white Colour.

Monsieur La Roque much to the same purpose, describes the colour of the Fruit to be green at first, but that it grows red as it ripens.

The Sun having at length dried this red Fruit, the Pulp becomes a Husk of a dark brown Colour, which makes the first or outer *Cortex* of the Coffee Bean, and within it lies another thin Membrane, which makes the second or inner *Cortex*.

Mr. Bradley agrees with these two Authors, pretty much about the Colour of the

the Fruit upon the Trees, and that is all he has thought fit to tell us that belongs to this Head.

Mr. *Miller* informs us, that each Berry incloses two Seeds in an inner thin Skin. The Berry therefore, according to this Author, is the outer Coat of the Fruit.

The Kernels of the COFFEE FRUIT.

ALL these Coverings being removed, the Kernel its self comes next to be examined; the Colour of which, to begin by that, varies according to the goodness and place of growth of the Berry: Thus, some of them have a cast of Green, some are whitish, some dark or brown, and if they are damag'd by salt Water, they are perfectly black; but of this more at length, when I come to enquire into the difference and choice of Coffee; or how to distinguish the Good from the Bad.

As for the figure of the Kernels, that varies likewise; but it is principally determined by the number of them in the same Fruit. The single ones filling the whole Cavity, have liberty to extend themselves equally on all Sides, and consequently the Figure of them is that of a longish Oval, with a Cleft on one Side, upon which lies the abottive Kernel, in form of a *Clypeus* or Target, as has been already said, very thin, and of a circular Figure, a little depressed on one side to accommodate its self to the other.

The double Kernels, for the same reason, are nearly oblong Hemispheroids, being convex on the Back-side, and flat on that by which they joyn one another, and in most of them it may be remarked, that they are a small matter bigger at one end than the other.

Through the middle of the flat Side of each of them, runs a *Sulcus* or *Rima* lengthwise, but generally narrower than that of the single Berries.

The Figure of the triple Kernels is likewise to be determined by their situation in the Seed Vessel, but of these, I believe, there are very few to be found. The far greatest part of the Coffee that is imported into *Europe*, consists of such Kernels as have been double in the same Fruit; and the Size and Weight of those that are brought from *Java* in the *East Indies*, and from *Arabia Felix* by the way of *Turkey*, will be sufficient to determine those of all the other Sorts.

Java Coffee.

Lenth, half an Inch.
 Breadth, five sixteenths of an Inch.
 Weight, three Grains and an half.

Turkey Coffee.

Three eighths of an Inch.
 One eighth of an Inch.
 Three Grains.

The principal Body of each Kernel, consists of a hard, callous or cartilage-like, uniform Substance, made up of two *Laminae*, first laid one upon the other, and then rowled and folded up into the Figure we have just now described.

Whoever views a transverse section of a Kernel, the first Idea of its Structure that will present its self, is undoubtedly that of a Body rowled up, as I have said; but I think a more easy way to conceive that fully, will be first to imagine two oblong hollow Hemispheroids cased closely over one another, and covered with a Lid slit-
 ted through the Middle lenthwise; and then, that this Cavity is filled up by another Body adhering to, or proceeding from the whole under part of one side of the Lid, but loose from the other, under which the Ege of it is turned up, so as to form a new kind of *Sulcus* continuous with the former, tho' not always in the same right Line.

This inner Body I know no better way to express, than by calling it a Procces, arising from one side of the Slit or *Sulcus* so often mentioned.

The structure of a single Kernel is to be conceived much after the same manner, only here the Slit is generally wider, the two sides of it being not flat but convex, and so appear rather as a continuation of the same Figure with that of the back-side of the Kernel, than as a Lid laid over a Cavity. By this means likewise the figure of the Cavity varies, and that of the Procces along with it. In every thing else the structure of both kinds of Kernels is the same.

About both the one and the other, there are these two Things further to be observed: First, that the two *Laminae*, of which they are composed, are not every where of equal Thickness, from whence it follows, that one side of the Cavity is sometimes more shallow than the other.

In the next Place; the Procces does not always come out from the same side of the *Sulcus*, or which is the same Thing, the Kernel is not always rowled up one way; by which I mean, that the situation of all the parts of the Kernel, being determined by that of the seminal Plant, of which, in the next Article; the Procces adheres sometimes to the right side of the *Sulcus*, and sometimes to the left.

Rauwolfus

Rauwolfius has taken notice only of the Colour of the Kernels, and that he says, is yellowish.

From *Alpinus* we learn that the Kernels he found in *Egypt*, were of a sweet Taste mixed with a little Bitterness, but no Sharpness. Whether he was altogether in the right in this, I leave to every Bodies Experience to resolve them.

Clusius tells us, that these Seeds are of a dark yellow Colour, acid Taste, and flat on one side.

J. B. That the Coverings being removed, there appears a hard Kernel much of the shape of a Date Stone, with a hollow running through it lengthwise, of a pale ash Colour and a bitter unpleasant Taste. And that all the way from the *Umbilicus* to the opposite Point, it appears as if it were divided into two Grains (*ab Umbilico ad oppositum Mucronem gemina ostendat grana.*)

From the whole of what has been quoted from this Author, it appears plainly, that this Description was taken from a Fruit with only one Kernel; and therefore its not so easy to guess the meaning of the last Words of it. Considering the Place where they lie, I should be inclined to think they were added by his Editors, for they are no ways of a Piece with the rest; or if they do really belong to *Bauhinus's* own Text, I can make no more of them than this, That when a single Kernel is viewed on that side in which the *Sulcus* lies, it appears as if it were divided into two Grains.

Whatever be in that, there is nothing in all this Description that contradicts what we have heard from *Clusius*, and therefore I cannot imagine the reason why *J. B.* should add, that tho' the outward appearance of his Fruit answer'd in every thing to the Figure given us by *Clusius*, yet there were other things in which they did not agree; and therefore he durst not venture to say that his was the same with that from whence *Clusius's* Figures were taken. It may be his Scruple was grounded upon this, that *Clusius's* Berries were double, and his own single.

By *Olearius*, the Colour of the Coffee Kernels is compared to that of common Wheat, and the Taste to that of Turkey Wheat.

We have heard already, that according to *Veslingius*, the Taste of them is very sensibly bitter.

Parkinson informs us, that on each side of the Husk of the Coffee Fruit, lieth a small long white Kernel, flat on that side they join together, of an acid Taste and somewhat bitter with all.

Banefius distinguishes the Coffee Kernels into two Sorts, with respect to their Colour; the one he says is whitish, the other of a darkish Citron Colour, tending towards a Green; and these last are to be preferred to the other. All this is true enough in fact; but it seems to be owing to our Authors not having understood *Avicenna*, that ever he was so lucky as to observe it. *Avicenna* has told us the same thing of a Root which he calls *Bunchum*; and *Rauwolfius*, *Banefius*, and others, being deceived by the similitude both of the Names and Virtues, have taken this for the *Buna* or Coffee Fruit, but *Salmasius* and *Velschius* have abundantly proved they were in the wrong.

The curious Enquiries that the learned *Dr. Grew* has made concerning Seeds, as well as all the other parts of Plants, have furnished him with some very uncommon Observations concerning the Coffee Fruit in particular, besides what he has said about other Seeds which will equally agree to it. These last I leave to be consulted in his excellent Anatomy of Plants, the others must not be omitted here. Having described the Coverings that belong to Seeds which he proves in the far greatest part of them to be three in Number, he observes that in many, there is a *Vitellum* or Body analogous thereunto, which is neither part of the true Seed nor part of the Covers, but distinct from them both. This, he tells us, makes sometimes the principal part of the Fruit, being much bigger than the true Seed its self; and in enumerating the different Figures, Dispositions and other Properties of these *Vitella*, amongst the rest he observes, that in the Goose-grass or Cliver it is of a horny Substance, but shaped somewhat like a Bonnet with the Rims tucked in; and so in the Coffee Berry, but rowled or folded up into a kind of oval Figure, with a Notch or Ri-
R *ms*

ma running through the Lenth, where the two ends meet.

This Passage contains the only Hint that is to be met with in Authors, concerning the true structure of the Coffee Kernel, and I hope that by the account I have given of it in my Description, it will still be more easily understood.

Dr. *Robinson* has observed but little new upon this Head. Under the second Skin, says he, lie generally two Kernels, sometimes one, round on one side, and flat on the other. On the flat side of the Kernel there is always a Slit or Mouth, so that every Kernel does exactly resemble a *Corncha Veneris*.

Lemery compares the two Kernels together to a young Pea in bigness; and tells us further, that they are of an oval Figure, easily parting into two Halves, of a yellowish Colour with a cast of White.

Langius. That the *Cortex* being removed, the Kernel is of a mealy Taste.

Tournefort. That the Seeds are hard, of a whitish ash Colour, convex on one side, flat on the other, and furrowed; of a mealy Taste and without any smell; five or six Lines in lenth and three in thicknes.

Chomel and *Andry* agree in every thing with *Tournefort*, only the last adds, that these Seeds are very heavy in proportion to their Bulk.

Monsieur De Jussieu's Observations about the Kernels are these. In each of the inner Coats, says he, is contain'd a callous, oval Seed, arched on the back

side and flat on the other; in the middle of which is a pretty deep *Sulcus*, running through its whole Length.

Sometimes one of these Seeds proves abortive, and then the other grows commonly bigger than it would otherwise have been; both sides of it become more convex, and it fills the whole cavity of the Fruit.

Monsieur la Roque has added some new Observations concerning the Kernels of the fresh Fruit, to those of *Monsieur de Jussieu*. Under the Pulp, says he, lies the Bean or Grain which we call Coffee, and when the Fruit hath arrived at its full bigness, the Bean is extremely tender, and of a disagreeable Taste, but as the Fruit ripens, it acquires by degrees, a little more Solidity, and by the time that the Pulp is nearly dried up, the Bean is become pretty hard, and of a light green Colour, swimming in a thick brown and bitter liquor.

Valentini takes notice that what is called Coffee, is nothing but the Kernels of certain small Nuts, consisting of two Parts like Beans, arched on the upper side, flat and furrowed on the under, of a dark yellow Colour, mealy Taste, and Smell like that of burnt Beans. He should have told us that it was the smell of roasted Coffee he meant, and then the Comparison might pass.

Bradley tells us, that instead of a single Stone, the Coffee Fruit has two Kernels, which split in the Middle like the Bay Berries of the Shops. It is true, the Coffee Kernels do split in the Middle, and so do the Bay Berries of the Shops, but wherein the likeness of their splitting consists, I should be glad to learn.

Of the Seminal Plant, or True Seed of the COFFEE FRUIT.

WE have heard from Dr. *Grew*, that the main body of the Kernel, described in the last Article, is not the true Seed, but only a *Vitellum*, or Body analagous thereunto, which he sometimes likewise calls the bulky or Cartilaginous Cover of the Seed.

As he is the only Author who has observed this Difference, so no body but himself has described what the true Seed, as distinguished from the *Vitellum*, really is. The *Fetus*, or true Seed in the Coffee Berry, says he, lies in the inner or Cartilaginous Cover, where one would not expect to find it, near the Top or Surface of the Back. The Lobes of the Seed are veined like two very minute Leaves, and joyned to a long Root like a Stalk, the end of which comes just to the bottom of the Cover, ready for its exit into the Ground.

All this he has expressed by five Figures in *Tab. 77.* of his *Anatomy of Plants*; whereof the first exhibites the belly or furrowed side of the Coffee Berry; the second, the Back; the third, the Back pared a little, so as that the true Seed may appear in *situ*; The fourth represents the true Seed taken out of the Kernel, and the fifth shows it very much magnified.

This is the Account Dr. *Grew* has given us of the true Seed, or as it is called by *Malpighi* and others since his time, the *Seminal Plant* of the Coffee Fruit; and whoever is acquainted with Dr. *Grew's* Writings, knows that according to him, in every seminal Plant there is to be distinguished the *Radicle*, *Lobes*, and *Plume*. This Remark was necessary, in order to the understanding of some Terms which I shall be obliged to make use of in explaining what further Observations I have made upon this Head, both with respect to the Situation and Structure of the Seminal Plant.

It lies between the two *Lamelle* of the *Vitellum* or Body just now described, in a Bed exactly fitted to it; the *Radicle* always terminating at the extremity of the *Sulcus*, which in an intire Kernel, may be discovered by a round Speck, of a different Colour from the rest of the Surface.

As the back of the Kernel is convex, the Seminal Plant, to accommodate its self to that Figure, is likewise bent upwards, and so lies crooked.

The Position of it is not exactly according to the length of the Kernel, or parallel to the longest Diameter of it, but oblique; it being all on one side of the *Rima*, as may be seen by Candle-light, even with the naked Eye, in an intire macerated Kernel.

It is not however always on the same side, but sometimes on the right, sometimes on the left; and yet this Position is no ways casual, but regulated by the Rowl or Fold of the Berry; that is, the Seminal Plant lies always on that side of the *Sulcus* to which the Process is fixed.

The Seminal Plant being taken out of the Kernel, we may observe the Figure of it to be exactly that of the Ace of Spades, only that the *Radicle* is longer in proportion to the *Lobes*.

When it is fresh taken out, the Colour of it is lighter than that of the rest of the Kernel.

The *Radicle* or little Root, as far as I can perceive, is exactly round, and runs tapering from one end to the other, that to which the *Lobes* adhere being smallest, as is expressed in one of Dr. *Grew's* Figures.

The *Lobes* or Leaves may easily be seperated from one another, all the way to their insertion into the *Radicle*, but nothing like a Plume is discernible betwixt them.

Thus far concerning the Seminal Plant of the Coffee Fruit. I have only further to remark, that the contrivance of the situation of it, and indeed of the structure of the whole Kernel, is very particular. The extremity of the *Radicle* is placed in the weakest part of the whole Kernel, and consequently finds the easiest Passage possible into the Ground: The two *Lamelle* are here, as it were, only tucked in, and so, small *Rimæ* or Chinks must necessarily be left, which in dried Kernels are oftentimes increased to very sensible Clifts. Besides, upon the least swelling of the Kernel in the Ground, these Folds must extend themselves, and by this means likewise, favour the exit of the *Radicle*.

Again, by the *Radicle* and tender *Lobes* being placed obliquely, and always on that side to which the Process is fixed, they lie in the most secure part of the whole Kernel, which would have been otherwise, had they lain streight, and so over the *Sulcus*.

The Kernel its self is rolled up in the manner we see it, not only for the security of the Seminal Plant, but also that it may unfold by more easy Degrees, according as the *Lobes* and *Plume* are ready to expand themselves. The first of these Ends accounts likewise
for

for the necessity of the Process, the second for that of the *Rima* or *Sulcus*, and both the one and the other, for the Kernels being made up of two *Lamellæ*. But as this unfolding will require Time; the *Radicle* probably gets a very sure footing in the Ground, before the seminal Leaves reach the Surface of it:

Culture of the COFFEE TREE in Arabia Felix.

THE Coffee Shrubs, Sir *Hans Sloane* observes, are planted in *Arabia Felix* every where, in a rich Ground or Mold in great Plenty, and they are watered in Times of Drought, as other cultivated Vegetables there are, by artificial Channels from Rivers, cut on purpose to nourish them. After three or four Years bearing, the Inhabitants are forced to plant new Shrubs, because the old ones become not so fruitful after that Time.

It is likewise worth taking notice, that in those Parts they dry the Fruit in the Sun, and afterwards take off the Husks, by means of Hand-mills, as they do here Husks of several sorts of Grain, to fit them for use.

The greatest Part of these Observations are agreeable to what we are told by *Monsieur La Roque*. Our Travellers, says that Author, are very positive, that the Coffee Tree is raised no other way but by the Seed, the intire Fruit with all the Coverings upon it being set in the Ground. From these, Nurseries of young Plants are raised, which they afterwards transplant as there is occasion.

The Plantations are chiefly made near the feet of Mountains; and upon gentle rising Grounds; and they always choose such Places as are most shady, and best supply'd with Water.

The greatest part of the Culture consists in bringing Water from Sources, and little Rivulets found in the Mountains, by Streams or Channels carried on purpose, quit round the Trees; for they must be well watered and kept moist, in order both to fructify, as they ought, and to bring their Fruit to due Maturity. And therefore, whenever the *Arabians* have a mind to transplant young Trees, they begin by making a Ditch three Foot wide and five deep, which they border or line with Pebles and Flint Stones, that the Water with which the Ditch is filled, may the more easily penetrate a great way into the Earth, and so preserve a due Moisture there. But when they see a great deal of ripe Fruit upon the Trees, they set off the Water from about them, that the Fruit may not be hindered from drying upon the Branches, as much as is necessary it should.

If the *French* Officers had not travell'd to *Movab* the Capital of *Yemen*, we should still have been ignorant of one Particularity which relates to the Coffee Trees, and has hitherto been taken notice of by no Author, *viz.* That in Places that lie towards the South, or are very much exposed, the Coffee Trees are planted under other great Trees, which they take to be a kind of Poplars, and these serve to skreen them from the excessive heat of the Sun. The Inhabitants are perswaded, that without this Shade, the Flowers of the Coffee Tree would be soon quite burnt up, and so never produce any Fruit, and our Travellers were convinced of the truth of this, by what they observed in some Trees, growing in such Places without the advantage of a Shade. These Poplars extend their Branches very much on all sides, and form a sort of *Umbrella*, which covers intirely whatever is found under it.

It was at some distance from the City of *Tagus* where they saw the first Coffee Trees, that they likewise observed this Singularity; the Country being there open, and much exposed to the burning heat of the Sun. Each Poplar had a certain number of Coffee Trees under it, through the whole Plantation; they being planted in rows, as they do the Apple Trees in *Normandy*.

In other Places which are not so much exposed to the Sun, these shady Trees are not to be found, there being no occasion for them: But there, as well as every where else, the Coffee Trees stand in Lines, at a small distance from one another.

I cannot help observing here, by the by, that it was undoubtedly the Coffee Trees being planted under others, that led *Monsieur Bernier* into the mistake of thinking this Plant a Species of the *Convolvulus*. *Dr. Robinson* has long ago made this Remark, but it could not be known at that Time, what had given occasion to *Monsieur Bernier's* Mistake.

But to go on with *Monsieur la Roque*. As for the Coffee Harvest, says he, since the same Tree is at the same Time often loaded with Flowers, and green and ripe Fruit; that must necessarily happen at three different Seasons; but as these are not all regular and fixed, the *Arabians* reckon but one Harvest in the Year, which is always in *May*, the far greatest quantity of Coffee being gathered at that Time.

For this purpose they spread a Canvas under the Tree, and then shake it; and this brings away with ease all the Coffee that is throughly ripe.

As soon as it is gathered, they put it into Sacks, and carry it to a convenient Place for drying. There they lay it in Heaps upon Matts, exposed to the Sun, till such time they think the Husks may be easily got off, by means of large Stone or Iron Rollets; which they draw over them for that Effect.

When the Beans are thus cleared from the Husks, and parted in two in the manner we see them, they are laid out to dry in the Sun a second time, being as yet too green and moist to suffer the Sea; afterwards they winnow them with great Fans, till they are thoroughly clean; for without that Care, their Coffee does not sell at near so great a Price as otherwise.

Thus far *Monsieur la Roque*; and by all these different parts of Labour is Coffee made fit for Use or Sale; being transported in this State, in immense Quantities, from one Province of *Arabia Felix* alone, through all the rest of *Asia*, and *Europe*, and a good Part of *Africa* and *America*.

Whether the Arabians use any Art to prevent the growth of the COFFEE PLANT in other Countries.

WHO was the Inventor or first relater of this Story, That the *Arabians* spoil the generative Faculty of the Coffee Fruit, I cannot find. Of all the Authors I have consulted, *Du Four* is the first who has mentioned it; but at the same time he talks of it as a thing that had been often said before him; neither is he at all inclined to think it is true.

A great many People assure us, says he, that the Coffee Fruit is boiled, or passed through a hot Oven before it be exposed to sale, in order to destroy the *Germe* or vegetative Principle in it, for fear it should be sown elsewhere. Others maintain the contrary, and their Opinion is grounded on a Reason, which to me seems undisputable. If it were true, say they, that Coffee is either boiled or heated in an Oven before it is exported from *Arabia*, it would be a very rare thing to find any Berries with the Skins upon them, for these being but thin, would necessarily be consumed at the first approach of fire, and yet a great many such Berries are to be met with in the Coffee that comes to these Parts; besides, the Fire would give it a burnt Taste or Smell, which nevertheless we do not perceive it hath.

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Those who are for the other side of the Question, answer, that the Tree which bears the Coffee, being a Plant of so great Consequence, it is impossible to think that either Curiosity, Necessity or Interest, must not have naturalized it in some other Country before this Time, if the germinative faculty of the Fruit were not lost before it reaches any other Place. But such People do not duly attend to the dispensations of Providence, which has given to every Country, exclusive of all others, the privilege of producing some Things, which all the Industry of Man can never render common in any but that.

Dr. *Robinson*, tho' without giving any reason for it, is of a different Opinion from *Monsieur Du Four*. The *Arabians*, according to him, are as careful in destroying the germinative Faculty of the Coffee Fruit or Seed, as the *Dutch* of the *Moluccos* are in their Nutmegs.

This Opinion is likewise adopted by Mr. *Ray*, and he has translated Dr. *Robinson's* Words into *Latin*, without ever inquiring further about the truth of them. It was probably new to him, and therefore made a very proper Material for his Botanical common Place Book, I mean his *History of Plants*; where the Question, generally speaking, is what Authors have said, but seldom whether they were in the right for saying so.

Monsieur Du Mont has talked more reasonably upon this Subject. It is a Mistake, says he, to believe that the *Arabians*, either by Fire or Water, endeavour to prevent the propagation of Coffee elsewhere. Nature has saved them this Trouble, in giving the Country of *Yemen* alone, the Qualities necessary for producing this Plant in any Plenty, and refusing it to all others. Of this the *Turks* have had the Experience in an hundred Places of *Anatolia* and *Romania*, so that after all their Trials, they are still obliged to go and buy their Coffee at *Suez*.

Blegny advances two other Reasons against this Opinion, both drawn from Matters of Fact. The first is, That a Gentleman, near *Dijon* in *Burgundy*, sowed some Coffee Seeds as they came from the *Levant*, which produced Plants every way like those that grow in *Arabia*. This has been since contradicted, but his second Reason, I my self have experienced the Truth of, namely, that if a Berry is kept but a Day or two in cold Water, it will begin to Chit.

Houghton made the same Experiment, but not with the same Success. I put some Berries into a glass of Water, says he, about a
Week

Week since, to see if they will sprout, but as yet there is no appearance, altho' they are tollerably swell'd and look white and bright. But he adds, that by making a Decoction of them, he has made them shoot.

Another convincing Proof of the falsity of this Reproach made to the *Arabians*, is given us by *Monsieur de Jussieu*, in these Words: When the Seeds are set in the Ground as soon as they are pulled from the Trees, they will hardly fail to succeed, but after any considerable time, they seldom come to any Thing; and this justifies the Inhabitants of the Coffee Country, from the Accusation they have been loaded with, of boiling or drying by Fire, all the Coffee they suffer to be exported, lest it should be sown in any other Country.

All these Arguments notwithstanding, Mr. *Bradley* has thought fit to publish this Story lately from Mr. *Ray*, that is at least from the third Hand; and in so doing he is more inexcusable than any of the other two. So Prudent are the Masters of that Country, says he, speaking of *Arabia Felix*, that on no account will they suffer either Plant or Seed to come alive out of their Dominions; taking great care to destroy the Germinative Faculty of those Berries they send Abroad, and inflicting the most severe Punishments on such as attempt the Transportation of any Plants of it.

That the *Arabians* prohibit the Transportation of Coffee Plants under the severest Penalties, is very reasonable to suppose, but I am surprized to hear Mr. *Bradley* talk of the Germinative Faculty being destroyed in all the Seeds they Transport, and that he says no more about it. For in the first Place, in another of his Books, he has given us two very good Reasons why any such Practice as this (were it possible without damaging the Seeds) is altogether needless. The Coffee Berries, according to him, must be planted with one of the Husks on, therefore since both the Husks are taken off with all possible Care, as being what inhances the value of the Coffee; they have no occasion to use any other Art, to prevent its being propagated from Seeds they send Abroad.

Again Mr. *Bradley* tells us, the Seeds must be planted as soon as they are gathered, and he has even insisted, at great length, on the absolute necessity thereof; there is therefore certainly no danger of any Plantation being begun in other Countries by Seeds: And accordingly we find that the *Dutch* never thought of cultivating Coffee in the Island of *Java*, 'till they had first, by a lucky Stratagem, found the means of getting some Plants from *Arabia*.

In the second Place, how could Mr. *Bradley*, a Philosophical Botanist, and who had before the publication of his Treatise on Coffee, written so much concerning the Theory of Vegetation, menti-

on so singular a *Phænomenon* as this, without at least endeavouring to account for it? Especially after what he might have found upon this Subject, in Dr. *Grew's Anatomy of Plants*, in which it is shown, as we have already heard, that let the Germinative Faculty of the Coffee Berries be destroyed never so much, the *Germe* it self is not; the Seminal Plant being still as plainly discernible in the Coffee as it is brought to us, as in any other Seed whatever.

These two Reflections relate chiefly to Mr. *Bradley*, tho' the first of them may be applied to the fact in Question, about which some further Observations from *Monsieur la Roque* deserve still to be added.

It is the general Opinion, says that Author, but of which the Learned begin to see the Folly more and more every Day, that the *Arabians*, jealous of this Commodity only to be found amongst them, never suffer so much as one Coffee Bean to go out of their Country, which has not passed the Fire, or been boiled in Water, to kill the *Germe*, as is pretended, that so, if any body had a mind to sow it in another Country, it might be to no purpose. *John Ray*, an *English* Doctor, and one of the most celebrated Botanists of our Time, has given in to this vulgar Error, as well as the rest; for after talking of the Virtues of Coffee, he tells us very seriously, that it is surprising how the *Arabians* should prevent the exportation of so much as one Grain of Coffee into another Country, that is capable of producing a Plant, &c. But this is a Mistake, for which there can be no further Pretence, after the Assurances our Travellers have given us of the contrary; and after the intire Bales of Coffee in Husk, which the *French* Vessels brought along with them; for these certainly had undergone no change.



Explana-

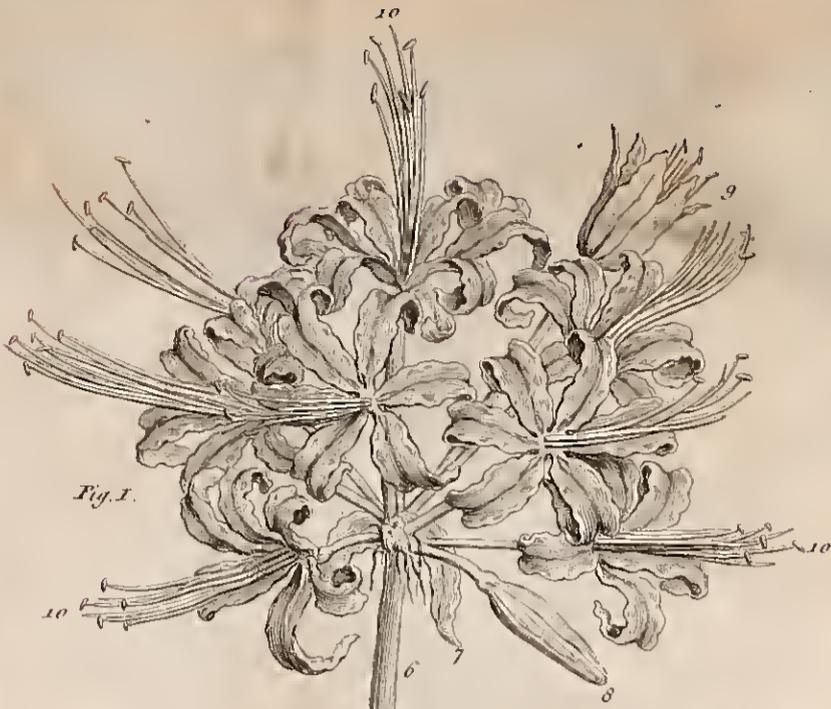


Fig. 1.

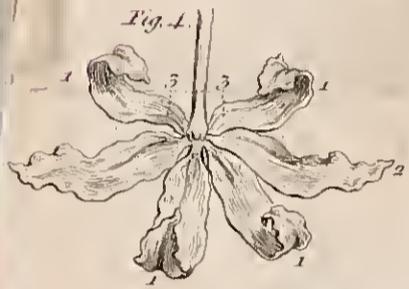


Fig. 4.

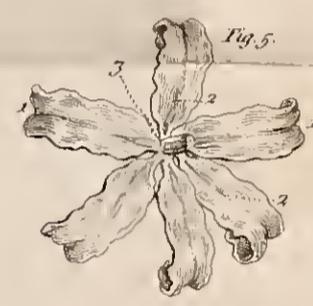


Fig. 5.

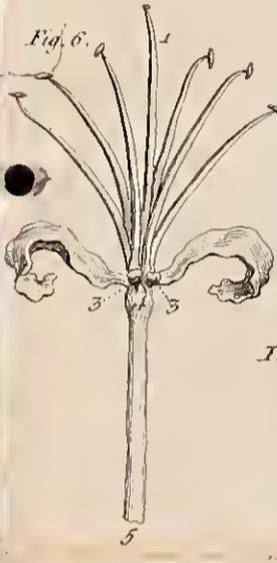


Fig. 6.



Fig. 2.

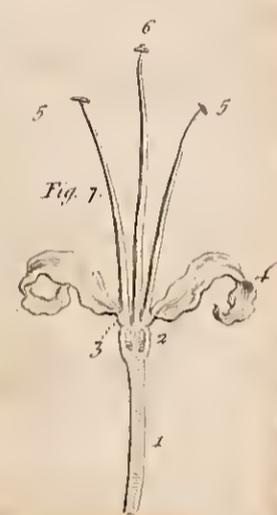


Fig. 7.

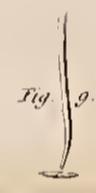


Fig. 9.

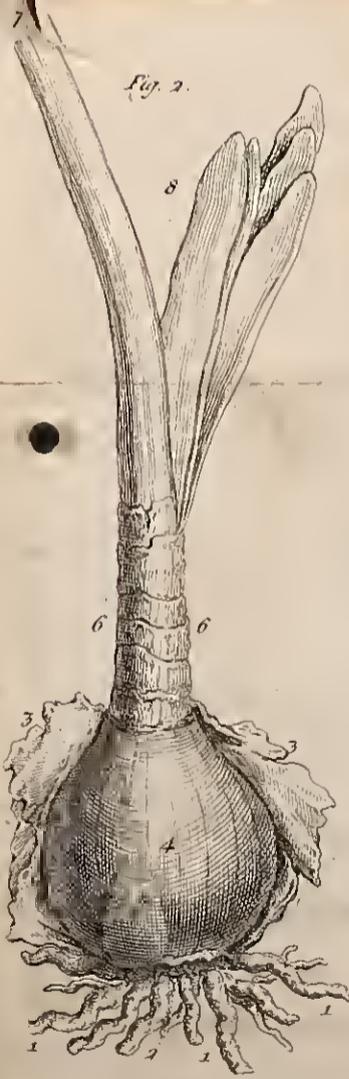


Fig. 2.



Fig. 3.

Fig. 8.

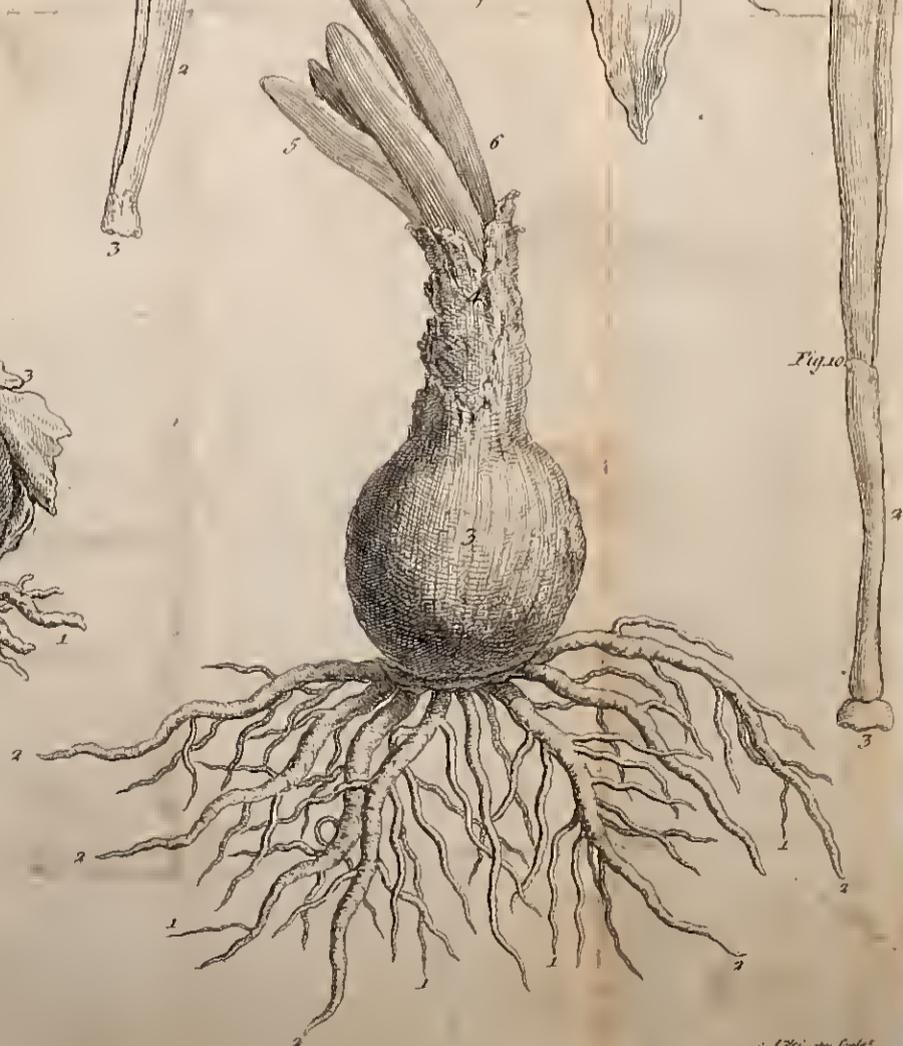


Fig. 10.

