

The jewel house of art and nature: containing divers rare and profitable inventions together with sundry new experiments in the art of husbandry. With divers chymical conclusions concerning the art of distillation. And the rare practises and uses thereof / Faithfully and familiarly set down ... By Sir Hugh Plat ... Whereunto is added, a rare and excellent discourse of minerals, stones, gums, and rosins; with the vertues and use thereof, by D.B. Gent.

Contributors

Plat, Hugh, Sir, 1552-1608?
Boate, Arnold, 1600?-1653?
Gent, D. B.

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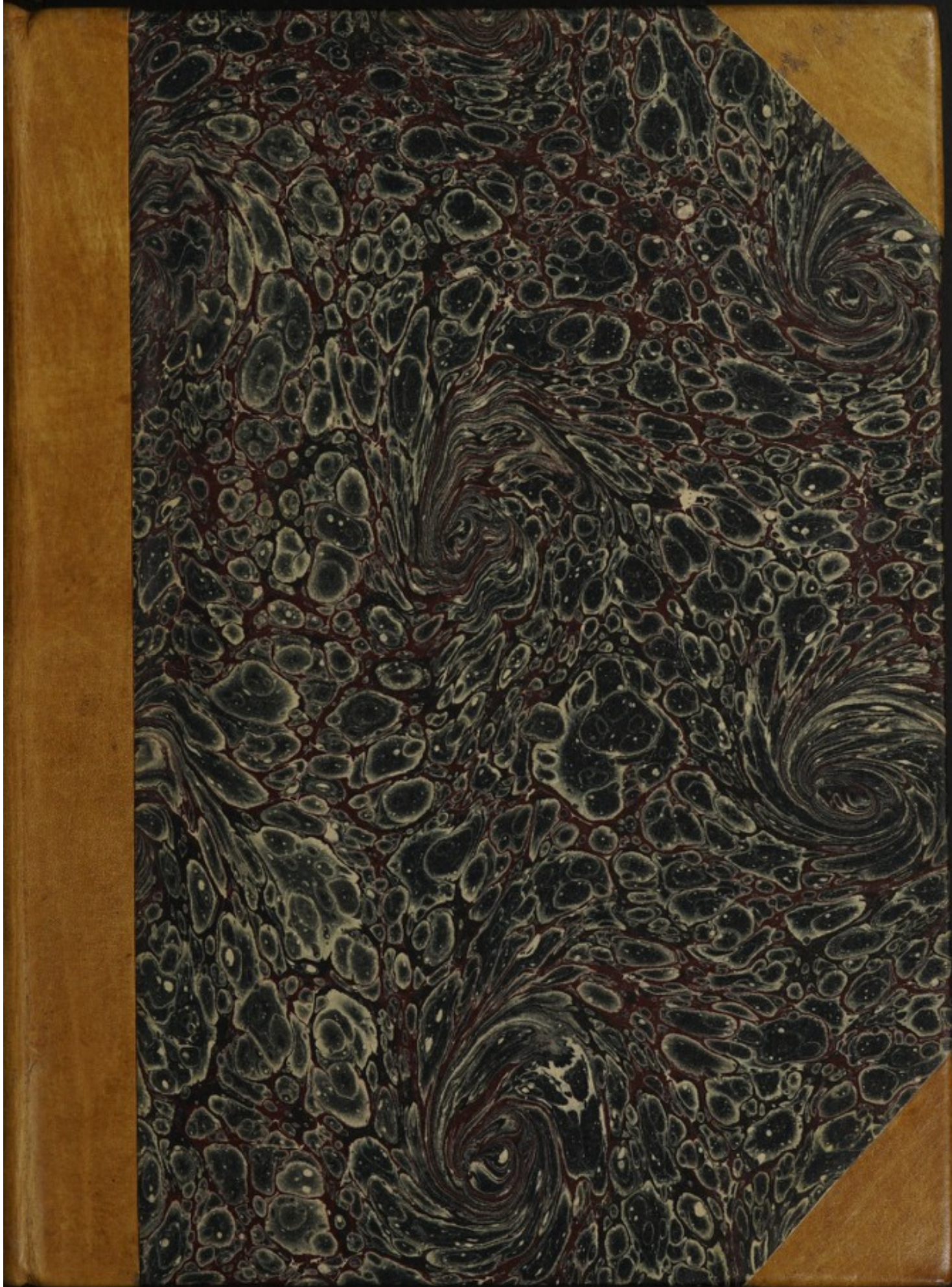
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Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>



PLAT'S
JEWEL
HOUSE

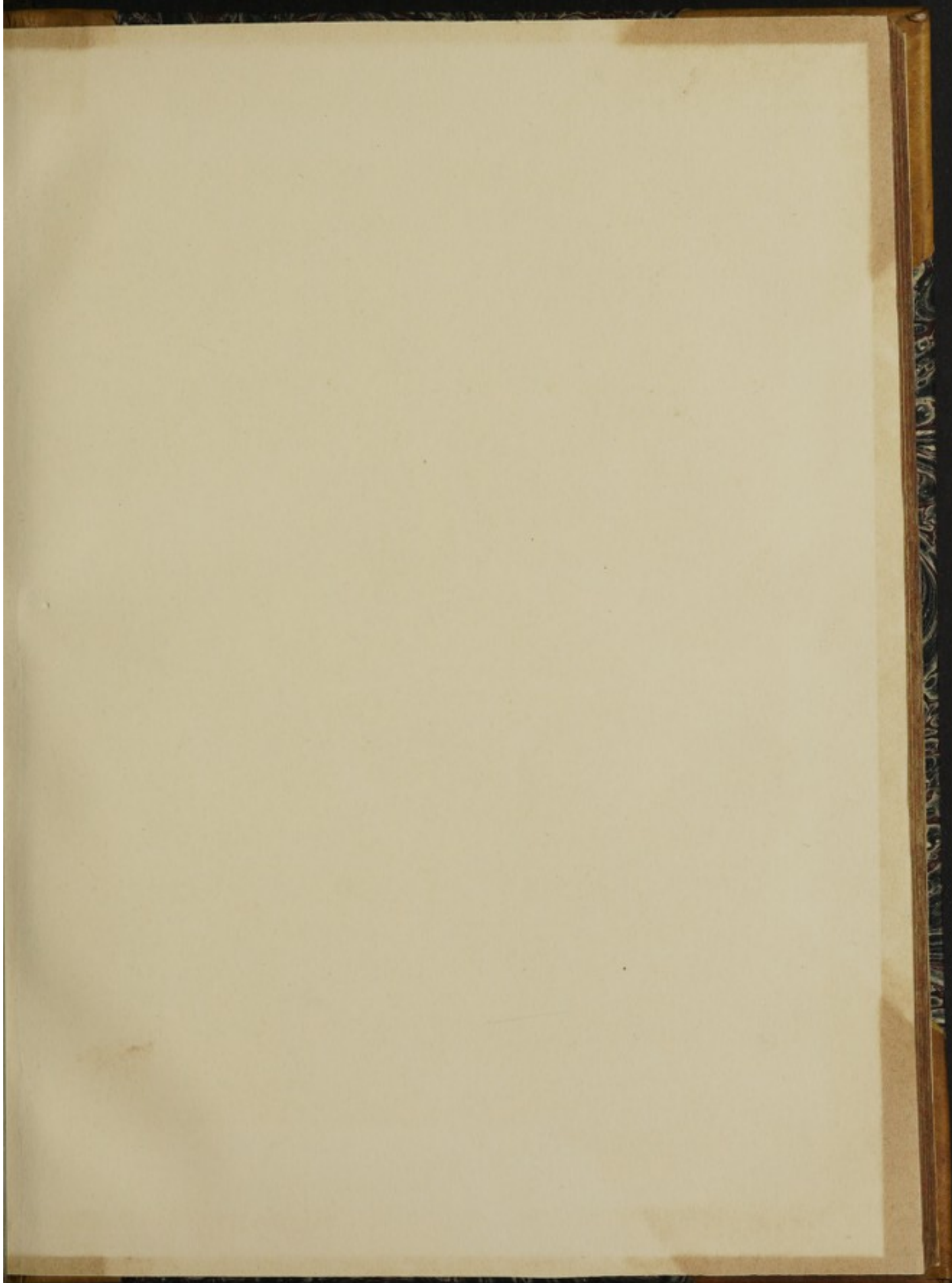
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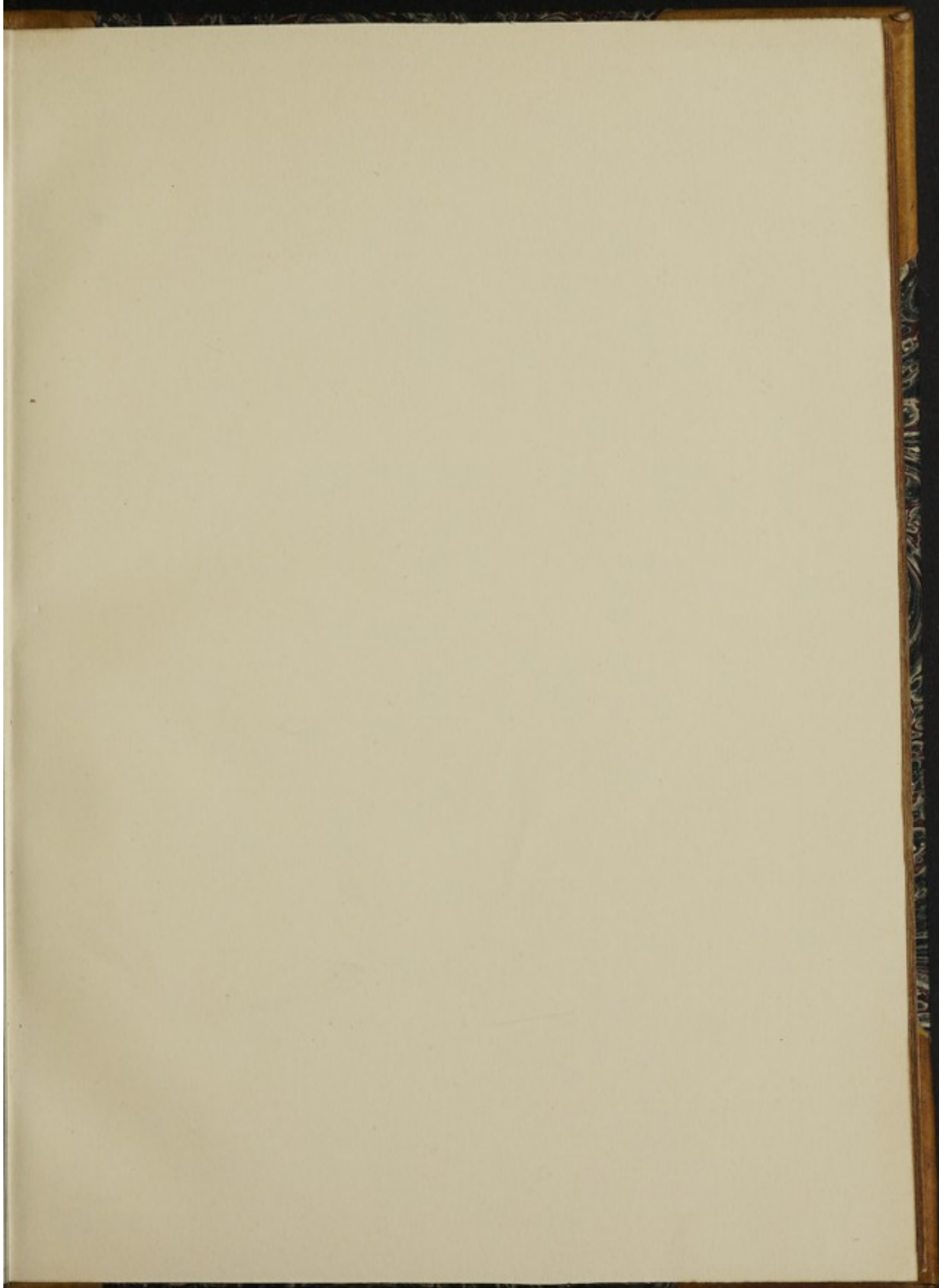






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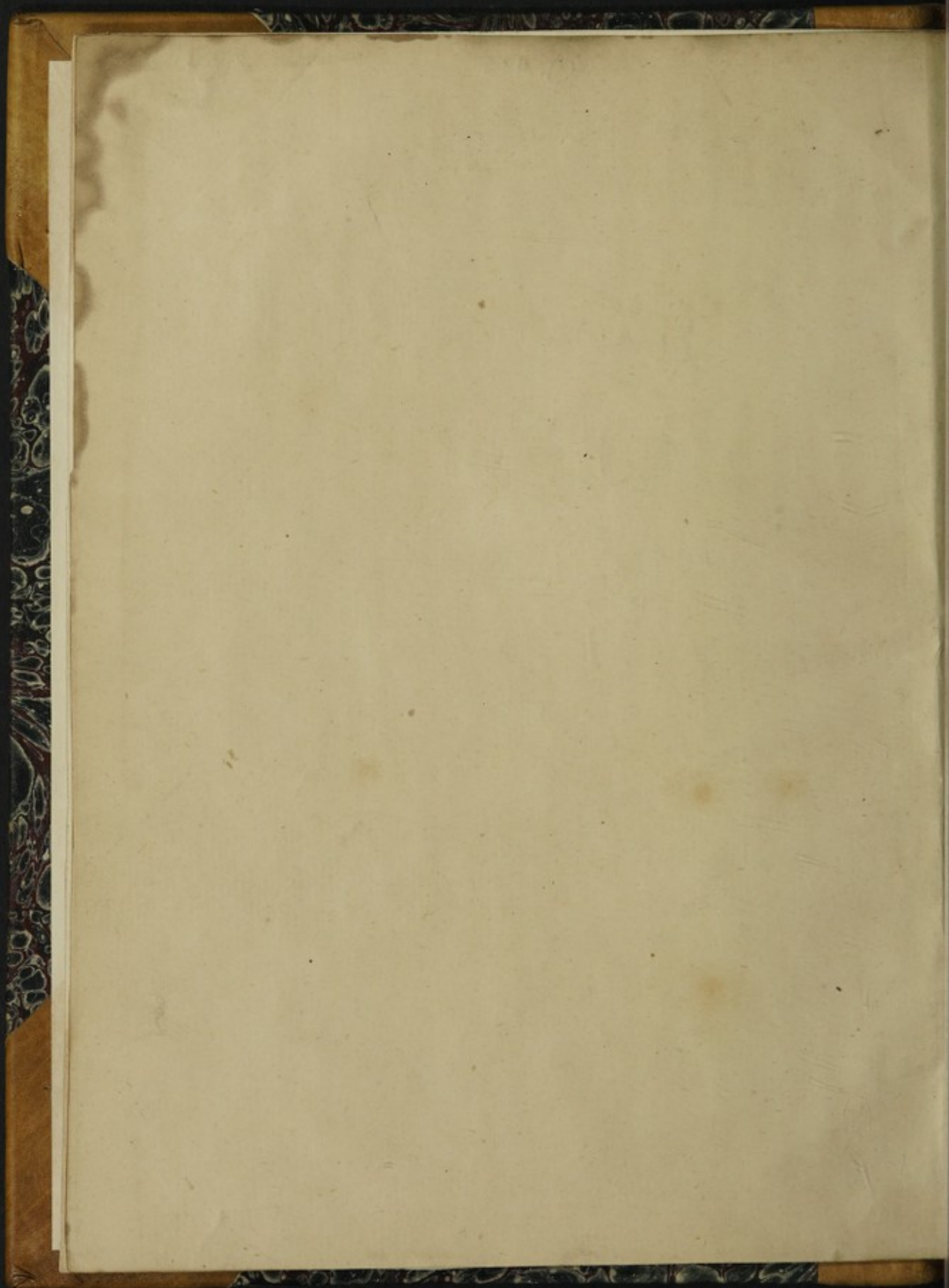




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Letters

Plat 6

Jewel

House

1653

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THE
JEWEL HOUSE
OF
Art and Nature :

CONTAINING
Divers Rare and Profitable Inven-
tions, together with sundry new Experiments in
in the Art of Husbandry.

WITH
Divers Chymical Conclusions concerning the Art
of Distillation, and the rare practises and uses thereof.

Faith'ully and familiarly set down, according
to the Authours own Experience.

By Sir Hugh Plat of *Lincolns-Inne*, Knight.

Whereunto is added, A rare and excellent Discourse
of Minerals, Stones, Gums, and Rosins ; with the vertues
and use thereof, By D. B. Gent.

LONDON : Printed By *Elizabeth Alsop*. and are to be
sold at her house in Grubstreet, near the Upper Pump. 1653.

The true Portraiture of an Ear of Summer Barley, as it grew at
 Bishops-Hall in Middlesex, Anno Dom. 1594. the ground
 being manured with Sope-ashes, according to the man-
 ner hereafter expressed, Pag. 139.



5 10 15 20 25 30 35 40 45
 Inches in Length.

To the Munificent Lover of all Learning, the Right Honorable, Boulstroad Whitlock, one of the Lord Commissioners of the Great Seal of England, &c.

My Lord,

Here is not any thing in Nature so churlish to it self, which endeavoreth not to its own protection, it being the businesse and delight of Nature to protect her self. But to protect the Arts is a work (my Lord) which requires a Head of Honour, the depth of whose knowledge can understand their Mysteries, and the height of whose Dignities can countenance their Merits.

In this Treatise your Honour shall find lively represented, how wonderfully Nature doth actuate, whether you look upon it as Nature Naturing, which is God; or, Nature Natured, which reflects onely on compounded Bodies; and, as the Philosophers do define, is the beginning of their Motion, and their Rest.

A 2

Your

*Richard Francellin Esquire
Sonne to Richard Francellin Esquire
daughter to Richard Francellin*

The Epistle Dedicatory.

Your Honor may here behold the latter in all her Beauty ; and observe how Industrious is Art to work her up to her Quintessence of Perfection ; from whence many inestimable Treasures may be derived, to advance as well the Mind as the Body of the Creature, and to improve the glory of the Creator.

My Lord, you have read that Art doth perfect Nature, which can never more properly be understood then in this sense; for although Nature appears a most fair and fruitful Body, and as admirable in her variety as abundance; yet the Art here mentioned is as a Soul to inform that Body, to examine and to refine her actions, and to teach her to understand those abilities of her own, which before lay undiscovered to her.

My Lord, this is a Subject which is worthy of the greatest and the gravest apprehensions, and deserves the noblest Patronage; by which your Honour shall oblige both Art and Nature ; and more particularly him, who is,

My Lord,

Your most humbly

devoted Servant,

The Table.

The Table.

- 1 Sundry new and artificial ways for the keeping of fruits and flowers in thoir fresh hue, after they are gathered from their stalks and branches.
2. A perspective ring that will discover all the cards that are near him that weareth it on his finger.
3. How to carry gold in a most secret manner.
4. How to keep or preserve any fowl, or other peece of flesh, sound and sweet, the space of three weeks, or one whole moneth together, notwithstanding the contagiousness of the weather.
5. How to defend fresh water a long time from putrifaction.
6. A Merchants Compass, whereby he may know upon what point the wind blows, in his bed-chamber, and in the night time, without beholding the skie, or any vane abroad.
7. How to feed and fatten hens, chickens, geese, ducks, &c. in a more cheap manner, then hath as yet been made known or common to the world.
8. How to write a letter secretly, that cannot easily be discerned, or suspected.
9. How to brew good and wholesome beer without any hops at all.
10. How to harden leather, so as the same shall last much longer in the suckers of pumps, then it doth unprepared.
11. A conceited chafing-dish, to keep a dish of meat long hot upon the table, without any coals therein.
12. How to roast meat more speedily, and with less fire then we do in our common manner.
13. To make a new piece of Walnut tree or Wainscot to be of one colour with the old.
14. How to turn five spits with one hand, whereby also much fire is saved.
15. A probable conjecture at the composition of hard Wax.
16. To help Venison that is tainted.
17. A Pistol of two feet in length, to deliver a bullet point blank at eight score.
18. A Piece whereby to perform some extraordinary service.
19. To make green wood burn clear at the further end of the Oven.
20. How to walk safely upon a high scaffold with danger of falling.
21. A round ball of copper to blow the fire with.
22. How to erect over any brook, a cheap wooden bridge of 40 or 50 foot in length, without fastening any timber-work within the water.
23. A cheap Lanthorn to carry a light in any stormy weather, without any defensive before it.
24. To plum up a horse, to keep him from tiring in his travel, and to make him some at the bit.

The Table.

25. A drink for travellers to be made Ex tempore, when they want good beer or ale at their Inns.
26. How to endure ones hand in molten lead.
27. To hold an hot iron bar in a naked hand.
28. Sweet cakes made without either spice or sugar.
29. One candle to make as great a light as two or three.
30. Timber made to last long in water works.
31. To close the chops of green timber.
32. To grave any device on an Egg shell, and to through cut the same.
33. An appearance of strange forms in a glass.
34. Ink to be carried in the form of a powder.
35. To write both blew and red letters at once.
36. Ink kept from freezing and moulding.
37. How to draw any pattern by a desk of glass.
38. Helps for the speedy attaining of the Secretary hand.
39. To help Ink when it waxeth thick.
40. To renew old letters that are almost worn out.
41. To speak by signs onely.
42. Limning with colours drawn from flowers.
43. A ready way to learn the A, B, C.
44. To grave and inlay colours into all the mettals.
45. To make bad paper to bear ink.
46. To make an egg to stand alone without any help.
47. To harden the white of an egg into a gum.
48. A cheap candle or lamp for poor folks.
49. To refresh the colours of old oil pictures.
50. An excellent cement for broken glasses.
51. To dry gun-powder without danger of fire.
52. To draw fish to a certain place in the night by a candle.
53. A bait to catch fish with.
54. To draw fish into a trammel.
55. Divers good baits to catch fish with.
56. A ready way to catch Pigeons.
57. A worm to catch birds with.
58. To catch Crows, Jackdaws, &c.
59. To kill Scapies, Seaguls, &c.
60. To gather Wasps.
61. To keep garments and hangings from moth eating.
62. To help beer that sowreth or is dead.
63. To help a Chimney that is on fire presently.
64. To have Sea fish all the year long.
65. To make beer stale quickly.
66. To steal Bees.
67. To make a tallow candle last long.
68. How to tel the just number of apples, nuts, shillings, &c. as they lie in bulk together.
69. To prevent drunkenness.
70. An excellent tent for a Diamond.

The Table.

71. Oyl or vernish made to dry speedily.
72. To fetch out any stain.
73. To help wine that reboileth.
74. How to make a Bragger.
75. Clarifying of honey in an excellent manner.
76. To make an artificial Malmſie.
77. To keep Gascoign wine good a long time.
78. To keep walnuts good and moiſt a long time.
79. To preſerve the glos of Spaniſh leather.
80. To help ſmoking chimneys.
81. Tinder and matches ſweetend of a new kind.
82. An excellent mixture to ſcour pewter withall.
83. To defend a horſe from flies in his travel.
84. To kill Rats in a Garner.
85. To take away the offence of noiſom vaults.
86. Sweet and delicate dentrifices; or rubbers for the teeth.
87. To help horſe and man that is tender footed.
88. To keep Oyſters good ten or twelve days.
89. To keep Lobſters, Cray. fiſhes, Prawns, &c. good and ſweet ſome reasonable time.
90. To make ſmooth or glistering ſtores or walls.
91. To make Parchment transparent.
92. A cheap mortar to be uſed in buildings.
93. A conceited drinking glaſs.
94. To diſſolve gold, and to part it from gilt ſilver.
95. To know when the moon is at the full by a glaſs of water.
96. To melt down iron eaſily.
97. To put ſeveral wines in one glaſs.
98. The Art of Memory.
99. To make a conceited projection either upon Sol or Luna.
100. To nip a glaſſe. Hermetice.
101. A Waggon to be drawn with men.
102. A delicate ſtove to ſweat in.
103. The art of refining of Sugar.
104. A Philoſophical diſcourſe touching ſundry new ſorts of ſoyle or Marl, for the better manuring of paſture or arable grounds; with divers conceits of Husbandry; not heretofore publiſhed.
105. The manner of drawing or extracting of the Oyls out of herbs or ſpices, with all neceſſary circumſtances.
106. How to rectifie the ſaid Oyls.
107. Divers ſpecial uſes of the ſaid Oyls, not heretofore publiſhed.
108. Divers ſweet or hand-waters made *ex tempore* with the ſaid oyls.
109. How to make ſundry ſorts of dainty butter with the ſaid Oyl.
110. To make any Cheeſe to taſte of your aforeſaid Oyls.
111. Whoſome and comfortable *Manus Chriſti* for weak ſtomacks.
112. Divers excellent kinds of Bottle-ale made with the ſaid Oyls.
113. Wormwood wine made very ſpeedily, and in great quantity.

The Table.

114. How to sweeten the oyl of Almonds with the aforesaid Oyls, so as the same may serve the Perfumer instead of the Oyl of Benz.
115. How to draw Oyl of wax, amber, jet, Turpentine, &c.
116. Of expressed Oyls.
117. How to make Cinamon water.
118. How to make the extraction of all herbes.
119. How to make salt of herbes.
120. How to draw and rectifie a spirit of Wine in divers manners, as well with fire as without fire.
121. To make Claret mount up in a red cloud into a glasse of water.
122. To extract the spirit of any vegetable or herb.
123. To give a pretty grace in taste and property to the spirit of wine.
124. How to draw the spirit of honey.
125. How to distil Rose-water, both good cheap, and at Michaelmasse; and so have as good yeeld as at any other time of the year.
126. How to dry Rose leaves, or any other single flowers in such shape as they grow, without any wrinkles, so as a bushel of moist leaves shall become a bushel in measure when they be dry; and how to keep rose cakes and rose leaves all the year without worms.
127. Rose-water and Rose-vinegar of the colour of the Rose, and so of the Cowslip and Violet-vinegar.
128. How to distil Wine vinegar or good Aliger; that it may be both clear and sharp for sauce, and other uses.
129. How to keep the juyce of Orenge and Limmons all the year.
130. How to purifie, and give an excellent smell and taste to salter oyl.
131. How to dissolve both Coral and Pearl.
132. How to clarify with out any distillation, as well the White, as the Claret wine vinegar, wherewith to make gallies, or other sauces.
133. To make any decoction, whether of diet drink or other, in the summer time, to last longer then otherwise it would without help.
134. How to draw the true spirit of Roses, and all other herbes, &c.
135. How to draw the true and simple Oyl of Roses.
136. Ypocras made speedily.
137. A touch at *Borax Christallinus*.
138. How to make Camphire remain liquid in the form of an Oyl.
139. An artificial extraction of that sweet sirrup of Raisins, &c.
140. How to preserve Damsons, Cherries, Pear-plums, Gooseberries, &c. in their own juyce or sirrup, without the addition of Rosewater.
141. The Art of Molding and Casting.
142. A new kind of fire of less charge then ordinary with Sea coals.
143. A vessel of wood to brew or boil in.
144. A Boulting Huteh.
145. A portable Pump.
146. A wholesome, lasting, and fresh victual for the Navy.
147. A speedy way for the inning of any breach.
148. A light garment, and yet sufficient against all rainy weather.
149. An additional discourse of several sorts of Stones, Minerals, &c.
- 150.

Divers



Divers new and conceited

EXPERIMENTS

FROM

The which there may be sundry both pleasing and profitable uses drawn, by them that have either wit, or will, to apply them.

I, *Sundry new and artificial ways for the keeping of fruits and flowers, in their fresh hue, after they are gathered from the stalks or branches.*



Use new Forms of Lead to be made; either round or square, that may fit the bignesse of your flower, or fruit which you mean to keep, in every of which forms place one flower, Cherry, Plum, or Pear, hanging by the stalk in such manner as it grew; let these forms be well fitted with their apt covers, and sodered very close with soft soder, which will run with a small heat, so as no air enter; bury them deep in a shady place, where the Sun may work no penetration. Some commend a sandy, and some a gravelly ground, above all other for this purpose, but if they be well sodered, I think any ground will serve the turn, or if you think good, you may hang them by lines in some cool and running brooke. Or else you may

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put

put every severall fruit or flower in his severall earthen pot well leaded within, and covered with earthen covers, well burnt and leaded likewise, cementing or closing them together with the Goldsmiths wax or cement, consisting of stone-pitch, rosen, powder of brick, and such like (although some content themselves with molten brimstone, and others with yellow waxe and rosen, molten and well wrought together.) These little pots you must place within greater, and these greater within vessels of wood, stopping up every breathing place that you can imagine (for here I can assure you that the ayr will be a player, unlesse you can keep it out of the Alley perforce.) If you would afterwards bury these vessels, then were it requisite to pitch them well, both within and without; but if you mean to place them onely in cool or fresh vaults or sellers, then may you very well spare this defensative, so as the cask be strong and tite of it self. Yet some commend the keeping of fruit or flowers in glasses made of purpose for them, to be the best of all others, so as the glasses be made with long necks, and be nipped (*hermetice*) with a pair of hot tongs, the manner whereof you shall find hereafter set down *num. 100.* I dare not commend it in any high terms, the dipping of fruit in wax well tempered with some Turpentine, Pitch, Rosen, sweet suet, or Barrows greace: where also some would have the fruit first wrapped in paper to keep it the cleaner, although I know there is somewhat to be performed this way in some kinds of fruits which begin to rot from the outward parts inwardly. But if the fruit begin to rot first at the core, as the Katherin pear, & divers other sorts of fruit do, then all the outward covers

covers and enclosures whatsoever (yea, though they were dipped in dissolved Amber, which is counted the purest and most defenlative garment of all the rest) will never be able to turn nature out of her bias. [Here also sharp spirited wits have imagined, that if spirit of wine well rectified, were glutted with the imbibition of any flower, until it could work no more upon the same, that thereby it were possible to preserve any flower of the same kind a long time therein. But this is to be understood onely of the dry leaves, which bring nothing else but the tincture and strength of the herb with them, and not of the moist leaves, which will leave a putrifying flame behind them, which in time will help to corrupt the spirit. Now methinks I see a whole troop of gallant Dames attending with their listning ears, or rather longing with their great bellies, to learn some new found skill, how they may play at chop cherry when cherry time is past. Well, to give these Ladies some content, I will unfold a scroul which I had long since as carefully wrapped up as ever any of the Sybils did their fatal Prophecies, wherein I will make them as cunning as my self (saving onely that I will reserve one strange Venue to foil a Scholler withal if need be.) The secret is short, Let one Element be included in another, so as the one may have no access, nor participate with the other. But this peradventure is too Philosophical for Women; then receive it Ladies with plain tearms into your open lips. For want of glassees with broad skirts (whereof notwithstanding I do think that there are enough to be had, if you can be so gracious with the master of the Glass house) cause new Pewter vessels of some large reception to be made, and of

the fashion of bell Saltfellers, with divers eyes or hooks hanging in the inside, at the which you must fasten the cherries by their stalks, and hang them so as that one may not touch another, the skirts of which vessels you must compals with leaden rings of such weight as may be able to press them down to the bottome of some leaded pan, wherein you must place them, having first filled the pan almost full with fair water, prepared as is here set down, *num. 5.* lest by putrifaction of the water, the cherries also begin to putrifie with it. Yet here you must be carefull, that the cherries hang within the air of these inner vessels, not touching the water, which may happily rise one inch or somewhat more within the innermost skirts of them. And thus the air being kept cool, and defended from change (whose alteration from heat to cold, and from moisture to driness, is the principal means of the ruining of all mortal bodies) will preserve such cherries as it receiveth in charge for two whole moneths at the least, as I have long since proved. And peradventure if you make choise of sound fruit gathered after two or three fair days together, the dew being sufficiently drawn from them by the Sun, you may yet keep them somewhat longer.

But the onely pleasure of this secret is performed in glasses, through whose perspicuity after some reasonable quantity of water first removed or divided, one may discern weekly in what plight they are. It seemeth very probable, that if cherries as they hang upon their branches, and before they come to their full maturity, were included in an earthen vessel of some receipt, having a party cover with a hole in the midst, divided into two equal parts, and every breathing place well stopt or luted, and the Sun sufficiently

ficiently defended from the pot, that so the fruit would keep fresh a long time upon the tree whereon it grows.

This secret extendeth generally to all fruit. And it is not much unlike to the spreading of a Tent over a Cherry tree about fourteen days or three weeks before the Cherries were ripe, practised by a Surry Knight not many years sithence, whereby he did greatly backward the tree in his bearing, now and then watering the Tent in a sunny day with cold water, whereby the strength of the Sun beams became very weak upon the tree; and when he was disposed to ripen them speedily, he withdrew the Vail, giving a freer passage to the hot and scorching beams of Phoebus. By the help of some one of these, or of some other of the like kind and quality, it was my hap to present unto a late Lord Mayor of the City of London 8 green and fresh Artichokes upon Twelf day, with a score of fresh Orenge, which I had kept from Whitsuntide then last past; at which time I was also furnished with two hundred Artichokes for my own provision; which continued a service at my table all the Lent ensuing, to the great contentment of sundry of my guests, who would have been right glad to have dined with the secret onely.

2. *A perspective Ring, that will discover all the Cards that are near him that weareth it on his finger.*

A Christal stone or glasse of the bigness of a two-penny peece of silver, or thereabout, being the just half of a round ball or Globe, and cut hollow within, having a good fyle sweetly conveyed within

the concave superficies thereof, and the stone it self neatly polished within and without, will give a lively representation to the eye of him that weareth it, of all such cards as his companions that are next him do hold in their hands, especially if the owner thereof do take the upper end of the table for his place, and leaning now and then on his elbow, or stretching out his arm, do apply his Ring aptly for the purpose. I have discovered this secret, rather to discourage young Novesses from card-play, who by one experiment may onely guess, how many slights and couzenages are daily practised in our dicing and gaming houses, not doubting but that the general publication thereof will make the same so familiar with all men, as that I shall not justly be charged of any, to have taught old knaves new school-points.

This secret is as yet meerly French, but it had been long since either denized, or made English, if there could have been found any sufficient workman amongst us, that could have filed the stone so artificially as it ought to be. There be some English Knights that can sufficiently testifie the truth hereof, by that which they have seen amongst the French Gamesters.

3. How to carry Gold in a most secret manner.

MELT down some Gold, and mix therewith a sufficient quantity of Lead (but then you shall be forced to test the same before you can recover your Gold again,) and this is the most secret way of all the rest, because there will be no shew or appearance of Gold either within or without; but the separation will be somewhat troublesome. But if you
would

would carry Gold about you in such manner, as that without any other mans help, you may divide the Gold your self from the mettall wherein you convey it, then cast bullets of Gold in a pistol mold, which you may so aptly hang within some mold of greater bore, that may fit the piece which you carry with you (which will be also a good means to remove all suspicion of art) as that by pouring of Lead round about them, they may serve instead of coars to your greater bullets, which with a small heat are soon parted in sunder. But if you would carry coin, then dip your Angels or Crowns in molten Lead that is not over hot, and convey them by art within some small and feat Leaden weights, that may agree with the *Aver du poiz*. Some commend the powder of Marble, mingled with molten Rosin, to lap Angels or other coin in, before it be through cold. There be also divers Philosophical ways for the secretting of *Sol* and *Luna*, but those are reserved for higher purposes.

4. *How to keep or preserve any Fowl or other peece of Flesh, sound and sweet for three weeks, or one whole moneth together, notwithstanding the contagiousness of the weather.*

Make a strong Brine, so as the water be overglutted with salt, and being scalding hot parboil therein the Fowl or Flesh which you would preserve some reasonable time, that is to say, according to the greatnesse or grossnesse thereof, then hang it up in a convenient place, and it will last a sufficient time without any bad or oversaltish tast, as I can testifie of my own experience. This is thought good

to be published both for the better preservation of Mutton, Veal, and Venison, whereof a great deal in this land is yearly lost, in hot and unseasonable summers, as also for the benefit of our English Mariners, which are forced sometimes to victual themselves in such untemperate climates, where no flesh will last sweet four and twenty hours together, by reason that they have no means to make the same to take salt, which without all question will enter this way, and penetrate very speedily by reason of the hot and fiery spirit of salt thus prepared. Some do use to parboil their Fowl, after they have taken out the garbage, and then do dip them in Barrows-greace, or in clarified butter, till they have gotten a new garment over them, and then they lay them one by one in stone pots, filling the stone pots up to the brim with Barrows greace or clarified Butter, wherein they do prick some Cloves, and sprinkle dried salt upon the uppermost face thereof, placing the pots in some convenient cool place, stopping them very close, and they will keep sweet and good a moneth together.

5. How to defend fresh water a long time from putrefaction.

TO so many casks as you fill with water, take the number of empty casks, and when your water begins to change, draw it forth into your fresh casks (being sweet and good) and to a Hogf-head put one pound of the best Brimstone beaten to powder, and incorporate it well with your water, and your water will keep good and sweet many months together: some have used to adde a good quantity

tity of salt, but I have known by good experience, that it may be as well preserved without it. *Socius* and others that made triall of many experiments in this kind, do chiefly commend the first way simply by it self, for that salt giveth a brackish tast, and may not agree so well with many mens bodies. If your vessels be kept very close, and are pierced about the middle, it will adde much to the benefit which you desire to find hereby. These few conceits I have thought good to impart for the benefit of the whole Navy of England, for the which here is provided more dainty cares, then they have been hitherto acquainted withall.

6. *A Merchants Compass, whereby he may know upon what point the wind blows in his bed Chamber, and in the night time, without beholding the skie or any Vane abroad.*

FAsten a large vane to a long iron rod, let the same rise through the midst of the roof, or some other part, that may best agree with the room wherein you mean to place the same, and let the iron steal thereof, come through the sealing of your chamber, and at the end of the rod, let there be a sharp *index*, that may point upon a table of wood (which for that purpose must be drawn, with al the parts of the wind upon it like a *Marriners Compass*) to that wind which bloweth. You must have divers staves of iron by the way as the rod passeth to keep it upright, having holes in the midst of them, and wrought with lappers at the sides, wherein to fasten nails to a long post, which for the same purpose must be placed within the garret, between the sealing of your chamber and

and the roof thereof. Note that the *index* and the edge of the vene must alway stand upon two direct contrary points.

7. *How to feed and fatten Hens, Chickens, Geese, Ducks &c. with divers other sorts of Fowl, in a more cheap manner, then hath as yet been made known or common to the world.*

I Know that divers have contented themselves, to feed and fatten them with grains onely, whereof they have made a great benefit unto themselves; by reason of the easie price for which they are sold. But if you take the bloud of beasts whereof the Butchers make no great reckoning, fill stone pots therewith, whose covers may be full of such holes as that the flesh flies in summer-time, may easily get in and out at the same, you shall find the bloud by means of the flie-blows and putrifaction together, wholly converted into white and glib worms (which the anglers call *Gentils*) which will fatten them exceedingly, and make them eat most tenderly. A Dutch man that first practised this secret in a Noble mans house of England, (whose fowl for the tenderesse of their flesh, was highly commended of all his guests, had a yearly stipend of twenty nobles conferred upon him by his Lord, during his natural life, for the discovery of the secret. Yet I could wish that these worms did first scour themselves either in mosse, loam, or bran, before they were scattered amongst the fowl: And if notwithstanding this help the food shall seem offensive to our weak stomacks, especially being made acquainted with it before hand, then receive the same in a better form, and in a sweeter manner at my hands

hands, who have always desired to give all the grace which I might to any secret of good use. Boil this bloud with some store of bran amongst it (perhaps grains may suffice, but bran is the better) until it come to the nature and shape of a bloud pudding, and therewith feed your fowl as fat as you please; and this will be both a cleanly and a wholesome feeding for them. Some comend Carrots, Turnips, Parsnips, and Pompeons, first sodden, and then some bran or course Pollard mingled therewith. You may feed Turkeys with bruised acorns, and they will prosper exceedingly with them. Some to fatten their Capons speedily, put them into coops, wherein each bird hath a severall room divided from the rest, being so straight and narrow as that the hen or capon may onely feed himself and roost therein, not being able to turn his body, thereby perswading themselves that wanting motion and exercise he will soon grow to be fat, and of greafe. Some do use to keep them without meat til they be exceeding hungry, and then they give them their fill. Others do soak chippings and other crusts of bread, in broken beer or flatten milk, wherewith they do afterward feed their capons. Out of all these a good housewife will chuse both the likeliest and the best.

8. *How to write a Letter secretly, that cannot easily be discovered or suspected.*

WRite your mind at large on the one side of the paper with common ink, and on the other side with milk, that which you would have secret, and when you would make the same legible, hold that side which is written with ink to the fire,

and the milky letters will shew blewish on the other side. Or els rule two papers of one bigness with lines of an equal distance, make the one full of glass windows, through which you must write your mind upon a second paper, then fill up the spaces with some other idle words: but if all were made to hang together in good sense, it would carry the les suspicion. Each friend must have one of the cut papers to read all such letters as shal be sent to him, and this way of writing wil trouble a good decipherer to bring into perfect sense. Also you may first write a letter that may carry some good sense to your friend, but let the lines be wide asunder. Then between these lines write your secret letters with gal water only, wherein the gals have been infused but a small time (for if after you have written with it, there be any sensible color left behind on the paper, you must throw away that water, and make new.) This being dry, and of one colour with the paper, will give no cause of suspicio, and the rather because the letter purporteth a sufficient sense already. Now for the discovery of it, you must dissolve some coppers in fair water, & with a fine calaber pencil, first dipt in the coppers water, you must artly moist the interlining of your Letter, and thereby you shall make it sufficiently legible. This is one of the most secret ways that I know. But yet the finest conceited way of all in my opinion, is the close carriage of a letter in a Lawn or Cambrick ruff or handkerchief, which a man may wear for his necessary use, without the defacing of any one letter contained therein. And this serveth most fitly for a Love letter, w^{ch} may without all suspicion of friends be easily presented in a handkerchief, to any gentlewoman that standeth well affected to her Secretary.

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There is also a ready way without changing the Alphabet, to write ones mind speedily upon paper, and yet the same not to be deciphered without the help of a rolling pin of the same scantling with that whereon it was first written. But these two latter conceits (for some reasons best known to my self) I may not so boldly impart as otherwise I would.

9. *How to Brew good and wholesome Beer, without any Hops at all.*

Since my profession in this Book is in some sort to Sanatomize both Art and Nature, without any regard of private mens profits, whom it may either essentially or accidentally touch: I am bold therefore, without craving any leave to do good, to renew, or rather to confirm & ratifie an ancient opinion & practise, which long since in the great dearth and scarcity of hops, many Brewers of this land have been forced to put in use for the better supportation of their weak and declining estates. But because they failed in proportion (without the which there can be nothing compleat or absolute) they suffered a good conceit to die in the birth. And no marvel then if wormwood, notwithstanding it be a simple so highly commended of al the ancient and new Herbarists for his great and singular effects in Physick, be in a manner utterly abandoned of all the Brewers of our time (except a few that can make a difference between 5 s. and 5 l. charge, when hops are sold for 50 s. the hundred) seeing as yet not any one of them hath so Clarkly wrought upon this simple, as to cover and hide the taste thereof from the well mouthed Ale-conners of this Common-wealth. Which weakness of theirs, because it consisteth wholly in the

want of a due proportion between the Malt and other beer corn in respect of Wormwood, I have thought good to set down a sufficient direction for such as are wise and willing to do good both to themselves and to their Country, whereby they may easily, even in one days days practise attain to the full perfection thereof.

Supposing then that your Wormwood is either cut down in the leaf before it be seeded, or being seeded that it is cut in short pieces, whereby there may be made an equal mixture of the whole bulk together (for you must note, that the seeded tops are much stronger, and more oylly then the rest of the leaves or stalks) make first a decoction of four ounces of hops with nine gallons of water (which is the proportion that some Brewers in some sorts of drink do use) and when you have gotten out by ebullition the full strength and vertue of them, keep the same apart, and begin likewise with some small proportion of Wormwood to the like quantity of water as before ; and when you have bestowed as much time and fire herein, as you did about the hops, then taste each of them by it self, and if you find the same to exceed the first in bitternesse, then begin with a lesse proportion of Wormwood, and so reiterate your work, until you have equally matched the one with the other, and then may you safely proceed by the rule of proportion to a barrel, and from thence to a tun, and so to a whole brewing. Neither let the excessive bitternesse of Wormwood in his present tast any thing dismay you ; for if you did but tast the decoction of hops onely, before the mixture of the ground Malt (which doth wonderfully sweeten the same) you would think it a very unapt liquor to be wrought

wrought up into so pleasing a drink as our ordinary beer doth shew it self to be. For it is the hops onely which maketh the essential difference between Beer and Ale, and that by allaying the exceeding lusciousnesse of the Malt, with his bitternesse, whereby both uniting themselves together, become a savory and wholesome drink for mans body. Which may be as well in every respect performed with Wormwood as with the Hop, yea and peradventure with Centuary, Artichoke leaves, or *Aloes Hipatique*, as some work-masters have confidently affirmed unto me. And though the Hop be usual in drink and the wormwood onely in medicine, whereby some may happily be perswaded, that it is inconvenient for men that are in health to drink a medicine continually to their meate, yet let this be a sufficient answer to that objection, that it is the dose onely that maketh the difference herein. For I can assure you in my own experience, and by the experience of one of the best experienced Brewers of London, who yet liveth, that if you give a double or treble quantity of good English Hops, to an ordinary guile of strong beer, you shal find the same to be a sufficient preparative to your body for the best purgation that shall be ministered after. And this can one of the right honourable Peers of this land sufficiently witness, who together with some good part of his retinue, having well tasted at a dinner of such beer, as (by the misprision of the Brewer of English hops for Flemish hops) was so over hopped, that both himself, and the rest of his family that was then about him, were suddenly surprized with a great loosnesse. And this is the reason why venice Turpentine, which being ministered in a smal dose is given for the strengthen-
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ing of the back, and to stay the running of the reins ; yet if it be taken in the quantity of an ounce at once, it wil purge sufficiently in divers bodies: so then either let there be no more taste of wormwood then there is of hops in our drink, and we shal find no difference in effects, but such as shall commend and grace the wormwood beyond the hop ; or else let beer be advanced with the hop, to the bitterneſs of wormwood wine, and so we shall find the hop far to exceed the wormwood in his malign quality. Neither would I have any man to think, that I do either wrongfully intrude upon other mens possessions, or presumptuously undertake a charge which I cannot perform ; for I am in by discent, and have continued 5 years in possession at the least, and therefore am not easily to be removed, without a Philosophical action commenced against me. And because you shall further know that I have some reasonable skill in my trade, I dare undertake without the help of any yeast at al, to bring the wort either of Ale or Beer to his perfect workmanship (wherein it shal continue at the least 6 or 7 days together) without any intermission, and that only by a Philosophical stirring up of the fire of nature which shall extend and spread it self *à centro ad circumferentiam*, till it have digested the whole body to his perfect ripeness or maturity. Thus much I have thought good to publish for the credit of Wormwood, and for the benefit of this Island in sundry respects, which I shall not need to particularize at this time, because they are so commonly know to all men. And though I know I may be overweyed either with the Flanders Merchants, or with the great Hop-masters of England, whose foundation is so deeply laid, that a few loose lines can neither shake
nor

nor stir the same: yet either knowing, or at the least perswading my self to maintain the truth, before I give it over I will crave the liberty of the Schools, *quod fiat controversia*. And in the mean time those which will not be satisfied of the wholsom and rare medicinable helps of the one, together with the weak and feeble vertues of the other (which was but a Hedgebird the other day, though now it be perking so proudly upon its poles) I will refer them to the learned Herbals of Dioscorides, Matheolus, Doctor Turner, Dodoneus, Turnizerus, and the rest.

10. *How to harden leather so as the same shal last much longer in the suckers of pumps, then it doth unprepared.*

THis secret is so necessary for the whole land, as that I must crave pardon of my especial good friend for the discovery thereof. Lay such leather as is well tanned, to soak in water wherein there hath been some store of the filings of iron a long time, or else in the water that hath lain long under a Grind-stone, into the which such iron as hath from time to time been ground away, hath fallen, and there settled. This hath been found to be a secret of good use, by one of the Pump-makers of our time, & if thou canst pump out any better uses of this secret, take them in advantage, and remember where thou hadst them.

11. *A conceited Chasing-dish to keep a dish of meat long hot upon the Table without any coles therein.*

LEt the dish be somewhat deep, and cause the chasing dish to be made of such shape as may best receive the same, into the which you may convey a

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piece

peece of iron red hot, the same being of an apt form to lie in the bottome of the chafing dish. This will continue his heat a long time; & if you have another spare iron to heat as the first cooleth, you may keep any dish of meat warm as long as you think good: from this ground did those warming pins first spring which of some are called Froes, and being put into their cases, and those cases wrapped in linnen bags, do serve to heat beds with, and to cast one into a kindly sweate. The like device is also used by others in conveying of such iron pins into hollow boxes of wood first lined inwardly with metall, and iron chests, either to lay under their feet where they used to write or study in cold weather, or in their coaches to keep their feet warm. The now distressed King of Portugal caused a pair of wooden soles to be made for a pair of shoes which he had to sit in, which he would warm at his pleasure with *Mars* well rubified.

12. *How to roast meat more speedily, and with lesse fire then we now do in our common manner.*

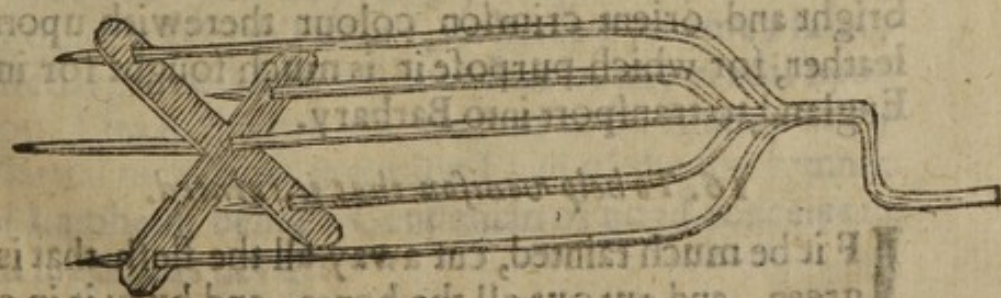
MAKE a square and concave box, or else of the fashion of a Cilinder of iron plates, or else of wood lined with those plates, long enough, and large enough for such and so many joynts of meat as you mean to roast at once; within which Cilinder let the meat turn as it roseth. For the reflexion of the heat that is gathered within the box, will make great expedition. Note that the box must onely cover the meat, because you are to leave a fire (if need be) to hang on a pot or kettle over the same fire. It must also be close on every side, saving onely against the fire, and at the sides thereof you must have flits to let
in

in the spit. I have heard of the like devise heretofore practised by an outlandish potter in burnt clay, for the which he had his priviledge, but his device wanted a cover, it was exceeding heavy very apt to be broken, and not so strong in reflexion as this mettalline devise, especially if it be kept clean and bright.

13. To make a new piece of Walnut-tree or Wainscot to be of one self-same colour with the old.

First strain Walnut rinds well purified with some liquor, and with a sponge rub over your wood thoroughly well, and after it is dry, rub the same over again with good old Linseed oyl, and it will become of an excellent brown colour: then if the other wood which you would have match with it, do much differ from the new in color, you must also with a fine sand scour off all the filth and greace of your old wood, and then rub it also over with Linseed oyl. Some take broken beer onely. By this means I had an old wainscot window, that was pieced out with new wainscot by a good workman, and both became very suitable and of one colour.

14. How to turn five spits at once with one hand, whereby also much fire is saved.



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Fasten

FAften five round spits together, like the teeth or tines of a mole-spear, with a handle in the center of them, let them be placed in a reasonable distance the one from the other, according to the bignesse of the joints of meat that you would roast upon them, (I take them to be most apt for fowl) you must also have a cross of iron, having a hole in every corner thereof, to receive the ends of these spits, which may be propped with a stay behind that it fall not backward: Using these spits, you shall not need to raise your fire upon such high ranges as otherwise you shall be forced to do, when one spit is placed directly above another. This secret I have borrowed out of Pope *Pius* the fifth, his Kitchen.

15. *A probable conjecture, at the composition of hard Wax.*

IAm verily perswaded that the essential part, if not the whole body thereof, is made of the gum *Lacca* peradventure refined a little, or incorporated with some other apt body. For I have sealed therewith oftentimes, and do find the same to agree with hard wax, in the perfect taking of the impression of the seal, in the manner of the burning, in the smell, and in brittleness. It onely differeth in clearnesse and colour. I have heard that the Barbarians do make a bright and orient crimson colour therewith upon leather, for which purpose it is much sought for in England, to transport into Barbary.

16. *To help venison that is tainted.*

IF it be much tainted, cut away all the flesh that is green, and cut out all the bones, and bury it in a
thin

thin old course cloath a yard deep in the ground for 12 or 20 hours space, and it will be sweet enough to be eaten, as I am informed by a Gentlewoman of good credit, and upon her own practise.

17. *How to make a Pistol whose barrel is 2 foot in length to deliver a bullet point blank at eight score.*

A Pistol of the aforelaid length, and being of the petronel bore, or a bore higher, having eight gutters somewhat deep in the inside of the barrel, & the bullet a thought bigger then the bore, and so rammed in at the first three or four inches at the least, and after driven down with the scouring stick, will deliver his bullet at such distance. This I had of an English Gentleman of good note for an approved experiment.

18. *A piece whereby to perform some extraordinary service either by sea or land.*

CAuse a long barrel to be made, and of the bore of a Tennis bal, of five or six foot in length and well stocked, having within twelve inches of the mouth thereof, a hooking iron of four inches in length forged to the neather part of the piece, by which hook you may stay your piece by some rail, or other piece of Timber, whereby you may safely discharge the same, without fear of any recoil upon you. I leave the full use thereof to be found out by Martial men. This invention I had of the fine lymner of Lambeth, being a Gentleman of good concept in all ingenious devises.

19. To make green wood to burn clear at the further end of the Oven.

IF you burn green wood in an Oven, it burneth somewhat clear towards the mouth of the oven, but commonly black and deadish at the further end, whereby the oven is never sufficiently heated to bake well. You shal find a remedy thereof in this manner. Divide the mouth of the oven into four equal parts, and cause a bar of iron to be made as long, or somewhat longer then the mouth of the oven, & in bredth one exact fourth part thereof. Fasten this bar overthwart wise in the middle point of the oven mouth, and this will make a partition between the fire and the air, so as the air will passe under the bar to kindle the fire, and the flame will issue over the bar, and so the smoke which before did choke the fire, will also have his passage.

20. How a man may walk safely upon a high scaffold or piece of Timber, without danger of falling.

THIS is easily performed by wearing of a pair of spectacles, whose sights must be made so gross as that he which weareth them may not discern any thing a far off but at hand onely. For it is the sight onely of the steepnesse of the place, that bringeth the fear and overturneth the brain. By this means I have heard that the English man which displayed an ancient upon a scaffold near the top of the pinnacle of Pauls steeple, did help himself in his desperate attempt.

21. *A round ball of Copper or Latten, that will blow the fire very strongly, onely by the attenuation of water into air; which device may also serve to perfume with.*

MAke a round bal of copper or latten, of the bignesse of a small bowl, solder thereunto a round pipe or neck, of three or four inches in length, and somewhat less then a Goose quill, at the end whereof, in the manner of an elbow, solder on a less pipe no bigger then a straw, whose vent in the end may not much exceed the bigness of a pinhole, let al the joints and sides be soldered with silver solder; heat the same well in the fire, and then put it into a vessel of cold water, and it will suck some of the water into it; you may heat the same so often, till by the peize thereof you may be assured that it is more then half full. Then set this ball upon a few glowing coals, and you shall find the same to give a very strong blast against the fire which you mean to kindle, directing the nose of these bellows towards the same. I make no que-



stion, but that it is possible with a very small help to melt down either gold or silver with these bellows, & that the same may be made so large as that they will blow one whole hour together, without any intermission. If you make a little round ball of silver in

this manner, onely with a small and straight pipe, rising out of the body thereof, you may put some rose-water,

water, or some other sweet senting water therein, and therewith perfume your chamber, and by this means a small quantity of sweet water will be a long time in breathing out.

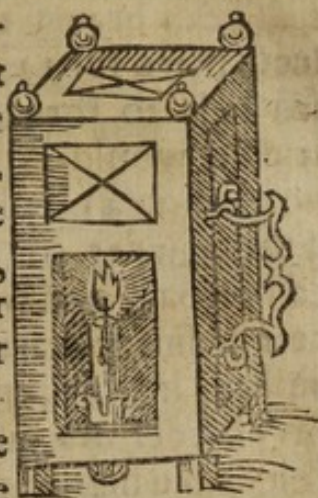
22. *How to erect or build over any Brook, or small River, a cheap and wooden bridg of 40 or 50 foot in length, without fastening any timber work within the water.*

Peece the Timber work in such sort, as that it may resemble an arch of stone; make the joynts strong, and bind them fast with cramps or dogs of Iron: Let this bridge rest upon two strong pillars of wood at either end, both being well propped with spurs, and at either end of your bridge make a strong buttress of brick, into the which you must let your pillars and spurs, that by no means they may shrink or give backward: then plank over your bridge and gravel it, and it will last a long time. This is already in experience amongst us.

23. *A cheap Lanthorn, wherein a burning candle may be carried in any stormy or windy weather, without any horn, glass, paper, or other defensative before it.*

MAke a four square box of 6 or 7 inches every way, and 17 or 18 inches in length, with a lock in the bottome thereof; close the sides wel, either with dove tails or cement, so as they take no air; leave in the middest of one of the sides a slit or open door, to put in the candle, which from the bottome to the top thereof, may contain 6 or 7 inches in length, and two and a half in breadth: place your candle in
the

the socket, and though it stand open and naked to the air without any defence, yet the wind wil have no power to extinguish the same. The reason seems to be, because the box is already full of aire, whereby there is no roome or place to contain any more, neither can the air find any through passage, by reason of the closenesse thereof. The socket would be



made to screw in and out at the bottome, and then you may put in your candle before you fasten the socket. This is borrowed of one of the rarest Mathematicians of our age.

24. *How to plom up a horse, and make him fat and lusty, as also how to keep a jade from tiring by the way, and to make him to foam at the bit.*

TAke *anula campana*, Comminseed, Turmerick, and Anniseeds, of each a penny worth, and seeth them well (with three heads of Garlick amongst them well stamped) in a gallon of ale, then strein it, and expresse as much of the substance as you may well wring out, and give your horse to drink thereof bloud warm a full quart at once, then ride him til he be hot, then stable him, litter him well, and curry him untill he be cold, do the like two or three mornings together, and so turn him to grasse, and he will thrive wonderfully in a short time. Some commend a handfull of grunfell fodden in the aforelaid Ale with the rest of the ingredients. But if you keep him in the stable, give him to eat in his provender the roots of *anula campana*, with some Commin

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seeds

feeds both beaten together, or the *Ænula campala* small shred for 14 days together, and it will make a lean Jade to thrive more in one moneth then otherwise he would do in three. And when you ride abroad upon a hired Hackney, carry a good quantity of the powder of *ænula campana* with you in some leather bag, and when others do bait their horses in their ordinary manner, your horse being first well walked, littered, and rubbed, give him a handfull of this powder in a quart of strong ale with a horn, and tie his head high to the rack, and you need to give him no other or very little provender until night, then let him be well meated, and give him in the morning two peny worth of bread, and his ale with the powder, but water at night. This a friend of mine yet living, did learn of a good fellow that had been a rank rider in his days, by whose means, though his hackny tyred at Bristol, yet this companion for his better encouragement, seeing him out of al heart, by reason that he was like to lose so good company as then was gathered together, he exchanged horses with him, and brought the hackney (by the means aforesaid) very quick and lively up to London, Also if you tie a pretty bunch of Penni-royal about the bit within the horses mouth, the horse champing thereon, will foam gallantly, and travel with much more courage. Another Gentleman, who also attendeth upon a very honourable person, told me, That whensoever he found any Jade to tyre under him, he would presently take off his saddle, and with a good quantity of Arsmart (which is an herb that grows almost in every ditch and standing water) rub him well on the back under the saddle, & afterward lay a good quantity of Arsmart under the saddle, and so ride him any

ny reasonable journey. These secrets I thought good to discover for the benefit of all English travellers, and I hope they are true because my authors are alive; and speak of their own experience, and not by bare report from others, they do also carry great probability with them. But now from the horse to the rider.

25. *A speedy or present drink which Travellers may make for themselves (ex tempore) when they are distressed for want of good beer and ale at their Inne.*

TAKE a quart of good water, put thereto five or six spoonfuls of good *aqua Composita*, which is strong of the Anniseeds, and an ounce of sugar with a branch of rosemary, brew them a pretty while out of one pot into another, and then is your drink prepared. Or if you leave out sugar it will be pleasing enough. I have been credibly informed, that divers Gentlemen of good credit when they travel abroad, and cannot like the taste or relish of their drink, that they use no other then the aforesaid composition, and find the same both to refresh and cool them very well; neither are they troubled with the rawnesse of cold water, by reason that it hath received some correction from the *aqua composita*, and that the anniseeds do give a delicate tast unto it. It were not amisse for all sea men to carry some store of *aqua Vitæ* with them, that when their wine, cider, perry, and beer are spent, they may transmute their water into the said drink.

26. *How any may safely put his finger or hand into molten lead without danger of burning.*

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Take

Take of Quick-silver 1 ounce, Bole Armoniack of the best 2 ounces, Camphire half an ounce, common *aqua vite* 2 ounces, first beat, and then mingle all these wel together with a pestle in a brazen mortar, then anoint your hands all over thoroughly well with this ointment, and be sure that your hands are clean without itch or scab. I did see a Dutchman called *Hance*, a pretty nimble Chymist, who after he had set some lead on the fire in a melting pot, till it became blewish and exceeding hot, he stirred the same with his forefinger up and down, pretending to see whether it were not too hot to indure in the palm of his hand, and afterwards telling his fellow that it was of a good temper, he caused him to pour the same out being some half pound in weight into the palm of his hand, first prepared as before, and presently he poured it into the other hand, and so out of one hand into another 5 or 6 times together, till in the end he threw the same cold upon the ground. This he did for a pot of the best Beer, in a garden in Southwark about 10 or 12 years since, in the presence of my self and divers others, at which time I writ the receipt even as I did both see him make it, and use it my self, disburfing the charge both of Beer and the ingredients.

27. *How any man may hold a hot iron Bar in his hand without burning his flesh.*

Dip your hand in molten glew (take heed the glew be not too hot) and presently strew the powder of horn burnt to ashes upon the glew, then dip your hand again in the glew, & strew more of the said powder thereon. Note that the thicker your bar is, the thicker crust you must make upon your hand.

This

This I learned of an old and skilfull man that yet liveth, and assured me that he had made often triall thereof. *Qre.* if this be not a good device to defend Mantle-trees, and other pieces of timber that stand near the fire, from burning. Take an equal proportion of fish-glew, and alom, mingle them wel together, the glew being first dissolved in wine vinegar, then parget over whatsoever thou wilt with this composition, and throw the same into the fire, and it shall not burn. This out of the secrets of *Wickerus* 110. See *Cardane de rerum varietate*, 644.

28. *Sweet and delicate Cakes made without either spice or sugar.*

Slice great and sweet Parsnip roots (such as are not seeded) into thin slices, and having washed & scraped them clean, then dry them and beat them into powder, searcing the same through a fine searce, (*Qre.* if there might not be some means found out for the grinding of them, whereby to make the greater riddance of quantity,) then knead two parts of fine flower with one part of this powder, and make some cakes thereof, and you shall find them to taste very daintily. I have eaten of these cakes divers times with very great good liking.

29. *How with one candle to make as great a light as otherwise with two or three of the same bigness.*

CAuse a round and double glasse to be made of a large size, and in fashion like a globe, but with a great round hole in the top, and in the concave part of the uppermost glasse place a Candle in a loose socket, and at some hole or pipe which must be made in the side thereof, fill the same with spirit of

wine, or some other clear distilled water that will not putrifie, and this one candle will give a great and wonderful light, somewhat resembling the sun beams. Note that this glasse is not much unlike to those wine drinking bowls that have false bottoms, wherein Sack, or Claret wine may be conveyed with fair water onely in the uppermost part of the cup; whereby a plain meaning man may easily be deceived. This conceit of a Candle, a Gentleman of good account, and my especial good friend did learn in Venice, where he was shewed the secret for a few French Crowns. *Qre.* What light a candle would shew if it were placed in a large Cilinder like unto a half Lanthorn, all of Latten kept bright and glistering, the same being inwardly garnished with divers steel looking glasses, so artificially placed, as that one might reflect unto another. I knew an expert Jeweller, dwelling (whilest he lived) in the Black Friers, who had a glasse with a round belly, and a flat back standing upon a foot, with a Lamp placed so at the backer part thereof, as that the light thereof was just opposite to the center of the belly, through which, the glasse being first filled with spirit of wine, there would so brim and glittering light appear, as that by the help therof he would grave any curious work in gold as well at midnight as at the noon day.

30. *How to make great posts and pieces of Timber that are to be driven into the earth, or piles for water works, to last much longer then otherwise they would.*

I Have heard that the Venetians whose houses do stand upon piles of wood, do use to burn or scorch the timber in a flaming fire, continually turning it round

round with some engine, until they have gotten a black and hard coalie crust upon it, and so they find it to last some hundreds of years, as it hath been reported unto me. A Kentish Knight of good worth did also assure me, that they use to burn in this manner the ends and points of their posts, which they drive into the ground, when they make their pales, and other inclosures. This secret carrieth great probability with it, for that by this means the outward part of the wood is brought both to such a hardness, and likewise to such a drinesse, *ut, cum omni putrefactio incipiat ab humido*, for want of moisture and sappiness, neither the element of earth, nor yet of water, can make any penetration into it.

31. *To make all the chops and clefts of green Timber to close again.*

A Noint or supple well the green Timber which you do expose into the aire, with the fat of powdered beef broth, and soak it well with the sponges or pensils into the clifts or chops thereof; do this twice over, and you shall find the same to answer my report. Some Carpenters do use to close up the great chops of wood, with greace and saw-dust mingled together, but the first I take to be the better way, for that I have thereby seen the timber to come so close together, as if it had never been wind-shaken at all. But note, that the Timber must be thus prepared in time, and whilest it is green.

32. *How to grave any arms, posies, or other device upon an egg shel, and how to through cut the same, with divers works and fancies, which will seem very strange to such as know not the manner of the doing thereof.*

Dip

Dip an egg in suet being molten, first the one half, and then the other, holding the same between your thumb and forefinger when you dip it; let the same cool in your hand, and being cold, with a sharp bodkin, or some other instrument of iron, work, or grave in the suet what letters or pourtraicture you will, taking away the suet clean, and leaving the shell bare at the bottom of your work. Then lay this egg thus ingraved in good wine vinegar, or strong alligar, in a glasse or stone Pottinger, for some 6 or 8 hours, or more, or less, according to the strength and sharpnesse of the vinegar; then take out the egg, and in water that is bloud warm, dissolve the suet from the egg, then lay your egg to cool, and the work will appear to be graven in the shell of a russet colour. *Sapius probatum.* And if the egg lie long enough in the vinegar, after it is so graven and covered with suet as before, the letters will appear upon the egg it self, being hard sodden. Or else, if you care not to lose the meat, you may pick out the same when the shell is through graven, and so you shal have a strange piece of work performed. These two latter conceits I learned of late, but I have not proved them: yet in all likelihood they should seem to be true.

33. *An appearance of strange forms in a glasse.*

GRind an Angel weight of fine leaf Gold with two ounces of *Sal Armoniack* upon a marble til you can scarcely discern any Gold; then take two parring Glasses, each of them containing a pint, in the one put the ground Gold with four ounces of good strong water, and in the other glasse put four ounces of Mercury with 8 ounces of *aqua fortis*, let both these

these glasse in warm ashes upon some furnace, till both the bodies be dissolved: then take a parting glass of a quart, and whilest the substances being dissolved are yet warm, pour the same into your quart glasse, but first you must put in your strong water wherein the Mercury was dissolved (I write according to the practise which I did see) and then pour the other water upon that, and presently you shall see an extreme thick blackness, which a Dutch Alchymist and practiser of Physick, that died of the last years plague (upon the discovery thereof) would maintain to be that *nigrum nigro nigrius*, so much spoken of amongst the Philosophers; and after a while, when the water began to be clear, then he termed it *calum cristalinum*; after that did appear a continual rising and falling as it were of flakes of snow, which continued certain hours; and then as it were a hill all covered with pearl, and that he called *sepulchrum Moysi*. All which composition having stood one night, there appeared divers spires like blades of corn or grasse, but of a whitish color in the bottom of the glass: yet in the end, by a reverberatory furnace, he turned all this great matter into a precipitate; and therefore it must needs be a Philosophical work that did end in so great an *arcanum*. Yet the same if it be truly performed, is worth the beholding, if it were to no other end, then to put us in mind of *Democritus* his *Atomi*, which concurring together, at length engender bodies. There is a like work to be performed in silver, whereby I have seen several forms and shapes of things sometime to spring up suddenly, and sometimes in a night or two, the same sometime representing trees, shrubs, hedges, and flowers, and divers other shapes: and notwithstanding many practises to

find out the reason of the differences of these forms, I could never yet make any one form twice, but that nature would play so infinitely, and at her own pleasure herein, as though I did observe a just proportion of all the ingredients of this magistery, yet (because she found some difference of peize when she weighed them in her own balance) I had always a several & differing form from the last which I made.

34. *A portable Ink, to be carried in the form of a powder, in any paper, leather purse, or box.*

IN Foster-lane, or among the refiners of gold and silver, get a large pan, such as they make their tests of bone ashes in; it is a deep dish made of burnt clay: into this put so much of the best and fattest coppres that you can get, set the same upon a trevet over a reasonable fire of charcoal; at the first it wil dissolve into a water, and after by continuing of your fire it will grow dryer and dryer: stir the same continually with a wooden spattle into the midst of the pan, and keep it from burning or hardning to the sides of the pan; and when it is thoroughly calcined into a whitish powder, and before it become red, take it from the fire. Then weigh out of this calcined coppres one part, one part of the best gals wel powdered, and half a part of the clearest gum *Arabick* well powdered also; searce them all through a fine searce, the finer the better, and it will not be amils if you use a lawn searce herein. Keep this powder in close boxes, and in the warmest places of your house; and when you will write therewith, put some of the powder into a spoon, adding thereunto some water, wine, beer, or vinegar, and stir it well together a pretty while, and
when

when it hath ferled a while, you may write therewith, and as it drieth it will grow blacker and blacker upon the paper, till in the end it become very legible. This I have often proved. Some commend dry Litmas scraped in water, and forced with a solution, wherewith to write instead of blew ink. But I think it not amisse first to dissolve gum Arabick in the water, to keep your ink the better from sinking. These sorts of inks are very good for the sea, because glassees are subject to breaking, and though you put your ink in leaden pots, yet in time it will thicken exceedingly, and then every man knows how troublesome it will be to the writer. I could here set down some other sorts of ink that be not common, whereof some wil fall from the paper in a few days, and others would corrode or fret the paper in pieces, but because I know but one good use of them all, and for that I fear so many bad uses, or rather abuses, would follow if they were known and made common, I will rather seem ignorant of them, then become an author or helper unto bad men in their bad purposes.

35. *How to write both blew and red letters at once, with one self same ink and pen, and upon the same paper.*

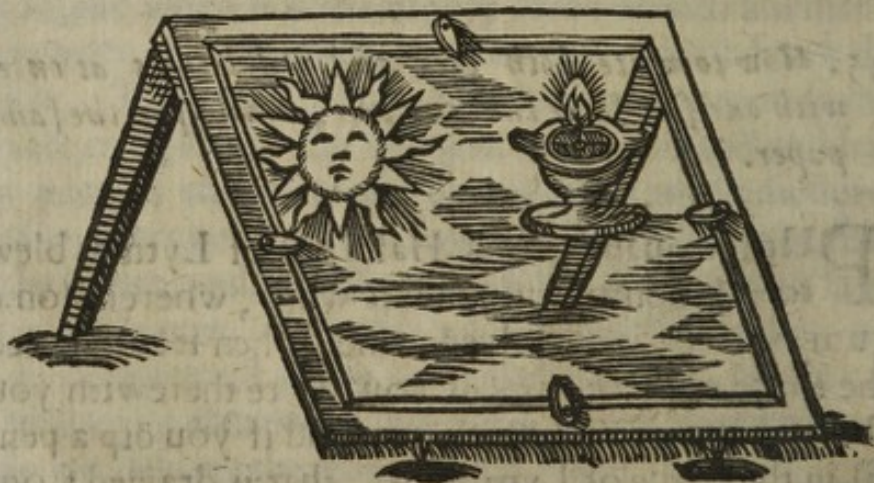
Put the quantity of a Halflunt of Lytmas blew to 3 Spoonfulls of conduit water, wherein some gum Arabick is dissolved, and when it hath ferled the space of one hour, if you write therewith you shall have perfect blew letters, and if you dip a pensil in the juyce of Lymmons, that is drained from his residence, and do wet some part of the paper there-

therewith, and after let your paper dry again, and then write upon the place where the juyce of the lymmon was laid, with your former blew ink, the letters will suddenly become red, and in all the rest of the paper the letters will be blew. And so you may also make party letters and other fancies, if you wet your paper accordingly. *Sapius probatum.*

36. To keep ink from freezing and moulding.

Put a few drops of *aqua vitae* therein, and then it will not freeze in the hardest winter that can happen, and in Summer time if you put salt therein, it will not wax mouldy, as I have been credibly informed.

37. How to draw any grosse pattern of any beast, fowl, Tree, Fruit, Flower, Personage, or other picture whatsoever.



You

YOU must have a desk of the clearest and evenest glass that is to be bought, yet I have seen our Sussex glasse to serve the turn sufficiently (and some use the skin of an abortive Lamb, finely dressed and streined stiff upon a frame) upon this desk you must fasten the pattern at the four ends with a little wax, upon which pattern lay the finest paper you can get for money, and wax that also upon the pattern as before. Then place your desk with the back thereof against a brim or perfect light, that hath no other opposite or side light to hinder it, and I think it best of all against a window where the sun shineth) and the pattern will shew all the lineaments thereof very perfectly through the fine paper, upon the which you may trick, either with a fine pointed cole, black lead or pen. *Qre.* Of a sufficient light to be placed under the desk by several lamps, if thereby also in a dark night, you may not discern how to perform your work perfectly.

Some instead of this desk do oil a paper and lay it upon a pattern, and draw thereon with black lead, and then prick the pattern full of holes and pounce it upon another paper. And some have patterns of beasts, birds, flowers, &c. prickt out in paper, and those they pounce also upon other paper. And this is a good and ready way for him that is not skilfull in the art of drawing, to garnish any plot which he had taken of any Manor, Park, Close, &c. with trees hedges, deere, housings, &c. But there is a way by a perspective glasse (which because it is consecrated to art, I dare not prophane the same too much by delivering it into unhallowed hands) whereby a young scholler may in 1 hours demonstration exactly draw and set down the lineaments of any live personage,

beast, or other fowl whatsoever, being placed at any reasonable distance from him, and so of any stately edifice or building, fort, bulwark, or fortification, and of all manner of engines, whatsoever the wit of any work-master is able either to actuate in the great or perform in the model onely. Yea all manner of drawn patterns whatsoever, be they never so great, may by the help of this glasse (whereof I have gotten the use at the hand of my dear friend) be lessened and brought within as narrow a Compass as a man would reasonably wish or desire. And whosoever shall advisedly practice by the help of this glasse, may in one months space be able to draw any patern by hand onely, without having need of the same any more. So likewise it is possible by way of reflexion, for any man to behold in a looking glasse, and that also in his private study, all the gestures and actions whatsoever any person shall make or perform, in any room or corner of his house, as also to see in the bottom of his seller whatsoever is done on the top of Pauls steeple, or any other steeple within London, so as his dwelling be within the City, or the liberties thereof, or within any competent number of miles distant from the same. But because I do see that every author is in danger to be censured according to the particular judgement of every Reader, and because *Stultorum plena sunt omnia*, I will not extend the credit of this secret to its uppermost bounds, but this shall be sufficient for the weak faith that reigneth in the world at this time.

38. Some helps for the speedier and true making and breaking of any letter, as also how a learner may write streight, and give some pretty grace unto his letters.

For

FOr the speedier attaining to any written hand, let some perfect writing Master deliver a few copies written, or rather broken in this manner. Let him divide or break each Letter into so many parts as he hath cause to make any little pause or addition before he finish the same; which is nothing else but the undoing and dis joining of the same, that a young Scholler may the better see which way the same was made up and brought together. As for example, the Secretary smal a, hath six parts before it be made up, the b. c. and d. have four, and some more, and some lesse: And for the better understanding of my whole meaning, I would have caused the whole Alphabet to have been cut, and so Printed in this manner, but that I could not stay the doing of it, and also for that I knew any Master of the science will perform the same with his pen, to any that shall be willing to requite his pains. Also it giveth a great grace to your writing, if the whites of certain letters be made of one equal bignesse with the o. supposing the same were all round, as the white of the b. of the a. p. y. v. w. x. q. d. g. and s. And for the writing straight, and true breaking of the letters, cause a paper to be ruled all over with great lines, drawn with a text pen, upon which ruled paper you must lay a leaf of the finest paper that can be gotten, such as they do commonly sell for two shillings four pence the quire, and let the scholler write upon the shadow of the text lines; or else if the neather paper be ruled full of small lines, when he writeth upon fine paper, let him have care, that those small lines may cut or divide those letters that he maketh, in the midst, and he shall find great use thereof. Some draw the letters first in black lead

or red ink, and then let their schollers run over them with black ink, until they have brought their hand in ure, with the shape and fashion of the letters. There is no doubt but that some willing and careful schollers will find some of these helps as good as the Ace of Hearts in their Writing; though other heedlesse Drones will scarce make the Ace of Diamonds of the best means that any Master or Teacher shall discover.

39. *A Gall water, very necessary to mingle with your Ink, as it groweth thick in your Standish or Inkhorn.*

Slice or beat some of the best galls, and put them in a glafs of fair water, and when they have given some reasonable tincture to the water, you may mix the same with your ink as it thickneth: this is a more kindly way, then to use either fair water, beer, or vinegar instead thereof. But when the water begins to be over old, and out of date, you must then throw away the same, and make fresh.

40. *How to renue old letters that be almost worn out of date.*

THis is performed by rubbing them over carefully with the gall water aforelaid, being well prepared, for that wil strike a fresh hue again into the old and outworn coppres. These two secrets I learned very lately of a skilfull and well conceited Gentleman, who hath made some practises thereof himself, and the first I can warrant by my own trial.

41. *How*

41. *How to speak by signs onely without the uttering of any word.*

DEvide 24 signs, whereof every one may represent some one of the 24 letters, but place your vowels for the more readinels in this manner; first A on the tip of your thumb on the left hand, E on the tip of your forefinger on the same hand, and so of the rest; so as when you lay the *index* or forefinger of your right hand on the tip of your thumb on the left hand, the party with whom you shall confer in this manner, may always note the same for an A. The rest of the letters which be consonants, may be understood by gestures, countenances, or actions, as an hem for a B, a cros made on the forehead for a C, a fillip for a D, and so of the rest. I have seen a Gentleman together with a Gentlewoman that were very ready in their conceited Alphabet, to deliver their minds to each other in this manner, whenas not any of the standers by understood either word or letter of their meaning. And I hold the same a necessary art to be practised of such as naturally lack their speech, by which they may be understood of others, which otherwise could have no natural conference with them.

42. *How to paint or lymn with the colours that are taken from herbs and flowers.*

Some dry the leaves of herbs or flowers, which carry any deep colour in them, and if there be several colours upon one leaf, they divide them, and keep each colour by it self, grinding the same upon a Marble, and after keep it in close glasses or leaded

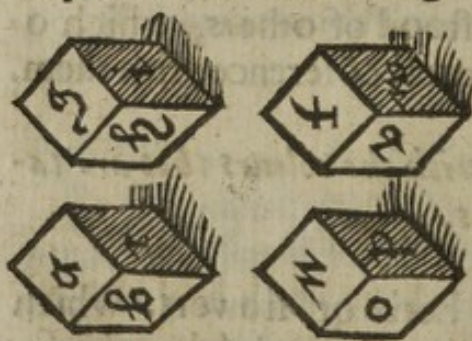
G

pots,

pots, sufficiently defended from the air. If you grind the leaves of a white rose with a little allom, it will give a yellow colour, and so will the purple part of the leaf of the flower de luce, ground with a little lime, yeeld a good and perfect green. Some expresse the juyce of herbs or flowers, and then evaporate either in balneo or in the sun so much as will ascend, spreading the rest thinly on the bottoms and sides of smal dishes, and after they set the same in the sun to dry, and then grind it with gum water as they have cause to use it. Some infuse the moist, and some the dry leaf with fair water, and so soon as the beautiful hew of the leaves begin to vade, they drein away the water and make an addition of fresh leaves thereunto, and so change their leaves often, that they may purchase to themselves nothing but the lively and bright tincture of every herb or flower.

44 *A ready way for children to learn their A. B. C.*

CAuse 4 large dice of bone or wood to be made, and upon every square, one of the smal letters of the cros row to be graven, but in some bigger shape, and the child using to play much with them,



and being alwayes told what letter chanceth, will soon gain his Alphabet, as it were by the way of sport or pastime. I have heard of a pair of cards, whereon most of the principall

Grammer rules have been printed, and the School-Master hath found good sport thereat with his schollers.

44. *To grave and inlay colours into Sol, Luna, Mars, or Venus, to shew in the nature of an Ammel.*

First cover your mettall with a crust of wax, and with a fine sharp tool when the same is cold, cut out the shape or proportion of what letters or other portraiture you please, and of some reasonable largnesse, then pour some strong water into those empty places, and when you find them deep enough graven, mingle Orpiment and Mastick melted together for a Yellow colour, and Vermillion with Mastick for a Red, and so of all other colours. Now when your Mastick hath been molten together with any of the aforesaid colours, let it cool, and beat the same into powder, and lay of that powder within the graving, and after lay the mettall upon the fire, till the Mastick melt, and it will remain fast and firm therein a long time. This of a Jew that yet liveth for ought I know.

45. *To makê bad paper bear ink in some reasonable manner.*

Rub your paper well over with the fine powder or dust of Rosen & Sandrach mingled in equal parts before you write therewith. Note that you must tie the powder hard in a rag of Lawn or thin Cambrick, and therewith rub the paper thoroughly well. This is a necessary secret for students, whereby they may note in the margents of their books, if the paper should happen to sink, which is an especial fault in many of our late years books.

46. *To make an egg to stand upon an end without any help at all.*

THere is an old tale of a good Workman who made an egg to stand in salt upon an end; but here the same is more artly performed, and yet without any such supportation. Hold an egg in your right hand, and with your fist give three or four good strong blows upon your left arm, or use any other devise by agitation or shaking, until you have broken the yolk, and so made the white to mingle confusedly with it, and then it will presently stand on the broad end on an even table. It should seem, that before the breaking of the yolk, the yolk did hang playing or tottering within the white, whereby the egg could not be made to stand speedily without this devise. And yet I heard a Gentleman, whom I dare beleeve in a greater matter then this, affirm, that he hath divers times caused an egg to stand alone by peizing it to and fro between his hands, till in the end it stood upright without any other help. But the first is the readier way.

47. *To harden the white of an Egg into an artificial Gum.*

Beat the Whites of divers Egges into a thin and clear oyl or water; put the same into bladders, and hang them in your Kitchin chimney, where a fire is usually kept in the day time, and in a few days the same will become as hard as gum Arabick. This I have often proved. Some perform the same in the sun onely. *Qre. to what use this gum will serve.*

Mr.

Mr. Wickes in his book of Secrets, fol. 532. lets down the fundry effects wrought by the severall degrees of fire; where we see a continual hot fire doth roast an egg till it become extream hard, but yet the nature of food remaining; an intermissive heat brings forth a gum altogether unfit for nourishment; and a gentle or natural heat engendreth a chicken that is good meat, but not before it hath received some alteration by an outward and elemental heat. I will not urge this Philosophical point of fire any further, only I wish, that he that is a true master of this element were my master also for a time.

48. *A Cheap Candle or Lamp for the poorer sort to use in their houses.*

Dip candle week in molten rosen, then wet your hands in water, and after you have dipt every week, you must stretch it out at length, or straighten it between your fingers, and so lay them to cool upon a halt pace or floor of stone. I think the refuse of old ropes and cordage would be a very profitable week for this purpose. This conclusion although it have been in some sort already published by mean persons both in Town and Countrey, and given over by the inconvenience of the excessive smoak onely, which annoieth the whole room exceedingly wherein it burneth; yet me thinks that during the dear price of tallow candles, the poor might make some shift or other with them, as either by setting the candles within the Chimney, or else in a candlestick over the mantletree, with a large wide tunnel made of wicker, and covered with paper, and having an elbow which might passe through some large hole in

to the chimney whereby the smoke may be avoided. These candles I know will not exceed half the price of the worst week candles that are to be bought. But for those that can content themselves with the light of a Lamp (and I am sure the same will serve for watching candles, and yet be more easier in price) let them buy Rape Oil, which for the most part may be had after two shillings the gallon, and therewith maintain their Lamps, using a small week of a few folds onely, or rather a Candle-rush in the socket of their Lamps, and so they shall find that one pint of oyl wil last them an hundred hours, whereas a pound of watching candles will be spent in threescore, or threescore and ten hours at the most, and yet they are dearer by one peny in the pound. Note that the week or rush must stand a litle sloping in the nose of your Lamp. Or if you would use your Lamp instead of a watching candle, and to maintain a light onely, then may you take a pretty large beer glasse, placing your week upon wier, being placed like a trefoil in the bottom, the wier it self being first thrust through a little round flat piece of Lead of the bignesse of a two peny piece of silver to make it stand the steadier. The week must be fastned to the wier with a thred of Cotten losely bound about it. When you have placed this week in the midst, then pour in either oyl or suet round about it, and so kindle your Lamp, & it will give some light allo through the glasse. Note that your glasse may not be too large, lest that the week grow to a coal before the oyl can consume away fast enough to give it passage unto fresh week thereby to maintain the light the better. But if you would have your lamp to last the longer, but to give no light at the sides, nor greatly at the top, then set
your

your glafs in a deep bafon or pot of water, thereby to keep the oil the cooler, and fo it will alfo laft the longer. And it is not amifs, nay it is very requifite to put in fome water into your glafs before you put in the oil, thereby to keep the oil from burning. Neither can I here omit or paffe over in filence that one more fpecial ufe of a Lamp than any candle can afford, which is the fafety of your light from being carried to and fro in the night time with rats and mice, which have often times fet mats on fire with the flame of a candle, as they have fought to convey it into their nefts. Neither would I willingly ftudy by any other candle, becaufe it continues fo long in one equal light, without giving that offence to the eie which the candle doth, by his prefent light after it is newly ropt; if it were poffible to have ftore of that oil of Beechmaf (which a late writer doth undertake to perform in great quantity from the nut, & which I have known expreffed in England, but not with fuch yeeld, the difference whereof, may peradventure be found in the diftinct natures of the Englifh and the Naple nut) or of that *Oleum Palmae*, which is taken at this day to be the oil that iffueth out of the Date-tree, the burning whereof is moft fweet and delicate in a Lamp, as I can teftifie by the trial of it fundry nights wherein I ufed no other watching candle in my bed Chamber. Let this fuffice to have fpoken of Lamps for this time, and untill I may obtain more leifure & more liberty, to lighten a new Lamp that will give more light then a Creflet, in fome of the darkeft corners of this land.

49. *How to refresh the colours of old pieces that be wrought in Oyl.*

SOME use to beat the dust off them with a Fox tail, or with a brush of feathers, and after rubbing them over with a Sponge or warm Urine. This way was commended to me by M. Bateman sometime Parson of Newington, a man whom for divers good parts that were in him, I can never sufficiently commend. Others rub them over lightly with a Sponge and fair water, and after there cometh no more soile, then with a Sponge and good old Linseed oil, wherein sometimes for the speedier drying, they do put some burnt Allom or powder of glass finely ground. Some do use first to wash over the pictures with soap, and presently after they be dry, to vernish them over. Note that all this is intended in pictures not vernished before. *Vide postea, Num. 72.*

50. *An excellent cement for broken glasses.*

TAKE one part of Virgin wax, and two parts of the tears or clear drops of Mastick, and cement therewith. But the better way is, if you beat the whitest fish glew you can get, with a hammer till it begin to wax clear, and cut the same into very small and short pieces, suffering the same to dissolve upon a gentle fire in a little leaded pan with a few drops of *Aqua vite*. Then let some other that stands by, hold both the pieces that are to be cemented over a Chafing-dish of coals till they be warm, and during their heat lay on the dissolved glew with a fine pensil, then bind the glass with wire or packthread, and let it rest till

till it be cold. With this cement I did see a Dutch Jeweller (dwelling in Black-Friers, but since departed this world) cement two of her Majesties chrystal cups that were broken. Some comend unflak'd lime, wheat flowr, and the white of an egg. Others do like fish-glew, with *aqua vite* and ceruse; or with the tears of Mastick, *aqua vite* and ceruse. A singular workman did highly commend unto me, Rhenish wine, and I singlals or fish-glew for this purpose.

51. *How to dry Gunpowder without all danger of fire.*

ALthough I hold not this for any great secret, yet because there hath much mischief & spoil of men happened onely by the wretchles drying of powder, I have thought it requisite and necessary in that respect, and for the prevention of dangers to come, to publish the same. Cause then a vessel either of Lead, Pewter, Latten, or Copper, to be made, having a double bottome, between which bottomes you may convey scalding water at a pipe, which water may also be heated in another room, for the more safety against the fire; and then you may lay your powder upon the uppermost bottome till it be dry: and when the water beginneth to cool, you may let it out at a cock in the bottome of the Vessel, and so give passage for more scalding water into the vessel by another cock which may be fastened in the pipe that runneth into the vessel. Or having a little pipe in the side, you may from time to time with a funnel pour in scalding water at your pleasure; and this is done both with lesse cost, and also lesse circumstance. I do use when I would dry my powder in hast, to heat a fire shovel by discretion, and then

I lay a paper thereon a pretty while, and if I see that the paper burn not, nor take fire, then I do spread my powder upon the paper, stirring it up and down till it leave smoaking: and this I have always found to be a very ready and a safe way. Some dry their powder in a stove, where no fire can come near to indanger it.

52. *To draw fish to a certain place in the night time, by a light or candle.*

Put so much filed lead into a Urinal as will make it sink, and upon the lead strew some herbs, and upon those herbs some Glo-worms, cover the glasse with a cork, and lute it well; and about the neck of the Urinal tie a string, which must be put through a great cork, that may keep the Urinal swimming in the water at what depth you please. Note that with some pipe or quill, you must convey some air into the glasse, for else the Glo-worms will die, and then I think their shining brightness will vanish away; and therefore those perpetual lights are meerly fabulous and fantastical, that are drawn from these distilled worms and Mercury together. Some nip or lute a glass having crude Mercury therein, and so hang it in the water as before. Also a candle held either even with the water, or sunk a little way into the water, will amaze and draw the fishes unto it, so as if you have a little hoop net, upon the end of a cane or pole, you may easily take them, and bring them to the brink-side. All these experiments are best performed in a dark night.

53. *A bait to catch fish with.*

To

TO half a hot half penny white loaf, take one ounce of Cockle seed (*Qre.* if *Coculus india* be not better) one ounce of Henbane seed finely powdered temper the same wel with strong *aqua composita* into a past, then divide your past into small pieces of the bignesse of a grain of wheat, and cast in a handfull of them at once, somewhat above the place where the fish do haunt, if it be in a river. This serves especially when you see the fish to float, but for the cheven you must make your baits as big as cherry stones, and put them in little coffins of paper, & then throw them upon the water. This secret I have not proved.

54. *How to drive fish into a Tramel.*

Pitch a tramel overthwart a river where there is good store of fish, then go upward against the stream a pretty way from the net, and as you come downward again with the stream, throw in some lime stones here and there dispersedly, on both the sides of the river. These unslak'd lime stones wil make such a crackling in the water, that no fish dare return back again upon them, but will run forward and mash themselves in the tramel. This I had of *John Hester*, one of the most ancient chimists of my time in London, in exchange of one other secret which I disclosed unto him. Yet some be of opinion that you must hurle in whole handfulls at once now and then, whereby the fish hearing so great noise, and tasting the strength thereof in the water, may be the more affrighted.

55. *Divers good baits to catch fish with.*

H 2

Fill

Fill a sheeps gut with small unflak'd limestones, and tie the same well at both ends that no water get therein, & if any pike devour it (as they are ravenous fish and very likely to do) she dieth in a short time, you may fasten it to a string if you please, and so let it float upon the water. Also the liver of every fish is a good bait to catch any fish of the same kind. Past made of wheat flower, a little saffron and some sugar, and tempered with water, is a good bait to angle withall for roch, dase, &c. Also if you gather dunghil worms, or from under a block, and take the earth from them, and put them into fine clean moss, suffering them to scour themselves three or four days therein, the fish will bite the better at them.

56. A ready way to catch Pigeons and other great birds.

Make smal coffins of paper, (such as the confit-makers use to put their confits in) not exceeding the length of ones finger, past the sides and ends with some starch, clip the upper part of them round with a pair of sheers, then anoint the inside of the uppermost skirts of them round about with birdlime in the form of a ring, and after you have procured the Pigeons to haunt a place, by making of a shrapa day or two before, lay of these coffins here and there with a few pease in every one of them a little sloping or declining, and strew some other pease amongst them. And when the Pigeon pecketh at the pease within the coffin, she is immediately masked or hooded, not seeing which way to flie. And so you shall find very good sport to take them easily.

57. *A worm to catch birds with.*

THere is a great opinion conceived of a Worm that hath many feet, and is found in a horse-mil, where corn is ground, most commonly under the ground where the horse treadeth, and is exceeding sweet; place this worm with limerwigs about her, where she may be seen, and you shal soon take birds therewith. But I take this rather to be the Worm wherein the Nightingale doth so much delight, which is found in a mil-case, or where Bakers use to bolt their meal.

58. *How to catch Pigeons, Crows, Iack-dawes, and Mag-pies.*

FOr the taking of Pigeons, you must make a shrap three or four days together, laying loose lines amongst the pease untill the Doves be acquainted therewith, then in some evening tie at those lines great store of strings, which with a needle before you must thrust through the pease, being first souden soft for the purpose, and at the end of every string tie a little knot, when a Pigeon hath swallowed down one of these pease, together with the string, she cannot possibly get it up again, but she is easily taken. Perhaps some other birds may also be taken in this manner. It is not amisse to hide the thread near the Pease with grasse, earth or straw, or some such like matter. Also if you throw gobbets of flesh or cheese curds abroad in the fields where there be store of Rooks, Crows, Daws, or Mag-pies, within the which there is conveyed some of the powder of Arsenick or

sublimate, yon shall soon dispatch your barns and other Garners of corn, of all these wastful birds. But take heed that none of your hogs do eat of these dead birds, lest they happen to poison them also.

59. How to kill Sea-pies, Sea-gulls, and other ravening water fowl,

Some be of opinion that if in the winter time, you do strein overthwart a river or brook, where Fowl do haunt some strong line or whipcord, at the which you may also hang divers other smaller threads, baited with garbage upon hooks, of an apt size for them, that so they will hang themselves, and be easily taken. Also for the taking store of sea-pies, you may lime some twigs which may be fastened at small fishes, and then lay the same upon large leaves, so as the lime touch not the water, and the sea-pie striking at the fish is taken with the lime twigs. And having taken one or two of them, then clip their wings, and so leave them in the water, and all the sea-pies therabouts that are within hearing, will come to help them, and continually flie hovering over them, so as having your pieces charged, you may discharge at the whole flock as fast as you can charge, for they will not be driven away.

60. How to gather great store of wasps together, so as you may destroy them all.

Some honey put into a Pipkin, and the same placed over a gentle fire, the windows of the room being set open, will by the scent and vapour thereof, draw all the Wasps that are near the place within any

any reasonable compasse into the room where you have bestowed the pot. Note that this must be done in an apt season of the year, when as there be store of wasps, and in some place where they haunt greatly. Also the wasps will soon resort to an earthen pot, wherein there is some raw flesh, and when you have drawn some store of them together into the pot, then cover it, and set it on the fire until you have destroyed them all. This latter secret I had out of *Cardanus de rerum varietate*, pag. 294. but the first is more natural, and commandeth further off. Also if you set store of jarre glasses in your Orchard, and about your house, where you see the greatest haunt of them, with some decoction of honey and water, or water and sugar, or any other sweet wine or composition in them, leaving these pots or glasses three parts empty, they wil not forsake these sweet liquors until they have drowned themselves therein.

61. *How to keep garments of cloath, or hangings of Tapisstry, Dornick, Saie, &c. from moath eating.*

BRush your apparel with an ordinary brush, and so likewise your hangings, or else you may use a brush made of a fig frale, until you have gotten all the dust out of them, then brush them over thoroughly well twice or thrice every year as they hang, with a brush made of Wormwood tops. And yet I think it to be the surer way, if they were also well rubbed with wormwood on the backsides. I have heard that it is a usual practise amongst the Italians here in England in summer time, to cause great store of walnut tree leaves to be hung upon a thread, so as one may not touch another, and when they are throngly dry,

dry, then strew them in their Chests and Presses, amongst their cloaths and other furniture of their chambers and beds, and within the several folds of every garment.

62. To help beer that beginneth to sour, or is dead.

Some put a handful or two of ground malt into a barrel of beer, and stir the same and the Beer well together, and so make it to work a fresh and become good again. Some do bury four beer 24 hours in the earth, and thereby recover it. Others adde new strong beer to the old, and so the dead beer is forced sometimes to work again to a new head. Some fetch it again with chalk or lime, and some with oyster shells; and some throw a handfull of salt into a barrel of dead beer. A Lady in this land hath always used to put in a handful of oatmeal into every barrel of beer, when it was first laid into her sellar, whereby her drink did always carry with it a quick and a lively taste. It is very good also to tilt your beer, when the vessel is little more then half drawn off, for so shall you draw your beer good even to the latter end.

63. To help a chimney that is on fire, presently.

When you see the chimney on fire, forthwith get a large thick blanket or coverlet, and with the help of two or three persons, let the same be held close both above and below unto the mouth of the chimney, so as no air may enter; and if you can come easily to the top of the chimney, cover the same close also, either with a fit board, or else with wet woollen cloths, and so the fire wanting air will presently go out, and be smothered.

64. *To have store of Sea-fish for the provision of ones table, without repairing to the sea for them.*

SIR Edward Hobby (as I have heard) hath stored certain dikes in the Isle of Sheppey, with sundry kinds of Sea-fish, into which dikes by sluices, he doth let in from time to time, change of sea-water to nourish them.

65. *To make ale or beer to become stale in a short time.*

Bottle ale, or bottle beer, being buried somewhat deep in the ground, in a cool or shady place, becommeth stale enough to be drunken in 48. hours space, as I have been informed by an honest and sober Courtier.

66. *How to steal Bees.*

IF you place a Bee-hive somewhat before swarming time in the midst of a great Beechtree, so close as that it may not be discerned for fear of stealing, the bees will resort unto the same, especially if it be first well sprinkled with water and honey.

67. *How to make a tallow candle to last much longer then it doth in our usual manner.*

A Neapolitane hath written that salt mingled with oyl wil make it to double his lasting, but I think the practiser hereof will find it somewhat troublesome to make a good solution of salt in oyl, for oyl is an improper subject to retain salt. I have heard an Irish practitioner affirm, that if tallow candles be made about Alhallontide of good stuff, and
I presently

presently laid in cold water by the space of 24 hours together, and then hung up to dry in a cold and windy place upon their sticks, that by this means onely they wil last much longer than otherwise they would and burn also much sweeter. But I am sure that if there be a true counterpeize given to a short tallow candle, (such as is usually called the Goldsmiths candle) and the same afterwards let down between ones fingers, into the midst of a pail or tub of water, so carefully, as that the flame be not extinguished in letting the same fall into the water, it will last as long as two candles of the same length and bigness, always supporting it self above the water by a thin crust or web, which it worketh about the flame in the nature of Camphire, which continueth his burning in the water (being once set on fire) until it have wrought a passage or entry for the water into it self.

68. *How to tell the just number of apples, nuts, shillings, &c. as they lie in bulk together, how great soever the heap be.*

CAuse the owner of them to dispose of the whole heap in this manner. First wil him to lay down two, then let him double that number likewise, and so continue in the rule of duplication, until he can double no longer, lay all the odd ones apart by themselves, then shal you easily guess by the present view of the whole number, how many there are in the whole heap. For either they must be 2, 4, 8, 16, 32, 64, 128, &c. and which of these numbers soever it be, every reasonable eye wil guess, the bulk of the one number doth so much surmount the other. The like also may be done in trebling, and now and then in doubling or trebling, the more to obscure the conceit.

69. *How*

69. *How to prevent Drunkenness,*

DRink first a good large draught of Sallet Oyl, for that will float upon the Wine which you shall drink, and suppresses the spirits from ascending into the brain. Also what quantity soever of new milk you drink first, you may well drink thrice as much wine after, without danger of being drunk: But how sick you shall be with this prevention, I will not here determine; neither would I have set down this experiment, but onely for the help of such modest drinkers as onely in company are drawn, or rather enforced to pledge in full bolles such quaffing companions as they would be loth to offend, and will require reason at their hands, as they term it.

70. *An excellent Tent for a Diamond.*

Burn Ivory in a Crucible, or melting pot, being close luted, into a black powder; then take a little of the fine powder thereof, and mingle it with a few drops of the extracted oyl of Mastick, and in the setting of the stone, you must have care that it touch not the Tent.

71. *How to make Oyl or Vernish to dry speedily.*

THis is done first by boiling of the oyl to the consumption of the one half, or one third thereof, and then by the putting in the ashes of the back-bones of Shads or Mackerel; also divers Shads heads dried in the wind, and hung up in a dark place, will glister like glow worms.

72. *A strong Lee that wil fetch out any stain, as also refresh an old Oil Picture, and make it very fair again.*

I 2

Take

TAKE of the ashes of the Vine one handfull, of white coppres and burnt allom, of each the quantity of half a Walnut, put thereto a pint of conduit water, infuse the same upon the said substances in an Ipocras bag, and reiterate the water upon them 4 or 5 times, til it grow very strong; set the said water on the fire, and put thereto the quantity of an hannel nur of good sope; then take the said Lee so hot as you may wel endure your hand therein, and after you have taken off the dust from the picture with some brush or fox-tail, rub over the picture with a sponge till it come to a good lustre with the said Lee, and when the colours please you, then with fair water wash off the said Lee again, and the peece or picture though never so old, will become very fresh. *Qre.* if this secret do not onely extend to such oyl peeces as are not varnished. Some rub over pictures or tables with an Onion cut through the middest. This secret with the precedent I had of a Dutch Mountebank, and they came so hardly from him as if he had been extreamly costive. *Vide antea, num. 49.*

73. *To help wine that reboileth.*

IF any sweet Wines happen to reboil in the hot part of the Summer (as I have often seen, and as many Vintners to their great losse have oftentimes felt) then *Placentius* willeth a little peece or cantle of Cheele to be put into the Vessel, and presently a strange effect will follow. *Hoc ex anchora famis & fitis.* I beleieve that the Corporation of Vintners would give twenty pound yearly to have this secret warranted to be true: For the best remedy which they have, is, to draw the Wine off from the Lee in-

to other clean cask, thereby perswading themselves to cool the Wine, and to stay the boyling thereof: But after a while, the inward fire oftentimes begins a fresh workmanship, and frustratesh all their labour. I would esteem him for a learned Vintner, and worthy to have the next avoidance of Bacchus his Chair, that could give me the true reason of this reboiling of Wines. But because I have allotted so great a place of honor to him that can but shew the reason onely thereof, therefore I will not presume nor profess to know the cause efficient, but I durst undertake to perform the remedy, if I thought my reward would not be somewhat like unto his, that within this few years taught divers of the Company how to draw out of a Hogshead of Wine lees, 10 gallons of clear Wine at the least, which being trickt or compassed, or at the least mingled with other Wine, hath ever since by divers Vintners been retailed for Wine, whereas before it was wholly sold for Lees to the *aqua vite* men. And this is the reason why there hath never since been the like store of Lees to make *aqua vite* of, as before the discovery of this conceit, and that the lees of many Cellars which before were liquid, are now become stiff like paste, and may very wel be wrought up into the form of bals. And if I be not deceived, the first practise thereof began in Pater Noster row, and within these few years; but I fear by this time it is a patcel of many mens Creed, that wil never be left til the worlds end. Wel, the poor fellow got hardly a good sute of apparel amongst divers of them to whom he disclosed the secret, though some one of them could tel which way presently to raise 30 or 40 *l. per annum* unto themselves. And therefore I see it is no offering of skill in

these days to Vintners. But the better course were to take a Tavern, and get a Hollibush, if France were more open, and a little more freed of the excessive impost, and so to draw wines as artificially as the best of them. For I can assure you I have almost the whole art as it is this day in use amongst the Vintners, written in a pretty volumn intituled, *Secreta dei pampinei*. And if I durst here so boldly as I could, both truly and largely write of these jumbling flights, that are too too often practised in our natural wines, by some of the Coopers of London, to the great benefit of the Merchant and Vintner, although themselves poor souls, get nothing thereby but the hooping of the vessels, and now and then a can of wine for their labours, a man would wonder from whence such great variety of juggling should grow or spring, and how these plain fellows that never read their Grammer, nor scarcely know their A.B.C. should be able to run through *Ovids Metamorphosis* as they do at midnight. And yet I cannot altogether blame either the Cooper or the Vintners man for practising of these alterations, transmutations, and sometimes even real transubstantiations of white wine into Clarer, and old lags of Sacks or Malmseys, with Malasses into Muskadels. For we are grown so nice in tast, that almost no wines unlesse they be more pleasant then they can be of the grape wil content us, nay no colour unless it be perfect fine and bright wil satisfie our wanton eys, whereupon as I have been credibly informed by some that have seen the practise in Spain, they are forced even there to interlace now and then a lay of Lime with the Sack grape in the expression, thereby to bring their Sacks to be of a more white colour into England then is natural unto them,

them, or then the Spaniards themselves will brook or indure, who will drink no other Sacks then such as be of an Amber colour. This makes the Vintners to trick or compass all their natural wines if they be a little hard, with Bastard to make them sweeter, if they prick a little they have a decoction of honey with a few Cloves to deceive the tast, if they be cloudy or not perfect fine, they give them either the white or the yellow parrel, according to the natural colour of the wines, wherein they must use eggs, milk, Bay-salt, and conduit water, well beaten and laboured together with a stubbed rod, and then wrought soundly together with a parrelling staff, which parrel for the most part in one night (unless the wines happen to have a flickering Lee) wil cause them to fine, whereby you may presently draw at a certain. But this is dangerous unless it be in a house well customed, for that the wine may not lie too long upon his parrel. And some wines wil not indure long after you have raked them from their parrel. Note the wholsomnes of these Lees to make *aqua vite* withal. But when the wines do rope or begin to fail or faint in themselves either in substance or colour, either by age, by the fault of cask, soyl, salt water, or other accident, then many times the Vintner is driven to his hard shifts, and then he helpeth himself with allom, with Turnsole, Starch, and with many other drugs, and aromatical ware, which he fetcheth from the Apothecary, the particulars whereof I could set down and apply even as they have been a long time (till within these few years) practised in one of the most authentique Taverns of my time. But my purpose is onely to put some in mind of their gross night works which discover themselves by candle light at their cellar windows

dows, wishing them to leave all unwhollom practises for mans body, lest if they should hereafter force me against my will to publish them to the world, I should draw my country men into such a liking of our Roiston grape, that in the end they would for the most part content themselves with their English and natural drink, without ranging so far for forraign wines.

74. The making of a Bragget, which is many times mistaken for a Munkadel by the simple sort of people.

Put one part of smal Alewort that is bloud warm with one part of clarified hony according to the manner set down, *num. 75.* but put no Cloves therein in the clarifying. For the making of one Hogthead of this Bragget which is about 63 gallons, you must take nine gallons of this clarified honey, and 54 gallons of strong new ale: when your clarified honey hath stood one day, then mingle the same with your new ale in a Hogthead, first filling your Hogthead half full before you put in your honey, and then hang this aromatical composition in a long slender bag in the midst of the vessel, viz. of Cinamon 3 ounces, Ginger 3 ounces, Greins 3 ounces, Colianders 1 ounce, Cloves 1 ounce, Nutmegs 1 ounce, long Pepper half an ounce, *Cardamomum* one ounce and a half, Liquorice 1 ounce, then fill up the vessel almost full with the best of the new ale (yet some commend rather the putting in of the spices confusedly then in a bag) be sure to have 4 or 5 gallons or more of the same new ale, to fill up the Hogthead as it purges over continually. There is a lesser hole near the bung hole in beer Hogtheads, which must stand open while

lest it purgeth, you must also be carefull in the beginning to give some little vent to the hogthead whilst it worketh: in three or four moneths it will be ready to drink. You must have a hazel stick of the bignesse of a good cudgel, so great as may well enter in at the round bung hole, and when your Hogthead is about three quarters full, put in this stick, being sawed cross wise at the end about one cubit in length (the Vintners call it their parelling staffe) as the aptest tool for this purpose. Beat with the said staffe the new ale and the honey together a good pretty while, and when you have finished this agitation, fill up the vessel with the rest, and let it purge as before. If you find your muskadel too thick after it hath stood 2 or 3 moneths, you may take a cane or pipe, made of tin plates, that will reach into the midst of the hogthead or somewhat more, stop the end thereof, and make some holes in the sides, and with a funnel you may pour more new ale into the Cane, and so make it thinner. The cane is an apt instrument to convey any liquor or composition into a vessel of wine without troubling of the same, or turning up the lees, whereby you may draw the same fine presently.

75. *How to clarifie honey so that the taste thereof shall be much altered.*

PUt a gallon of water bloud-warm to a gallon of hony, put in your hony first, and with a stick take the depth thereof in the vessel wherein you boil it, and then put half an ounce of beaten cloves bound in a linnen cloth therein, and let them boil with the water and honey on a gentle fire till all the water be consumed, which you shall guesse at by this mark

on the stick. Your hony must be sure and simple, not mingled with wort, flowr, or other bad composition, even as it is gathered upon the breaking up of the hives. It is a work of two or three hours, and the elder the honey is, the better it serves for this purpose: you must remember to take away the skum as it riseth. Some boil this hony a little higher to a more consistency, and preserve fruit therewith instead of sugar. These two receipts I had of an Oxford scholler, who assured me that he had often made proof thereof in the City of Oxford, and I know the man to be both of good conceit, and very carefull in the commendation of any secret to his friend, otherwise then may well stand with his own credit.

76. *A Receipt for the making an Artificial Malmsey.*

TAKE 4 gallons of conduit water, into the which put 1 gallon of good English hony, stir the hony well, til it be dissolved in the water, let this water in a copper pan upon a gentle fire, and as there ariseth any skum take it off with a goose wing or skummer, and when it hath simmered about an hour, then put in a new laid egg into the water, which will sink presently, then continue your first fire without any great increase, and also your skimming so long as any skum doth arise, and when this egg begins to float aloft and sinketh no more, then put in another new laid egg, which will sink likewise, and when that second egg doth also swim aloft with the first egg, let the water continue on the fire a *Pater noster* while, then take it off, and being cold, put the same into some roundlet, filling the roundlet brim full. And in the midst of this roundlet hang a bag, wherein first put
some

some reasonable weight or peize, and to every eight gallons of liquor, two nutmegs grossly beaten, twenty Cloves, a rale or two of Ginger, and a stick of Cinamon of a finger length. Set your roundlet in the sun, in some hot leads or other place, where the sun shines continually for three whole moneths, covering the bung hole from the rain, and now and then filling it up with more of the same composition as it wasteth. This I learned of an English traveller, who advised me to make the same always about the midst of May, that it might have 3 hot moneths together to work it to his full perfection. But lest this way should happen to fail you, I have thought good for thy better security to let down my own fancy, for the easier stirring up of this Malmsey to his workmanship. Let your vessel be such as hath already contained some must, or other liquor that hath wrought therein (for he that knoweth not the use of a worker is but a slender Artist) stop the same very close, and lay it in a convenient cellar till it hath wrought sufficiently, but in the working give the cask vent by degrees, for fear of after claps. Or else you may easily procure the same to work, by adding of some yeast or ferment unto it, and setting it warm according to the usual manner of ale and beer.

77. *How to keep Claret wine, or any other wine good many years together.*

AT every Vintage you must draw off almost a fourth part out of the hogthead, and then rowl it upon his Lee, and after fill it up with the best new wine of the same kind, that you can get. Your cask must be bound with iron bands or hoops, and always

kept full and tight. I have heard that an Essex Knight useth this practise, and hath wine of nine or ten leaves (as they term it) which is so many years old.

78. *To keep walnuts green and moist a long time, so as you may pill the kernel.*

TAKE the stamping of crabs after the Verjuyce is expressed from them, lay your nuts therein one by one, so as they touch not one another, and so make *stratum superstratum*, till your vessel be full; these will last some two or three moneths, as I have been credibly informed by a Gentlewoman that made good proof thereof.

79. *How to keep the gloss of Spanish leather shoes, or buskins, a long time.*

THE blacking of a lamp tempered with the oyl of Almonds, or some other sweet oyl, is very good for this purpose. I know a Gentleman that doth use to rub his Spanish leather shoes with the back-side of a piece of Frieze-leather, but you must have care to keep this kind of leather very dry. Some maintain the gloss of this leather with a piece of black velvet only

80. *How to help smoaking Chimneys.*

IF the Chimneys be large, and carry some good length and breadth with them, then may you erect and build a false back and sides to your smoaking chimneys, so as there may be a distance of three or four inches between the old back and the new, raise this new work a foot above the mantle-tree.

81. *Tinder*

81. *Tinder and match of a new kind, and sweet.*

TAke the light and thin shavings of dry fir boards, light them with a candle, and when they are almost burnt, put them out as you would do Linnen rags, after the flame is past in a stone por. Then lay another thin shaving thereon, and with a steel and flint stone, strike fire into this tinder, and blow therein till this new shaving do kindle, and so light your candle; and then put out this last shaving in some reasonable time, and it will help to increafe your tinder. This I have seen a Dutch Joyner use oftentimes in the lighting of his candle. Note here that your match and your tinder is all of one substance or matter. Also you may make sweet matches to your ordinary tinder in this manner; Cut or thwite a number of small Juniper sticks, with sharp points like tooth-picks, and dip them but a little way, and that very lightly, in brimstone, and when the brimstone is spent the Juniper will burn sweetly.

82. *An excellent mixture to make pewter bright withall, and to take out the stains.*

TO a gallon of strong buck Lee, put half a pound of black sope, and a reasonable handfull of the dust of Flanders tile, which you shall make by rubbing one against another. Boil them well together till they become like pap or Birdlime. This will last a whole year: You must onely have care to bestow good store of labour upon the vessel if you mean to use this scowring.

83. *To defend a Horse from flies in his travel.*

K 3

Steep

Steep Arismart in water, making the water very strong of the herb, and therewith wash your horse before you mean to travel.

84. *To kill Rats in a Garner.*

BE sure there be no holes in the bottome or sides of your Garner, or any where else, saving above the boards which you must place shelving wise, or in the manner of a penthouse throughout the garner, about half a yard or two foot from the corn, so as when the Rats have leaped down into the bulk of corn, then they shall not be able to rise or bolt up again before you have sped them.

85. *How to take away the offence of noisome Vault.*

MAke the vent therof upward as large or larger then the tunnel downward, and carry the same up to a convenient heighth, for so the offensive air as fast as it rises hath issue, and stays not in the passage.

86. *Sweet and delicate dentrifices or rubbers for the teeth.*

Dissolve in four ounces of warm water, three or four drams of gum Dragagant, and in one night this will become a thick substance like gelly, mingle the same with the powder of Alabaster finely ground and searfed, then make up this substance into little round roles of 4 or 5 inches in length. Also if you temper roset, or some other colour that is not hurtfull with them, they will shew full of pleasing veins. These you may sweeten either with rose-water, civet or musk. But if your teeth be very scaly, let some expert Barber first take of the scales with his instrument,

ment, and then you may keep them clean with the aforelaid rowls. And here by those miserable examples that I have seen in some of my nearest friends, I am inforced to admonish all men to be carefull, how they suffer their teeth to be made white with any *aqua fortis*, which is the Barbers usual water; for unless the same be both well delayed, and carefully applied, a man within a few dressings, may be driven to borrow a rank of teeth to eat his dinner with, unless his gums do help him the better.

87, *To keep either man or horse that is tender in the foot or hoof, whereby they cannot indure any great travel.*

LEt him that travelles much, and hath this infirmity, put in each sock before he draw on his hose a new laid egg somewhat grossly broken, and so let him travel upon them. So likewise you must put in two eggs a little beaten into either hoof of the horse, and clap cow dung upon them, and then wrap them well one night that they fall not out, and after you may travel him any reasonable journey. This is much used in Italy.

88. *How to keep Oysters good 10 or 12 days.*

SOm hold opinion that if you barrel them up whilst they are new and quick at the sea side, putting some of the brackish water where they are taken amongst them, that so they will last many days good. *Qre.* Of dissolving of some salt in fresh water, til it be of one strength with the brackish, which containeth some eighteenth or twentieth part of salt, peradventure it will not be amisse to change your brine now and then. Some pile them up in small roundlets with the hollow parts of the shels upward, casting
salt

salt among them at every lay which they make. This is a good device to send them far into the Country, where oysters are dainty, and sold by tale.

89. *To keep Lobsters, Craw-fishes, Prawns, Shrimps, &c. sweet and good for some few days.*

THese kind of fish are wel noted to be of no durability or lasting in warm weather, yet to prolong their days a little (though I fear I shal raise the price of them by this discovery amongst the Fish-mongers, who onely in respect of their speedy decay do now and then afford a penniworth in them) if you wrap them in sweet and course rags, first moistened in salt water, and then bury these cloaths in Callis sand, that is also kept in some cool and moist place, I know by my own experience that you shal find your labour well bestowed, and the rather if you lay them in several cloths so as one do not touch the other.

90. *An artificial composition wherewith to make smooth glistering and hard floors, or to plaister wals with.*

TEmper Ox-bloud and fine clay together, & lay the same in any floor or wal, and it wil become a very strong and binding substance, as I have been told by a Gentleman stranger, who affirmed unto me that the same is of great use in *Italy*.

91. *To make Parchment clear and transparent to serve for divers purposes.*

MAke choice of the finest and thinnest parchment you can get, scrape the same over with a knife

knife till it become very thin, (but first you must wet it well in water) then strain it upon a frame, and fasten it well, and when it is dry, oyl it all over with a pensil, with the oyl of sweet Almonds, oyl of Turpentine, or oil of Spike, some content themselves with Linseed oyl, and when it thorow dry, it will shew very clear and serve in windows instead of glasse, especially in such rooms as are subject to overseers. You may draw any personage, beast, tree, flower, or coat of armour upon the parchment before it be oiled, & then cutting your Parchment into square panes and making slight frames for them, they will make a pretty shew in windows, and keep the room very warm. This I commend before oiled paper, because it is more lasting, and wil indure the blustering and stormy weather much better then paper.

92. *A profitable and cheap Morter for building, wherein either no Lime, or smal store of Lime shal be requisite.*

A Wise, wealthy, and ancient Sope-boiler, dwelling without Algate, hath for the better encouragement for others, long since erected a fair and stately edifice of brick for his own habitation, upon the good successe whereof, he hath also very lately built one other house of some charge and good receipt, the morter whereof did consist of two loads of wast Sope ashes, one load of Lime, one load of loam, and one load of Woolwich sand. So likewise one other of the same faculty, being likewise of good credit and great experience, hath used onely loam and sope-ashes tempered and wrought together instead of morter, whereby he hath laid both the foundations, chimneys, and their tunnels in his dwelling house

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in Southwark, and they have endured those storms already which have overturned many others, both new and old runnels, that hath been built with the ordinary mortar. It may be some Lime-men, and some of those Bricklayers that are in fee with them, may bend their force against this new practise, and labour to discredit the same by all means possible but there is no reason that can hold against experience, nor no malice so great, but that truth in her time shall be able to vanquish. And if these three trials shall not be thought a competent number to give credit to a new invention, I will upon reasonable request and warning, back and confirm them with threescore more at the least, which I can produce, already made and executed within the City of London, and the Suburbs thereof; insomuch that whosoever will take a carefull view of our late buildings that consist of Brick-work (especially within the Suburbs of the City) he shall find great store of these waste ashes to be employed in them.

93. *A conceited drinking glass, wherein many sorts of fish will be seen to swim up and down.*

IN the midst of a good large drinking glasse, and of a bole fashion, let a short pillar of glasse arise, upon the which a round globe or ball of glasse must be placed, upon which ball there must be divers sorts of small fishes well drawn and limned, then fill the glasse either with water, or with White, or Rhenish Wine, and the least motion that can happen either to the Wine or water, will make the fishes seem to play up and down within the glasse.

94. How to dissolve Gold, or part it from guilt Silver, without melting down the Silver.

Dissolve some *Sal Armoniack* in some good *Aqua fortis*, whose faeces (fixes the Goldsmiths improperly term them) have been first stricken down with some fine silver, or else distil by retort the said *Aqua fortis* thro' good store of Bay salt first calcined; set some of this water in a parting glasse upon warm embers, and put therein your guilt silver, and it will stand in the form of a golden water. You may gather your gold again either by evaporation of the water, and so the gold will settle in the bottome; or else if you put Mercury therein, it will amalgame with it, which Mercury will soon fly away in fume, being put into a crucible, and leave the gold behind. I hold this to be a very profitable secret for the Goldsmith, unless the Mercury in the first gilding of the silver, convey some part of the gold so far within the silver as that the water can make no sufficient penetration unto it: For by this means all the charge of testing and parting will be saved, which (as I take it) will not be much less then four pence upon every ounce. But whereas it hath been objected by some refiners, that by this means there will be much gold lost (especially in such ancient plate as hath been made, and perhaps melted down again, before the art of refining, which is of a *puiſne date*, was found out, for that this water doth onely take hold of such gold as invirones the outside of the silver, I hold this to be a weak objection to discourage any man from the practise of this solution, for that in such plate as either carrieth no touch, or so old a touch as the buyer shall not be acquainted withall, he may follow the old refining

rules: and in such guilt plate as hath been made since the art of refining hath first been used amongst us, (which is the most usual plate that is bought and sold in these days) he shall find the same a most beneficial practise, if the first doubt may be salved, which may easily be proved in one ounce or two of guilt silver, making a straight observation how much gold was bestowed thereon.

95. How to know when the Moon is at the full by a glass of salt water.

IT hath been credibly reported unto me, that if an ordinary drinking glass be filled brim full, a little before the full of the Moon, that, even at that instant when the Moon commeth to the full, the water will presently boil over.

96. How to melt down the filings of Iron, nails, or other small peeces of Iron with a small fire.

TO three parts of Iron put one fourth part of Antimony powdered, in a crucible or melting pot; set the same in any ordinary fornace, and blow a little with a pair of bellows, (or else for your more ease, you may use a wind fornace) and you shall find the same to melt very speedily. This way you may easily cast both Musket and Caliver bullets of Iron.

97. How to put several Liquors or Wines into one Glass, without mixing.

TAKE a Beer glass of 6 or 8 inches in height, and being of one equal bignesse from the bottom to the top; then pour therein some fair Water,

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an inch or two in height, upon the which lay a round trencher that is almost equal in compals with the glass. Then out of a long spouted glass or pot, pour gently some milk upon the trencher, and after that some Rochel or Conniack white wine, and then some Galcoign claret wine, and after Sack; and so you shal have each liquor or wine to flote upon the other without mingling together, because the fall thereof is broken by means of the gentle pouring upon the trencher. Some hold opinion that the same may also be performed with a round toast. But I think that you must have a special care herein, that the heaviest liquor do lie in the bottom, and that you proceed from lighter to lighter, so as the lightest, or most ~~x~~rious or fiery be placed uppermost, for each thing desireth to be in his natural place.

98. *The Art of Memory which Master Dickson the Scot taught of late years in England, and whereof he hath written a figurative and obscure Treatise, set down briefly, and in plain terms, according to his own demonstration, with the especial uses thereof.*

YOU must make choice of some large edifice or building, whole chambers or galleries be of some reasonable receipt, and so familiar unto you, as that every part of each of them may present it self readily unto the eys of your mind when you call for them. In every of these rooms you must place ten several subjects at a reasonable distance one from the other, lest the nearnesse of their placing should happen to confound your memory. Your subjects must consist of Decades, whereof the first is a man, and the fifth a woman, or rather the wife of that man which beginneth the Decade. And by that means your first,

your fifth, your tenth, your fifteenth, and your twentieth subject, &c. both forward and backward is easily brought to mind. The rest of the subjects in every Decade may be such as are meerly differing the one from the other, unless you shal like to have some few of them resembling the profession of him that begins the Decade. As for example, if you begin with the Souldier, you may take a Drum & a Target for two of the subjects in that Decade. But if you place too many subjects of one nature within one Decade, you wil find them very troublesome to remember. These subjects would be such as are most apt either to be agents or patients, upon whatsoever you shall have cause to place in them; and therefore Fire, a Dunghil, a Cart, a pair of Bellows, a Tub of water, an Ape, a Ship, a night Gown, a Millstone, and such like, are apt to make your subjects of, wherein you may place all such things as you would remember, and as M. Dickson termed it, to animate the *umbras*, or *ideas rerum memorandarū*. But herein every man may best please his wit and memory. Now to proceed to the placing of these ten subjects in their ten local rooms, you may begin with a Souldier, whom you may place even in the door or entrance, confronting with a stern and warlike look all such as shall offer to enter that room wherof he takes the charge; you may also imagine him with flask, touch-box, morion, piece, sword and dagger, &c. because you may happily have occasion in the placing of some hard word, to use some one of these more fitly then the other. Your second place may be your Bedstead (if happily that stand next your door) at the head of which you may by a strong imagination place an extream burning Fire, and at the feet thereof a great and smoking Dunghil.

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In your Chimney (it that likewise be next your bed, and a competent distance from the bed) you may imagine a tub full of water. Then in your window, being the next fit place, you may imagine Bellona staring with her fiery eys, and portraied in all points according to the usual description of the Poets. Then upon your Court cupboard, you may place an Ape with her clog, and in another window (if your chamber have two windows) a Ship under sail with all her tackle, Upon your Chair you may imagine a night Gown furred with Fox skin, having wide sleeves, and great pockets belonging to the same. Then upon your table standing in the midst of the room, you may place a Millstone or a Drum, and in the top of the feeling over your table, a Target, a Sword, or a Lute hanging downward. And if you want places, you may make either side of your windows to be one, and so of your Chimny. But here you must have an especial care, beginning at the door of your chamber, to take the places about the chamber according as they lie, and that before you fall to the practise of this Art, you may perfectly (as your *Pater Noster*) remember every place, and what subject you have placed therein, which you shall the better perform, if you make a full and a lively description of every subject in your mind before you place the same. Now having gotten all these subjects, with their several places *memoriter & ad unguem*, suppose you are to remember a Cat, a Lute, and a Hand, you must alwayes remember to place your first word whatsoever it be, and how unapt soever it be, in the first subject, and so forward. And therefore you may imagine your Cat scratching the Souldier by the face, til the bloud run down his cheeks, he himself swearing
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and staring and struggling with her. Your Lute being laid in the fire, you may imagine the same burning to coles, and all the strings cracking in sunder to your great grief. Then you may imagine for the better remembrance of your third word, a hand raking in the dung-hill till it become foul and loathsome in sight; in the like manner you may passe through the whole decade. And if you have more words or *Capita rerum* to remember then ten, you must begin with the next decade of your local subjects, wherein you may place other ten words, and so you may proceed to what number you list, having subjects enough to receive them. Behold here that great and swelling art, for the which Master *Dickson* did usually take of every scholler twenty shillings, making one whole moneths discourse of the Theorique part thereof, but in the practise he could scarcely tell which way to bestow a full hour in demonstration. And yet to deliver my censure hereof, according as I have found therein, I must of necessity confesse, that although it doth neither answer his great promises, nor the expectation of his schollers, whose good opinions he did entertain so long with such golden hopes in the bettering of their weak memories, that yet notwithstanding the same is very sufficient to procure an assured and speedy remembrance of any 10, 20, 30, or 40. principal things more or lesse, that we shall take in charge to perform, and therefore very necessary for him that is charged with many errands, and would discharge them all in such order as they are delivered unto him, as also for the remembrance of all such pleasant tales and histories as shal passe in table talk, from conceited wits. In which two especial uses, I have often exercised this art for the better help
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of mine own memory, and the same as yet hath never failed me. Although I have heard some of Master Dickson his schollers, that have proved such cunning Cardplayers hereby, that they could tell the whole course of all the Cards, and what every gamester had in his hand. So ready we are to turn an honest and commendable invention into meer craft and coulenage.

99. *How to make projection, either upon Mercury, Venus, or any other of the base bodies, with a medicine so exalted, as that one shall extend upon a hundred, either 101 white, or 100 red, and abiding both the Touch, Malleation and Coppel, the gold being 24 Carots high, and the silver 12 ounces fine.*

Amultis amatur Alchimia & tamen virgo est.

I Could never yet perceive any sufficient warrāt or Allowance from the true and ancient chymical Philosophers of all former ages, for the manifesting of so great a secret as I have now in hand, in any plain or naked terms. And that made Geber to take hold of this Poſſe, *Secretum tuum non revelabis cuiquam.* And Comes Trevisanus, doth so religiously hold and maintain the secreting both of the Phylosophers matter, the fire, the colours, time and proportion that is to be used in this great work, as that he breaketh out into this strong conjuration of all such happy Alchemists as have already accomplished their golden desires in this Art. *Quod si materiam, pondus, aut colores naveris, adjuro te per Deum vivum ne cuiquam revelaveris.* But because I purpose not to prophane or violate those sacred grounds of nature in this discourse, but onely to particularize a few projections,

I hope that both my pardon and my fault shal carry one date, and therefore I wil proceed the boldlier in my purpose. It is a wonder to see, how every Art hath gotten his counterfeit in these days. How Logick is turned into Sophistry. Rhetorick into flattery, Astronomy into vain and presumptuous Astrology, that ancient and divine science of Alchimy into Cementations, Blanchers, and Citrinations, ending commonly either in cosenage, coinage, or in Capistro, which made *Petrark* to give a Caveat in these words. *Cave Alchimiam, semper rebus aliquid defuerit, dolis nihil.* And again, *Chimista qui tibi aurum suum spondet, cum tuo auro improvisus aufugiet.* This made *Chawcer* in his time to play so pleasantly upon the Alchemists hollow cole, and this hath made me to touch or glance at a few other flights of later date, thereby to admonish all young Gentlemen and others to take heed of all these mercenary hirelings, *Qui cum aliis mille aureos promittant, ipsi drachmam petunt. Locus poscit fabulam.* A subtle Merchant sorting himself of late, with an old smoky Alchemist for his better credit, as they became fellow travellers in the higher part of Germany together, lighting by chance upon a crew of Merchants that were wel monied, and ready for any rich prize that should be offered unto them, especially for *Jasons* bark that was laden with the golden Fleece, after some salutation had, and a few words of course interchangeably passing betwixt them, this cunning companion of the Alchemists began to parley with them in this manner. My Masters and friends, you seem to be men of honest parentage and condition, and most happily to be here met both for your own good and ours. So it is, that if you will perform that Secresie which is requisite in so
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weighty a matter as I am in purpose to commend unto you, I will make you the most royal Merchants of the whole world. Neither shall any of you make the hazard or adventure of one Denier, until with your own eyes and hands you shall have seen and made a sensible proof of this my friendly offer. It is but in vain to use many words among friends: You shall make a perfect projection your selves upon Mercury, *ad omne examen*; and because my self and my partner will be free from all suspicion of deceit, you shall bring the Crucible, the coals, and also the Quick-silver with you, and we will but onely deliver you one grain of the medicine, which shall extend it self upon a full ounce of Mercury, which you your selves shall likewise let fall into the crucible. A man would think that this were plain dealing, and that unless these men were wilfully bent to cozen themselves, that it were impossible to deceive so many young eys that watched so carefully for themselves. But now to the practise. The fire being kindled, one of them sets on the crucible by direction of the Alchymist, under the nose of a pair of Goldsmiths bellow, who told him, that for the better fixation of the Mercury, there must now and then a reverberatory blast be made with the bellows, after the Mercury was once warm in the melting pot. Now this Impostor had before conveyed into the nose of the bellows, an ounce or somewhat more (to supply that which the Mercury with his fume should carry away with him) of Sol, so subtiliated by often reiteration of *Aqua Regis* upon it, that it became almost an impalpable powder, which when the Merchant by the appointment of the Chymist had blown amongst the Mercury, he was willed to drop in the medicine,

being wrapt up in a smal paper, and then to leave the cruſible in the fire, until the medicine and the Mercury were both incorporated together, and that the Mercury were ſufficiently tinted into Sol, and within one halt hour (after he had firſt cauſed them to melt down an ounce of fine gold in another cruſible, and to put the ſame to the firſt work, for the better fuſion of the powder) he willed it to be taken out of the fire, and conveyed into an Ingor, and the ſame being cold, became two ounces of perfect Sol, abiding both the hammer, and the teſt, and the horn of Antimony. It is not to be doubted, but that theſe young gallants were right joyfull of this good ſucceſs, deſiring nothing more then to become Lullifts, offering to exchange their freedome both of the old Hance and of the new, for this multiplying Art.

Now this geer worketh like waxe, and the Alchymiſt demands 2000 Dollers, for the proviſion of coals, furnaces, ſalts, and minerals, but eſpecially to ingroſs all the Mercury that could be gotten, left either it ſhould riſe to an exceſſive price, or be transported into Spain for the refining of the Indian Ore. The mony is forthwith delivered by weight, becauſe there muſt be no time loſt in the telling, with a charg to uſe all expedition that could be for the gathering of the Mercury together, that was to be got far and near. The ſubſtance of this Hiſtory is delivered already, I will not ſtand long upon the circumſtance. The Alchymiſt having fingered the mony, begins to erect furnaces, and entertains them with a few diſtillations, calcinations, and ſublimations, teaching them how to make *Lutum Sapientie*, *aquam ſeperationis*, *aquam regis*, *oleum vitrioli*, *ſalis*, & *ſulphuris*, to congeal Mercury with the ſpirit of Saturn, to make ſac-

carum Saturni, to whiten their teeth withal, to blanch copper with Arsnick, to melt 1 part of Luna with 3 parts of Venus together, and then to forge plate thereof, & by a certain ebullition to make the same divers times to touch equal with our best sterling, or higher according to the fineness of the silver that was mingled with Venus; all this (with an infinite number of spagirical experiments) was performed, both to pass away the time without tediousness, whilest the Philosophers egg (which required 10 months digestion) was hatching in *Cælo Philosophorum*, as also to gain the more credit with the Merchants, whereby a man of these single gifts might not be feared or mistrusted of this flight, which both he and his companion were daily practising; & in the end, finding good opportunity, they put the same in execution, leaving that which had most need to blow at the coal. I do verily believe, that if the old D. of Florence were alive again, he would have outbidden the Merchants for this secret, whose distillatory vessels, furnaces, and other chymical instruments, were all of silver, as I have heard it often reported. But now to give a few Items more against these Impostors before I conclude, let every man that is besotted in this art, and depends wholly on other mens practises (himself not being sufficiently acquainted with those great and hidden Maximes of nature) take heed also of all false and double bottoms in crucibles, of all hollow wands or rods of iron, wherewith some of these varlets do use to stir the mettall and the medicine together; of all Amalgames or powders, wherin any gold or silver shall be craftily conveyed; of *Sol* or *Luna* first rubified, and then projection made on it, as if it were on *Venus* her self: but specially of a false back to the Chimney or furnace

nace, having a loose brick or stone closely joynted, that may be taken away in another room, by a false Sinon that attendeth on the Alchymists hem, or some other such like watch-word, who after the medicine and the Mercury put together in the Crucible, entertaineth *Balbinus* with a walk, and with the volubility of his tongue, until his confederate might have leisure to convey some gold or silver into the melting pot, which were able to deceive the best sighted *Argus* in the world.

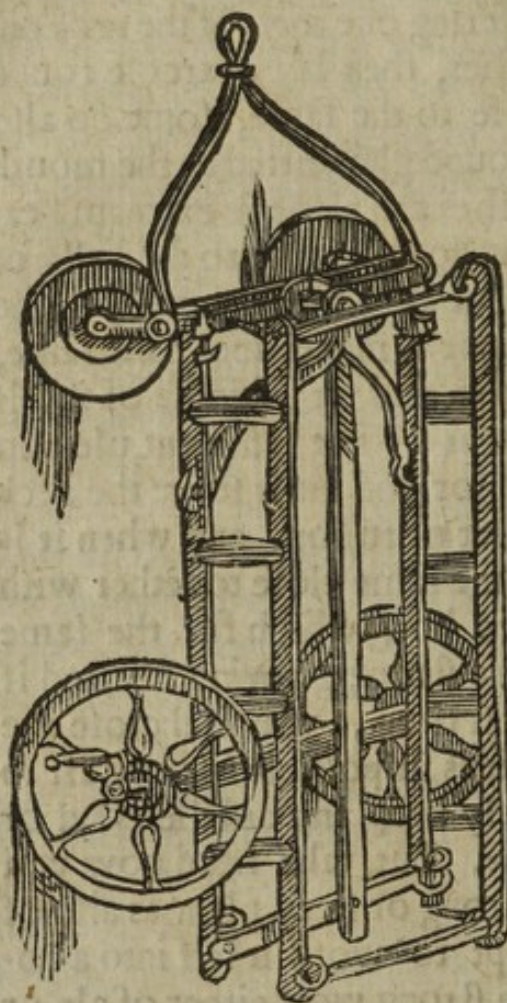
By these few legerdemains, I hope many thousands will be sufficiently warned of these wandring and roguing Alchymists, who since the death of Cuckow, Stanny, and Feats, and the rest of that rabble, are become the very Juglers of the land, yea infinitely worse then they; for that our ancient Juglers would shew all their Jugling tricks for a groat or a teaster; and though now and then they made shew to transmute silver into counters, or money out of one mans hand into anothers, yet in the end, every man returned with the Coin which he brought in his purse again: whereas these Rascals do not onely convert other mens money into their own purses, but procure also a great los and expence of time, which might have been many ways better, but no way worse imployed, and can never be redeemed again. Wherefore to conclude with Petrarch, *Dic ut ea sibi præstet quæ promittit aliis, primumque suam pellat inopiam. Est enim ferè mendicum genus hominum, cumq; se pauperis fateantur, ditare alios volunt, quasi aliena illis quam propria molestior sit paupertas: sic ut miseri se alios miserere dicere soleant impudenter, & ignotis etiam interdum magna promittere: O turpis promissio, & O stulta credulitas.*

100. *How to nip or close a glass with a pair of hot tongs, which is commonly called Sigillum Hermetis.*

PLace a viol or other glass having a long neck, in a pan of ashes, suffering one inch of the neck only to peer above the ashes, then lay charcole round about the neck, and close to the same, some do also cover the viol with a round glass fitted to the mouth both to keep out the ashes and also the extreame heat of the fire, from striking downward into the belly of the glass, covering also the very top or fumity of the glasse with charcole 2 or 3 inches above the same, then make a fire at the top, and let it kindle of it self downward, and if that heat be not sufficient, use also the blast of the bellows, for you must force the neck of the glass even to a heat of fusion, and when it is ready to melt, then nip the same close together with a pair of tongs being red hot, which for the same purpose must be kept in a strong glowing fire, and if you can take it in his just time, you shal close the same so strongly, that it is impossible for any air to issue out. You may safely keep any distilled Oyl or water in a glasse so nipt. But take heed how you keep the juyce of any strong or fiery plant, as also of any decoction that is apt to work it self into a body, as new must, or the strong wort either of ale or beer, lest you do not onely mispend your time, lose your liquor, and break your glass, but also happen to get a shrewd turn your self if you be within gunshot. For there be certain wild spirits within who can indure no imprisonment, but if they can find no way, they will make way, bearing out before them both lock, bolt, and hinges, and yet they are such as
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the Philosopher cannot want, though the vulgar sort know no use of them.

101. *A Wagon to be drawn with men, instead of horses.*



THe joints & other parts of this Wagon are so knit together with hooks and pins, as that it may easily be dis-jointed and taken in funder, whereby many of them may be couch-ed in a narrow room, & wil lie close together in a ship. It is to be drawn with six men, whereof two of the must labor at the forecariage thereof, and at either wheel other two, which must work by winding of the handles, (which are of purpose fastened both to the nave of the wheel and axletree) either forward or backward as occasion serves. The use thereof is to convey their victuals and other necessities from place to place, when the Mariners and souldiers have cause to land in some countries where the place affords no horse or other beasts fit for labour or carriage. I know not the author of this invention, but because it came so happily to my hands, and carries some good conceit

make it give up a lesson, which must be taken away

and that not become white as first in the same molds.

new college with 120 in all points, at 1000, till it be

bear, then boil the same a little, and presently put in the whites of eggs first beaten into oyl, which will make it give up a scum, which must be taken away as long as any riseth. Then pour all the liquors through a great woollen cloth bag & so the filth will remain behind in the bag; then boil the liquor again till it be ripe, which you shall know by taking two or three drops of the liquor, and putting that upon a plate of cold iron, letting it cool, which when it is congealed a little like salt, or as a mean between firrup and hard sugar, then take the liquor from the fire, and pour out the same into the earthen pot, or molds made for the same purpose, having a hole in the smaller end, which must be stopped for one night after, and after that night open it, letting all the substance remain in the pot, until the firrup begin to leave dropping (into the neather pot wherein molds stand) or drop very slowly at the little hole; this firrup (as I take it) is that which they call the Malassoes. Then take Potters clay, and clay the broad ends of the pot over therewith, and as that clay sinketh down by reason of the shrinking of the sugar, fill them up with more clay, repeating the doing thereof, till the sugar shrink no more; then take the sugar-loaves out of the Molds, and put them in a Stove till they be dry and hard, and after bind them up in papers according to Art. Note that if the sugar after the first boiling, and being poured out into the molds, and beginning to congeal, appear to be over-black or foul, and shal not become white at first in the same molds, but some special part remain therein, then it must be new boiled with Lee in all points, *ut supra*, till it be perfectly white. Also the clay must be potters clay, tempered like pap in water, and the same must run through

through a Colander full of holes upon the bottom of the Sugar loaf, for the softnesse of the sugar wil not suffer the pressing down of any stiff clay. This receipt though happily it want some of the circumstances in the Art of refining, yet it should seem the matter of substance is sufficiently unfolded herein. I had the same of a Gentleman of good worship, and a great artist.

104. *The discovering of Sal Gem in a Philosophical discourse as well upon the common as upon the vegetative and fructifying salt of Nature.*

HAVING found by sundry observations, drawn from experience her self, the undoubted mother of all true and certain knowledge, that all sorts and kinds of Marl, or soyl whatsoever, either known or used already for the manuring or bettering of all hungry and barren grounds, or as yet concealed, and kept in the bosome of nature, from the common and vulgar sort of people, to draw their fructifying vertue from that vegetative salt (which M. Bernhard Palissy in his learned and Philosophical treatise, *de la nature des eaux & fontaines*, doth so often term by the name of a fitt element, whereon all our ancient Phylosophers did scarcely dream) I have thought good, because I would not seem fantastical, & overweening in my own conceit, as if I were the first broacher of this opinion, before I proceed to any practical discoveries herein, first to set down that short and sweet discourse of *Franciscus Valetius* in his book of *de sacra Philosophia*. cap. 34. upon the miracle contained in the fourth book of the Kings, and second chapter, and then to amplify the same by

some of those manifest experiments which are common in this land already, and by some others of more value, and yet of lesse charge, although as yet not known, or at the least not published by any former Author.

In the Fourth Book of Kings, the Second Chapter, the 19, 20, 21, and 22 Verles, it is thus written: *And the men of the City (that is of Jerico) said unto Elisha, Behold sir, the dwelling of this City is pleasant, as thou thyself seest, but the water is naught, and the Ground barren. He said, bring me a new Cruse, and put salt therein. And they brought it to him. And he went unto the Spring of Waters, and cast the Salt therein, and said, Thus saith the Lord, I have healed these Waters: there shall not come henceforth either Death or barrenness. So the waters were healed unto this day, according to the saying of Elisha, which he spake.*

Whereupon *Valerius* treateth in this manner. There is no doubt but that this, as also divers other signs and tokens were shewed unto the people of Israel by way of figure, as *St. Paul* doth testifie, and that the same doth signifie some other purifying, and cleansing of waters, and that it was done in token of some Sacrament. But whether there be any regard to be had of Nature in this miracle, or no, we are at this present to consider and examine. For I have oftentimes observed, even in the performing of miracles, that for the most part, it pleaseth God to use some natural cause, and that upon many and excellent reasons him moving thereunto. Wherefore seeing the barrenness of the earth is cured by the Waters, it is manifest that there is nothing else meant in this place, but that the Waters were of such kind and quality,

quality, as that the earth being watered therewith, became barren by their corruption. And it seemeth by all probability that this fault was in their saltness, both because it is an ordinary accident to many waters, whereby they are made unwholsom to be drank, and because that of all other things doth most of all make the earth unfruitfull; whereupon it grew into a custome with our ancient forefathers, that all such ground as became forfeit and confiscate unto the Crown, by reason of an high and capital offence committed, shall be ploughed and sowed with salt, which we read to have been done by *Abimelech*, in *Judg. 9.* when he had destroyed the City of the *Shechemites*: And the Psalmist saith, He hath destroyed a fruitfull land with saltness, for the wickedness of the inhabitants. And therefore saltness is a principal means to make the ground unfruitful, and the sowing of salt thereon bringeth forth barrenness and a curse upon it.

But how then commeth it to pass, that if the waters of *Iericho* did hereby both become unsavory for the people to drink, and unprofitable for the increase of the earth, that there should be any naturall vertue in salt, to help and sweeten them, especially when *St. James* says in the 3d chapter of his Epistle, *My Brethren, can the figg tree bring forth grapes, or the vine bring forth figs?* So neither by the same reason can salt make waters to be fresh and sweet. Neither can it be denied, but that as contraries are remedied by their contraries, so likewise that the faults of all things are increased by their like, and semblable Natures. Therefore one of these two must of necessity tal our, that either in the miracle of *Elisba*, there was no regard had of nature at all, but that there was a meer

contrary course to nature used, thereby to make the miracle the greater (for we read of the like often in the holy Scriptures) or else that the fault of these waters, was not in their saltnesse, but rather in some other rotten and putrified corruption, which as in all other things, so in water most especially is corrected by the addition and mixture of salt. For salt being of a hot and dry nature, and by solution being very apt to incorporate therewith, consumeth all the putrified vapours or parts thereof, and correcteth all the putrifaction which it finds, and it maketh al good waters to keep sweet and sound the longer. For the Mariners themselves can witnesse, that such waters as be somewhat brackish, are the best for long voyages, because they will last longer then others : and therefore they do often water their ships from springs that be near the sea. And furthermore they that do search more narrowly into the nature and property of all things, do constantly affirm, that such springs as be offensive in smell, or that carry any bad or corrupt tast with them, are no way better to be purified and cleansed, then by casting of salt into them. Therefore this seemeth very probable, for that (besides all which I have already alledged) waters do become most deadly and contagious, by their putrified and offensive smells, rather then by their saltness. Yea the saltnesse of the water unlesse it be extream (as in the sea of Sodom, which for that it ingendreth no live thing, and also destroyeth whatsoever falleth into it, it is called by the name of the dead sea) doth neither tend to destruction, neither is it offensive to the fertility of the ground, but rather being melany brackish, and thereby it self also not subject to putrifaction, as we may behold in the sea, it maketh the waters themselves

themselves most fruitfull. Neither is there any place in the whole world, where that generative vertue doth more abound, or where there is more infinite generation and multiplication of creatures, then in the wide Ocean. And I do verily beleeeve, that the spirit of God, which in the beginning did spread it self upon the waters (which I hold to be a cerrain fire) did make them to be of that nature, that is to say, thick and salt, and by that reason they are much more apt for the generation of all creatures, then any fresh waters whatsoever. Now then every kind of salt water is not hurtfull to plants, neither is it hurtfull to all alike; but there be certain plants which prosper best in salt waters: and those springs which be somewhat brackish, are rather unfit to make drink for mans body, then to water the grounds. For nothing is more unflavoury in our drink then salt, because that our thirst doth naturally desire to be satisfied with that which is cold and moist, whereas these watering dews do rather represent a food, then a bare drink to the earth, for they give a kind of nourishment unto plants; neither do they offend, unless they be oversalted like Brine. So that according to the measure of saltnesse, these waters be either good or hurtfull to all kind of vegetables; for if they favour of the excess, then they burn and dry up the ground, and so make it barren: but if they be moderately salt, they agree wel with divers plants, and be not very hurtful unto any.

So likewise all other living creatures by the extremity of saltnesse are destroyed utterly, as we see by the Red sea, for they are even parched away therewith; but if that the same be more temperate (as in all other seas) many creatures are engendred thereby,

by, and do grow into huge and mighty bodies, and be more sound then any other creatures, and many of them being dead, may be kept a long time; although I am not ignorant, that some kinds of fishes cannot endure the least saltness that may be, neither can they continue or live but in the fresh water onely, and some others again do thrive and prosper in either of them; such is the great variety of natures. But unto man, and to divers other land creatures, the eating of much salt is very contagious, because it maketh the blood salt, and it breeds barrenness to mans body by the extreame siccity thereof, and it maketh our seed or nature too sharp; but the same being moderately taken, is very stirring in our bodies, and provokes them to venerous acts, whereby it helps to the generation of mankind.

And therefore me thinks, that all those controversies about the several natures of salt, are but frivolous, wherein some do contend that it engenders barrenness and death, and therefore it was used to be thrown upon cursed grounds; and others would have the same to be of a fruitfull and incorrupt nature, which made the Poets to feign, that Venus was born in the sea, by means of the sperm of the Gods that fell into it, and so they called her *ἀπρόδιτην* of the foam or froth of the sea. And here by the way I will make bold also to insert the opinion of that learned and great Magician, Jo. Bapt. 347. who writing upon the helps of conception, saith, that salt doth greatly further procreation, for it doth not onely stir up lust, but it doth also minister fruitfulness. And therefore the Egyptians did use to feed their Bitches with salt meats, when they found them unapt for generation. And Plutarch doth witnesse, that ships upon the seas are

and pestred and poisoned oftentimes, with exceeding store of mice. And some hold opinion that the females, without any copulation with the males, do conceive onely by licking of salt. And this maketh the Fish-mongers wives so wanton and so beautiful. Which caused the Egyptian Priests by the report of *Plutarch* most religiously to abstain from salt, and salt meats, for that they found them very stirring and provoking to venery. Wherefore since the nature of salt is to defend and take away all putrification, which leadeth every thing unto destruction, it seems upon good reason that this was the salt of the waters of Jericho, and that *Elisha* did hold a natural course in correcting of them: God himself exalting above nature that natural property which he had first given unto salt: for otherwise, neither so small a proportion of salt, would have sufficed to have purified so great a quantity of waters, neither could these waters have lasted sweet untill this day. Thus far *Valerius*.

Now that we may yet have a further, and more inward speculation into the nature of salt, it shall not be impertinent to our purpose, to set down & gather all those observations, which I have also culled and gathered out of two larger treatises, the same being even wrung out of the bowels of the earth, by that learned husbandman Master *Bernard Palissy*, whereof the one is intituled, *Des sels diverses*, and the other *De la marn*, whereby all those that be true infants of Art, may receive a full light into Nature, which doth here present her self in all her royalty, with her *Cornucopia* in her hand, and the ignorant Farmers may also glean with them, a few loose and scattered ears, to make so much bread of, as may
O relieve

relieve their hungry bellies. And having performed this collection, I will set down such particular practises as have their full warrant from these two Theoricks, and may serve in divers parts of this land, either for arable or pasture grounds, where the ordinary soil or dung doth fail us.

A Philosophi-
cal discourse
upon salt.

There are so many sorts and kinds of salt (saith Master Bernard) that it is impossible for any man to number them all; and further I tell thee, that there is not any one thing in the world, which doth not participate of this salt, whether it be man, beast, tree, plant, or any other kind of vegetable, yea, even the mettals themselves; and that which is more, there is not any kind of vegetable whatsoever, that could grow or flourish, without the action of salt, which lies hid in every seed; and besides all this, if the salt were divided from the body of any living man, or from stones which are wrought up into strong buildings, or from the principal posts, the beams, and rafters of any house, they would all fall to powder in the twinkling of an eye. The like may be said both of Iron, Steel, Gold, and Silver, and all other mettals. And therefore he that would know of me how many kinds of salt there be, I shall be forced to answer him, That there be as many as there be several sorts of tastes, or scents.

Diversity of
Salts.

Coppres is a salt, Niter is a salt, Vitriol is a salt, Allom is a salt, Borras is a salt, Sugar is a salt, Sublimate is a salt, Saltpeter is a salt, the Salt gem, Le Salicor, the Tartar, Sal Armoniack, all these are divers kinds of salts; and if I would take upon me to name them all, I should never make an end. The salt which the Alchymists call Sal Alkali, is extracted from an herb which groweth in the salt marshes of the Isles of Xantoign.

Xantoign. The salt of Tartar, is nothing else, then that salt of the raisins which giveth the taste and savour to the Wine, and defendeth it from putrefaction: and therefore I say yet again, that the savour of all things proceedeth from salt, which alone causeth the vegetation, perfection, maturity, and the whole good that is contained in every thing that nourisheth.

And although there be divers sorts of these and other vegetables, whose salts be more fixed, and of harder solution then the salt of the Vine, & *du salicor*, nevertheless I say, that in all manner of Trees and plants there is more or less of this salt, *videlicet*, so much as is sufficient for them, as well as in those others before mentioned; for otherwise many kinds of Ashes would not serve to whiten linnen cloths: by the effect of which ashes thou maiest easily understand that there is salt in all things. And thou art not to think that the ashes be of strength to whiten, but only by the vertue of their salt, for otherwise the self-same ashes might serve divers times.

But insomuch as the salt which is within the said ashes commeth to be dissolved in the water wherein they boil, it penetrateth the linnen, and by his vertue, sharpness and biting; all the filth and soil of Cloth is dispersed, mollified, and carried downward with the water, which afterwards becommeth a Lee, because that therein resteth and remaineth all such salt as was in the ashes before, being now dissolved by the action of the water, and the ashes by this means having lost their saltiness, have not any more strength to whiten any other linnen, and men cast them out into the streets as altogether unprofitable. Mark yet one other example. When the Salt-Peter men seek to draw out Salt-Peter from the earth, they work

The properties of salts

Salt the strength of ashes.

in the same manner as is before set down for the making of the Lee, and when they have gotten out the salt-peter, both the ashes and the earth, out of which they have now taken the salt, are altogether unprofitable, for that there is no more salt left, which was the principal worker.

And yet for thy better instruction, consider those men which tan the hides of beasts, they take the barks of Oak, and having dried and broken them, they lay them amongst the hides in their tanning Fats; and when the hides have remained their full time with those barks, they cast them away as a thing of no further use (although I know that in divers places where fuel is dear, they use to make clods or turfs of them, in the likeness and form of cheeses, which they cause to be dried, and so burn them for want of other firing) but the ashes of them are nothing worth, because the salt of them is already spent.

Doest thou not understand hereby, that it is not the bark that hath hardened and tanned the leather, but the salt which is contained therein? For otherwise the same barks would serve again; but because the salt is dissolved, it is soaked into the leather, by reason of his moisture, which hath made an attraction thereof to serve his own turn. It is also to be noted, that in all kind of woods the salt is in a manner wholly in the barks, and that such wood as is barked doth never yeeld any strong ashes.

Mounſieur Siſly, Duke Mountpenſier his Phyſitian, ſhewed me upon a certain time, a ſtick of Cinamon, which was about four foot in length, and an inch thick; I taſted of the uttermoſt bark thereof, and it had the lively and natural ſavour of the beſt and ſtrongeſt Cinamon, whereas in all the reſt of the
ſtick

stick there was no more tast then in a stone, And this is the reason why the Tanners account of nothing els but the barks, because of the salt which is in them; for otherwise the rest of the wood being wrought into powder, might serve their turn as well.

And for further proof that there is some salt in every thing, we read that the Ægyptians were wont to use Niter, and other aromatical bodies, about the dead bodies of their Kings and Princes, which we do call embalming; which Niter is a preserving salt that defendeth from putrefaction; and their flesh so embalmed, is called *Mumia*, which the Ægyptians do find to be very medicinable, and for my part I think the same more wholefome then potable gold. There be some in our time that would fain imitate that ancient manner of embalming, and seek to make a kind of *Mumia* of their bodies who have suffered death for some capital offence; but they fail herein, and their *Mumia* doth soon corrupt and putrifie, for want of such excellent aromatical drugs as those ancient Ægyptians used. For now it is generally holden, that all those sweet smelling simples, all the Rubarb, Gums, and other aromatical ware, are greatly sophisticated before they come to our hands, and our common salt is not of that vertue to preserve things withal, as those aromatical drugs which come from the blessed Arabia, and other hot countreys. And that every thing hath some salt in it, it is manifest, for that it is possible to make Glasse of all kinds of ashes, although some sorts of them be of harder fusion or melting then others. And were there not some salt in all trees and herbs, it would be most impossible to make glasse of them.

Glass of all
kinds of ashes

The secret virtues also which lie hid in salt confirm

The virtue of
Salts.

firm the same. For salt whiteneth all things, it hardneth all things, it preserveth all things, it giveth savor to all things, it is that Mastick that glews all things together, it gathereth and knitterh all mineral matters, and of many thousand pieces it makes one mass. This salt gives sound to all things, and without the sound no mettal will ring in his shrill voice. Salt maketh men merry, it whiteneth the flesh, and it giveth beauty to all reasonable creatures; it entertains that love & amity which is betwixt the male and female through that great vigour and stirring up which it provoketh in the engendring members; it helps to procreation, it gives unto creatures their voice, as also unto mettrals. Salt is the cause that many smal piblestones being subtrilly powdered, become one mass, whereof they make our drinking glasses, and all other sorts of Table-vessels; and by the power of salt, all substances may be brought into transparent bodies. And it is salt that makes all seeds to flourish and grow: and although the number of those men is very small, which can give any true reason why dung should do any good in arable grounds, but are led thereto more by custome then any Philosophical reason, nevertheless it is apparent, that no dung which is laid upon barren grounds, could any way enrich the same, if it were not for the salt which the straw and hay left behind them by their putrifaction. And therefore all these simple sorts which leave their muck-heaps abroad, and subject to the weather, shew themselves to be but mean husbandmen, and that they never tasted of any true natural Philosophy. For the rain which falls upon these dung-hills, flowing downward into the valleys, doth also carry with it the salt of the dung, which dissolveth it self with the moisture:

Muck-heaps
ought to be
covered.

ure: whereby the soyl being afterward laid abroad upon the land, doth little or no good unto it. But if thou wilt not give credit unto my speech, yet mark how the labouring Hind, when he carries his dung to the field, how in discharging of his loads he leaves it in certain heaps together, and a while after, he com-meth to spread it all over the ground, and layeth the same in equal level; and afterward when the field happens to be sowed with corn, thou shalt alwayes find the corn to be more green and rank in those places where the same heaps were first laid (after they have lain there some reasonable time) then in any other place in all the ground besides; and this comes to passe, by reason that the rain which fell upon them hath carried even the salt through them, and conveyed it into the earth that was under them. Whereby thou mayest easily gather, that it is not the dung it self which causes fruitfulness; but the salt which the seed hath sucked out of the ground.

And hereupon it com-meth to passe, that all excrements as well of man as beast, serve to fatten and enrich the earth. But if any man will plow and sow his ground yearly without dunging the same, the hungry seed in time will drink up all the salt of the earth, whereby the earth being robbed of her salt, can bring forth no more fruit, until it be dunged again, or suted to lie fallow a certain time, to the end that it may gather a new saltness from the clouds, and rain that falleth upon it. But I speak not here of common salt, but of the vegetative salt; for there be some that hold opinion, that there is no greater enemy to all feeds then salt, and that because in ancient time, when any wicked or desperate villain had committed any notorious crime that deserved death, he had sentence given

given him to have his house rased, his ground turned up, and sowed with salt, that it might never after bring forth fruit again. I know not whether there be any Country whose salt doth not agree with corn: but I am sure that upon the little hillocks in the salt Marshes of Xantoign, men do mow as good grasse as in any other place that ever I came in. And those hillocks do come up of the grounds and washings thrown up from the bottome of the same Marshes, which are as brackish as the sea water, and yet nevertheless I did never see any fairer corn in my life then groweth in them. And therefore I know not why our Judges have taken occasion to sow salt on the offenders grounds, to bring a curse upon them, unlesse there happen to be some such Country where salt is the meer enemy of all seeds. But to continue our first course, and to prove that salt is no enemy, either to the vegetative or sensative nature. We see that the Vines of the Country of Xantoign which are planted in the midst of the salt marshes, do bring forth a kind of black raisin, which they call *Chanckets*, & whereof there is a wine made that is nothing inferior to our Hypocras, in which they use also to dip their roasted bread, as they do in Hypocras. And these vines are so fertile, that one plant of them doth bring forth more fruit, then six of those that grow in Paris. See now what reason I have to think that salt is so far off from being an enemy to nature, that on the other side it doth rather help the goodnesse, sweetnesse, maturity, generation, and preservation of the said Vines. And not onely salt doth give his aid, and help herein, but also the air it self by his exhalations. In the aforesaid Islands, and within the salt Marshes, there is a salt Hearb found called
Salicor,

Salicor, whereof the most beautifull glasse of all other is made; and there is also gathered that Xantoign Wormwood, so called of the Country where it groweth. The same hearb hath this property, that if one do boil the same, and with the decoction thereof temper a little meal, and make it into paste, and to fry the same either in lard or butter, and eat thereof, it will expell, and drive out all such worms, as are either within the bodies of men, or children. And before I understood thereof, I had six children that died of the worms, which I did manifestly perceive, as well in the anatomizing of their bodies, as also for that oftentimes they voided them at their mouths, and when they were drawing to their end, these worms would issue at their nosethrils. My purpose is not hereby to prove that common salt doth agree with all kind of plants, but I am well assured that the salt Marshes of Xantoign, do bring forth all manner of fruits that are planted there, and the same so pleasant, as in no place more where I have travelled: All wild hearbs, thorns, and thistles, do prosper so exceedingly there, as no where better, which is a sufficient confutation to those which would have salt to be enemy to all plants. For if it were an enemy to plants: it should also be an enemy to the nature of man, which the Burgonians, wil by no means confesse, for if they were so perswaded, they would never have ordained that salt should be put in the mouths of their infants at their baptism, whereupon they are termed the powdred Burgonians. Neither will the beasts agree that salt is an enemy unto them, for the Goats will devour as much thereof as you will give them, and they seek out purposely for brinish wals, against the which men have made water, even to

P

lick

lick them. And the Pigeons when they happen to find an old wall whose temper was made of Lime and Sand, and begins once to molder away, they will never leave it, nor be driven from it.

Now some simple Clown that never knew what learning meant, will perhaps imagine that they feed upon the sand, but that is but a blind conceit, for it is not digestible, whereas this is the very potable gold of the Pigeons, and therefore we are not to think that they seek for ought else then the lime that is in the mortar, and that for the saltneffe thereof. And if they happen to swallow one grain of sand, it is against their wils.

The Oysters for the most part are also nourished by salt, and their shels are compounded of it, which they themselves have wrought up, and it is very apparant that it is so, for that their shels being cast into the fire, do make a crackling much like to a common salt. And if salt be of that virtue as to work an erection of those ingendring parts (as I have said before) it is a thing most certain and well approved, that Oysters themselves are of the same operation: which approves my former allegation, that those Oysters are for the most part nourished with salt.

But for a further confirmation, that salt is no enemy to any vegetative nature, let us a little behold the work of the plain Countrymen of Ardenna, in divers places whereof they cut down woods in great quantity, and those they couch and range in the earth in such sort, as that there may be drawn unto them some air from below, then they lay great numbers of clods of clay upon the same wood, yet such as are full of swarth, and grasse, and afterward they kindle the wood which lies thus covered with the turf, and after

after they have burned them altogether sufficiently, they do disperse them over the face of the whole ground, as we use to do in our dung; then they plow it, and sow Rie there where nothing else but Wood grew before, and the Rie commeth up abundantly: and this they do every sixteen years; and in some parts but six years, and in some parts but four years only, wherby the ground being spared so long, bringeth forth afresh as much wood, and as great as at the first. And of this Wood they fell so much as is sufficient to enrich the ground for one years crop, and burn the same with their turfs together as before; and so consequently every year until the number of sixteen years be expired, and then they begin again at the first piece of ground which they had plowed sixteen years before, in the which they find the wood of as great a growth as in the beginning. Hereby it is manifest, that the rustical opinion of those clownish people of that Countrey is utterly false, who think, that the heat of these fires, and the ashes, are the only cause which maketh their cold countreys fruitful, whereas indeed it is the salt of these trees, herbs, and roots being burnt, which they have left behind them. And therefore if my wits were able to search into all the vertues and properties of salt, I would think to do wonders thereby. For even the Alchymists give a blancher to Venus with the salt of Tartar, or some other kind of salt. And salt is a most necessary thing for the Diers, for that Allom which is a salt, draws unto it the colours of Brasil, and of Galls, and of other matters, and so makes both Cloth, Silk, and Leather to take their Die the better, insomuch as the Diers, when they would die a white cloth into red, are sometimes forced to dip it first in allom water. Yea,

and some kinds of salt do so harden iron, and do give such a temper to the edges of weapons, as that one may cut Iron with them, as if it were but a piece of wood. What should I say any more of this salt, for it passeth my reach to make any true description of the excellent vertues thereof? Onely I wil conclude with this, that if it were possible to keep the same from moisture, then divers subjects wherein it is included would last for ever; and so the salt that is in wood would defend the same from all putrefaction, and if all humidity might be defended from entring into a piece of wood, there would never any worms breed or engender in the same: for it is impossible that any putrefaction should begin, unless some moisture be first kindled by way of putrefaction. Thus much out of the first Treatise.

Now I will take out a few of the most principal notes out of his large discourse on the title of Marl; and so proceed from these French Theoricks to some English practises.

A practical
discourse upon
Marle.

Marl (saith Master *Bernard*) is commonly a white earth which men dig out from under the ground, and for the most part they are forced to make pits in such sort as they do for wels before they can come at it, and where they find any store thereof, they lay the same upon their hungry and barren grounds, first in small heaps, and afterwards they disperse the same upon the whole field, as is accustomed in the common manner of dunging. And this Marl will keep the ground whereon it is laid, some 10 or 12 years in heart, and in some countreys for 30 years. And sometimes the vein thereof begins at the very entrance of the pit, and so runs down many yards deep; and sometime we are forced to dig eight or ten yards before

before that we can come unto the Vein thereof.

But one thing amongst the rest seems most strange of all other (which I have heard some men maintain) that it profits the ground very little the first year that it is laid abroad, and that by reason of his exceeding heat, whereby it burns up the seed that is then sown. But this is easily answered, for that in the grounds bordering upon the woods of Arden, which are very cold, they use Lime instead of Dung, and thereby they make the earth most fruitfull that was barren before. Now if Lime (which is nothing else but a baked or burnt stone within those fiery furnaces, and whose moisture is altogether exhaled, so as there remains therein nothing else but the terrestrial parts replenished with a fiery vertue) be found so rich a soil, I know not why the heat of Marl may not much better be endured. But it is very requisite to spread the same upon the earth before the winter begin, to the end that the frosty weather may the better dissolve the same.

There is some Marl that is as white as Lime, and other some that is of a gray or russet colour, some of it is black, and some is yellow. The cause of the white Marl proceeds of his long decoction: That which is black may have many causes, the principal whereof is, that there is not any long time past since the matter thereof began to congeal; and this Marl is more easie of solution; and peradventure some putrified wood, or some minerals have turned the matter into a black colour. And as for the yellow Marl, that colour may happen either of some Iron mine, or of some mine of Lead, Silver, or Antimony; and thus you see the reason of the diversity of colours that happen to Marl.

That Marle is
not hot.

Marl is no other thing then a kind of clay ground, and therefore seeing clay is cold and dry, as it appeareth by the Mercasites, and by wood that is both metalized and petrified in clay grounds, it is manifest, that Marl is also cold and dry, and therefore it is not the heat thereof, which bettereth or amendeth barren grounds.

The beginning of Marl
with the trans-
mutation
thereof;

All Marl was earth before it became Marl, it is a kind of clay ground, and chalk it self was Marl before it became chalk: And that which is more, that which is yet chalk within the Matrix of the earth, wil in time harden into a white stone. And last of all, wheresoever there be any stones that be subject to calcination, they were first Marl before they were stones, for otherwise by their calcination they could not possibly amend any barren grounds.

Marle to be
dissolved by
frosts,

Directors colors
of Marl

When Marl hath once begun to pass his decoction, it becommeth so hard, that the rain cannot dissolve it so soon as we would have it, but it remaineth in smal pieces upon the ground undissolved, and hereby it comes to pass, that it can impart none of his strength unto the ground, until it be melted and liquified, and for that this cannot be suddenly performed as in the first year, therefore the frosts in some reasonable time after do cause a dissolution thereof, and then it helpeth toward the generation and germination of all seeds, that shall be presented unto it. Also chalk and lime, after the frosts have taken them, whereby they crumble into powder, do become good Marl, and serve instead thereof.

How Marle
works his ef-
fects.

Although I would not have the generative vertue of Marl attributed to his heat, yet my meaning is not thereby to rob Marl of his heat; but I labour to confute the foolish opinion of those, which attribute the whole

whole virtue thereof to his heat, I say the whole both inward and outward. For it is well known that salt is inwardly hot, and therefore it is accounted an help to the act of generation, and alwayes in extreame cold weather, a man shall find salt to be as cold as water, or any stone. Whereupon we may easily gather that his heat could actuate nothing, unlessse it were first stirred up by a counter heat wherein consisteth the seminal act; and therefore we must reason more deeply, and look to the essential cause that moves and works herein, and then we shall find out some hidden matter that is not subject to every mean conceit.

And this is a fifth element (never known before to the ancient Philosophers) which is a generative water, clear, subtile, mingled inseparably with other waters, which water being also brought among common waters, doth indurate and congeal it self with such things as do happen to be mixed with it. And although the common Waters do mount aloft again by the attraction of the Sun, whether that the same be in Clouds, Exhalations, or vapours, yet nevertheless the second water, which I call a fifth element, is also carried amidst the others, and when those common waters run downwards, along the valleys, whether they be floods, rivers, or springs, I say that in what sort soever they descend, or in what place soever they stay, they do always frame some one thing or other, and most commonly either great stones, rocks, and quarries of stone, according to the grossness of the matter which is stayed with it, and carries the form of his mold wherein it rests, and this being so congealed, that common water is sometimes drunk up in the earth, and descends lower, or else

A fifth Element, and what it is.

else it is drawn upwards, and doth vanish away in vapours and clouds, leaving his companion behind, which he is not able to carry any longer. And thus is Marl ingendred, for before it was Marl it was a certain earth, into which both these waters had entred, and had reposed themselves for a certain time: during which rest, the generative vertue became congealed, and the vaporative water passed away, and was drawn up from the other, and so the earth (wherein this congealed water did stay) waxed hard, and became white by the vertue thereof, being both wrought up into one body, whereby it comes to pass that when this marl is scattered abroad, upon the arable ground, the seed which is sown thereon doth not take of the substance of this marl, to help his vegetation, but doth rather glut it self with this generative, and congelative water, which I call the fifth element, which generative water being once consumed by often sowing of the ground, the Marl becommeth unprofitable, as a sign of some decoction finished: the like is to be thought of all other dung and lime.

The use of the
exhalative
water.

It is also to be noted, that the seed which is sown cannot make any attraction of this generative water, if the same were not also moistened with the common water. And that when the ground is moistened either with the rain, or dew that falls, the common water that descendeth together with the generative, staies the hasty congelation of the other, whereby it comes to pass, that corn and other seeds do keep themselves green untill their maturity, and when they are ripe, and that their root ceases to draw or drink up any more thereof, the exhalative water flieth away, and the generative remains; and as
the

the decoction in plants begins to perfect it self, so the colour also changes, as it comes to pass also in stones and all kinds of metall. So as this fifth element, although it be a water, and mingled with other waters, yet it is the same which doth uphold both straw and hay, and all kinds of Trees and Plants, yea, even men and beasts likewise; and of this generative substance, the very bones both of man and beast are hardened and framed in their kind. And even as we see the pibble or flint stones which are formed and engendred of this congelative water, do endure the strength of fire, and are not consumed therewith, but rather vitrified; so in like manner this fifth and generative element being within the straw and hay, cannot be wasted away; for if thou doest burn them, or any other wood in the fire, all the common water thereof will vanish into smoak, but this generative water, which hath sustained, nourisht and encreased both the straw and hay, remaineth in their ashes, and cannot be consumed, but turneth it self into glasse, being liquified in those hot flaming furnaces, and the same so clear and transparent as the generative water it self was before this congelation. But there is nothing that more resists fire then the bones of divers beasts, as I have often proved, when I have burned the bones of sheeps feet, and so of eg-shells, which is a manifest argument, that they have drawn more abundantly to themselves of this generative water then any other parts. And there is no doubt but there is great store thereof in the apple of the eye, which being continually moistened and accompanied with the other exhalative wate, is kept from being hardned into the nature of a stone. Neither is there any kind of stone which in his principal form is not clear and white,

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and

and those which are cloudy are so by accident, for that in their composition there hapned some earth or sand to be congealed or hardned with their first matter. Nevertheless there is no stone so dark and obscure, which by force of fire doth not become transparent at the last, because that principal element, wherof I have spoken so much, makes all things else become transparent and fixed, as it is it self in his first being. This I have written the rather to encourage thee to seek out Marl within thy own inheritance, to enrich thy barren grounds, that they may yeeld their fruit abundantly in their seasons. And in so doing, thou shalt shew thy self a good Husbandman, and become a pattern unto all thy slothfull neighbours, whereby they shall be forced to imitate thy good example.

How Marle
was first found
out

Now concerning the finding out of this Marl, I think that those which first hapned upon it, did not obtain this skill by any true Theorical imagination, but that by meer chance they did find the same without any seeking; as peradventure by the digging of some Ditch or other Trench about their ground, and being forced to throw up that which they had digged upon the banks of their arable fields adjoyning, and finding such corn as hapned to be sown upon these banks to be more fresh and rank then in any other part of the field besides, they prosecuted this good hap of theirs further the next year, and so did spread the same over the whole field, and so by long experience, and in the end they found the same much more profitable then any other dung. Some others peradventure might happen on the same in seeking for springs, in like manner. Yet it is always to be noted, that this Marl must first be dissolved throughout
the

the ground before the seed can make any attraction thereof unto it self, even as flesh cannot purchase a defensative against putrifaction by salt, until the salt be melted and made liquid.

But for the more easie finding out of this Marl, I think it necessary that every man should have a long Auger or Piercer, with several large bits which he may put on and take off at pleasure, and with these he may search at what depth he will in divers places of his land, always marking what several veins of earth he finds in the bit of the Auger, and of every several earth wh ch he draws up, he may make some trial upon the ground, unless he can be assured by the whitenesse and hardnesse thereof, that he hath hit upon the right Marl, for then he needeth not to proceed to any further tryal.

How men may
search for
Marle

And having once found the vein, he may lay it open in such sort as may be most convenient for the evacuating thereof. Now if there happen to be any quarry of soft stone between him and the Marl, he must first make his entrance through the stone with a piercing worm, and then having made way, he may seek further with his foresaid Auger.

Marl for the most part is white, yet in divers parts of France there is both gray, black, and yellow, and therefore we must not wholly rest upon the colours thereof; for these other colours may become white by a longer decoction. And as there is a white Marl, so likewise there is a white clay, which I think will serve instead of Marl, especially that fulling earth wherewith the Fullers use to scour out oyl out of their cloaths.

Colours of
Marle

A white Clay.

Fullers earth

It is an erroneous opinion to think that Marle may be discerned by the feeling of the hand, as some

That Marl is
not of a fatty
nature.

doe hold, and that it is to bee knowne from other moulds by the fattiness or viscoufness thereof, which is false; for if it were fatty, it would be impossible either for rain or frost to dissolve the same; for all oyly things do resist and strive against water; yea, we see apparently, that both Clay and Marl do help to scour out all greasie and oyly spots, as Fullers can well testifie; and if Marl were of an oyly nature, it would consume in the fire, but if we make any proof thereof, we shall find the same most violently to resist the fire.

And in the latter end of this Philosophical abstract Mr. *Bernard* concludes thus, That Marl is a natural, and yet a divine soyl, being an enemy to all weeds that spring up of themselves, and gives a generative vertue to all seeds that are sown upon the ground by the labour of man. And here ends, Mr. *Bernard*.

A man would think that so learned a Theorick as this, in a matter so general, and necessary for the land of England, so plausible to worldly wits, and set down in so plain and familiar terms, could never have been extant so many years together, with so little fruit & profit to all our lean and barren grounds, as (for ought that I can see or hear) it hath been hitherto; and so is like to continue, unlesse some studious Scholler, or other, will step forth, and take our idle Farmers by the hand, and either lead them over shoos into one of Master *Bernards* muck-heaps, or else by violence thrust them into one of his Marl-pits. For what easier course can be directed by the pen of any Writer, then is here delivered for the finding out of Marl? or what cheaper tools could the wit of man devise, then an hand, and a piercing Auger, to search into the bowels of the earth for her marrow,

marrow and fatnesse? Do we think that Nature is bound to cast up the treasures of her full gorge amongst us, who will not vouchsafe one pipe of Tobacco upon her? *Effodiuntur opes* (saith *Ovid* unto all slothfull Husbandmen :) and therefore seeing we may have such wealth for the digging, let us not spare the shovel and mattock, till we have found out some Marl-pits in our own demesnes.

For the veins of Marl are more in number, much longer and broader, and deeper then we think for; and although we find them not in one place, yet we shall happily find them in another. It is a small adventure to hazard a shilling to gain a pound: It is no losse to set poor men on work, (which otherwise in conscience, we being able and they being honest, we are bound to relieve) though they gain us nothing, our great possibility may easily countervail their small charge. Regard not the colours of the mould, you see that Master *Bernard* he telleth you of a white, of a gray, of a black, and of a yellow Marl: And why may there not also be some other colours of Marl in our Countrey, which Master *Bernard* never knew? It is a small matter to try the severall natures of all the veins which you find in digging; you may prove of every kind a little, in divers places the first year, and so proceed unto greater tryal the next year, as your good successe shall encourage you.

And though you find but small amendment in the first proof, yet practise again; for it may be you laid either too little, or too much thereof upon the ground: For too little of the best Marl can do but little good, and too much thereof hath been already found to be very hurtfull to the Corn. And therefore

How to find
out Marl and
the use there-
of.

Colours of
Marle.

Proportion of
Marle.

Season to lay
Marl abroad.

Upon several
grounds.

In severall
sorts of grain.

Circumstan-
ces.

Fullers earth.

therefore untill you have attained unto the very prick of proportion, learn first all the experience which you can draw from other men, and then prove what further perfection you can adde thereto your self. Examine the seasons of the year, in which it is best to lay abroad every kind of soyl, for if the same be of a hard and binding nature, then Master *Bernard* tells you, that it must be laid in the beginning of Winter, that first the frosts may make the same to moulder into small pieces, and so to become apt for solution, and then the rain which commonly doth fall more abundantly in the Winter then in the Summer time, may perfectly dissolve the same. If it agree not with one sort of soyl, peradventure it will agree with another. It may serve an arable ground, and not a pasture ground; or a fenny, and not an hearby, or a clay ground, and not a sandy ground; Peradventure it may prove good for one kind of grain, and not for another. And therefore you must never rest till you have made a full tryal of all the inward veins of the earth, in all the seasons of the year, in all the degrees of proportion, in all kinds of grain, upon all sorts of ground, with all such like necessary circumstances, and so in the end you shall find out those differences, and make such observations to your self, as the sluggish and idle loyterers of our time (though they have the same matter to work upon) shall never be able to reach unto, or imitate.

The Fullers earth which Master *Bernard* here mentions in his title of Marl, and commendeth to the same end, I have not known at any time practised in England for the bettering of any ground; but by all presumption the same must of necessity be very rich, because it is full of that vegetative salt, so high-

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ly commended by this French Authour, which appears in those scouring effects, for the which it is divers ways had in use amongst us; and if the same be to be had in any plentiful manner, I could wish that some exact proof were made thereof, according to the former circumstances. And here I cannot omit the careful industry of that ingenious, though unlearned old man; Who having long since cut off that unprofitable exchange of our English silver, with those French and leaden trifles, hath also given himself to divers other profitable and ingenious practices; among the which he hath assured me of this one to be most true, that even the very clay which he digged up in Saint Georges fields, being laid upon his pasture grounds, which he there holds by Lease, did exceedingly enrich the same, insomuch as he did never regard to seek after any other soyl. And this hath also some credit with Master *Bernard*, who affirms, that all Marl is a kind of clay ground, and it should seem to differ onely in digestion from Marl. And in another place he sets down his opinion of a white clay, which he found as he travelled in France toward Poicters and Tours, that he held the same to be equivalent to Marl it self. And it should seem by all reason, that the like order is to be used therein in bestowing it upon the ground, as is before expressed in Marl.

Clay instead
of Marl.

I may not here omit to commend the soyl of the streets, or residence and grounds of all Channels, Ponds, Pools, Rivers, and Ditches, and of all other pans and bottomes whatsoever, where any store of waters do repose themselves, but especially where any abundance of rain water hath a long time settled, for that the congelative parts of these waters be full

The soyl of the
streets, & the
residence of
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of the vegetative salt of nature, as Mr. *Bernard* notes, who is verily perswaded, that there is no other reason to be given of that hearty fruitfulness which the fallow grounds do gather again in time, but onely the generative part of the rain water, which falleth upon them so often, whilest they remain untowen with grain: for to imagine that the earth by quietnesse or rest alone should become fat again without the ministring of any other nourishment or food unto it, were as much against all sence and reason, as to think that a languishing patient should in time recover his former strength by keeping of his bed onely, without taking of any cordial or restorative broths for his comfort. Wherefore seeing there be so many pans and recepracles for waters in every shire, in one place or other, and seeing that nature alone ministers matter enough for us to work on, but wants hands onely to bring things together, let us seek to help nature a little with our hands, and she will return our labour again with an excessive usury into our bosoms.

Moorish earth

There is also a kind of moorish earth, which being laid after 20 or 30 loads upon an acre, will amend, and better your pasture grounds a long time after.

Dung of
beasts.

I will passe by all the trivial uses of Cow-dung, Horse dung, folding of sheep, Hogs-dung, Pigeons dung, and such like, for that they are already known, and common in this land with every Countrey *Coridon*, yet I think it not amisse to set down some necessary observations in them, such as I have partly drawn from conceited wits, and partly have imagined my self by the contemplation of natures works. And therefore here I can by no means allow of the ordinary manner, in laying abroad our great muck-heaps, wherein Mr. *Bernard* tells us, that the winter rain

Muck-heaps
how to bee
made

rain which falleth upon them, carries with it also a great part of their strength, so as the upper part becomes very lean, and hungry, and is scarcely worth the carriage, and spreading abroad.

But I know that the Farmers of our land will answer me in this point, that it is too costly to build barns, or other coverts for Dung-hills; but my meaning is not to perswade them thereto (although peradventure if we did erect a few straight trees, or fir-poles, and make a loote thatched, or boarded cap to cover it, which might slip up and down at what heighth we thought good, as they use in the low Countreys to make their barns (a pattern whereof stands to be seen near unto St. Albones, not far from Parkmill, in the back side of one of my tennants houses there) that so the goodnesse of the soil would in a few years countervail the charge of our building) but rather that they would place the muck-heaps upon the foot of some hill (making a little square receptacle of brick in the bottom thereof) whereby all such strength and substance of the duug, as all the showers of rain that fall, shall carry with them, might with a free discent be conveyed into this pit or cistern, so as the same in convenient leisure might with scoops, and other shovels be continually turned upon the muck-heaps, from time to time as it fell, whereby the greatest part of the vegetative salt, which now is lost in every Farmers yard or back-side, might be preserved for the better manuring of the ground.

Some be also of opinion, that it helps much to the bettering of our dung, if all the brine and powdered beef broth, which is commonly thrown away, were powred upon the muck-heaps, thereby to multiply their salt. And Master *Barnabie Googe* will have all

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A covert for a
Muck-heap.

A receptacle
of brick.

How to rot
dung speedily

To have sweet
grass at the
first yeares
danging.

A rich Mold
for Gardens
and Orchards.

the suds of his landery conveyed thereon, and the muckheaps to be covered with boughs, to the end that the Sunne may not draw away any part of the strength thereof. And because we are now entred into the most principal, and general practise of this land, whereby the greatest part both of our pasture, and arable grounds are usually bettered; it shall not be amiss to set down some new, though a very easie course, how we may the looner bring our dung to putrefaction, and so thereby not onely obtain such rank pasture as now we have, by reason of the same soil, but also that we may purchase a much sweeter grasse, or feeding for our cattel, then hitherto we have had, for that (as I conceive) is the special fault of the first crop, which our ground brings forth after it is newly dunged. And this common error of ours (if I be not deceived) is easily helped, and that onely by making first a lay of dung of a foot in thicknesse, and then a lay of earth upon the same, and then another lay of dung upon that earth, and so proceeding in the manner of *Stratum superstratum*, till your muckheap be as large and high as you would have it.

But this practise would always be performed, either upon the ground which we mean to enrich, or very near unto it, lest that which we get in the goodnesse of the grasse, we do happily lose in the charge of our labour, and carriage. And here it shall not be altogether unprofitable, to let all those Gentlemen and Farmers, who are desirous of some special good mold, for some smal purposes, to understand that after they have disburthened the ground, of this great muckheap of theirs, that if they will yet dig a foot and a half or two foot under the same, that

that by this means they shall obtain a most fat and rich earth, and very apt for divers plants, as also our ordinary Gardeners can sufficiently witnesse.

Thus much of the soil or dunk it self, being dispersed in his gross body. Now a word or two of those conceited practises, which I promised before. I have heard some student practisers very confidently affirm, that if you steep your corn in water, the space of certain hours (but I could never yet find them all agree in one time : for some limit 12 hours, some 18, and some 36 hours, you may prove them all and keep the best) in water, wherein good store of Cow dung hath lain in imbibition for certain days, (which times you must also search, if you mean to be an exact master) every day stirring the same once or twice together before you lay in your corn, and after this preparation you sow the same (though in barren grounds) that so you shall purchase a most rich and plentiful crop with an easie charge. But this kind of practise I have heard both maintained and impugned as wel by reason as by experience, and that by men of good judgement on both sides, although if I would set down my own experience herein, I must needs confesse I could never yet attain to any truth in this secret, or to make any apparent difference between the corn that was husbanded in this manner, and that which grew of it self without any such help; yet will I not for the credit of the Reporters) altogether discredit the invention, for that peradventure I might fail in the nature of the grain, or in the time of imbibition. And as it should seem great store of those usual receipts, which are common in our ordinary Books of secrets, is drawn from this ground, whereby they labour to alter and change the

Of steeping
corn in dung
water.

smells, tastes, colours, and vertues of many fruits, and plants, onely by steeping the seeds in such aromatical waters, as they themselves appropriate for such uses as they intend them; and therefore they tell us, that steeping of seeds in the infusion of Wormwood, century, Coloquintida, and such like; will defend them from worm-eating, which for the present time I do easily beleieve, but how then comes it to passe that these seeds bring not forth also bitter fruit, according to their infusion? and yet it is generally thought, that the clove-gilliflower got his first scent from the Clove, which was conveyed into his slip; but this I hold for an erroneous opinion, and to be as false as old, for neither is there any Philosophical and inseparable combining of their two natures, performed in this gross practise; neither can so smal a substance, being neither truly prepared, nor exalted before, extend it self so infinitely from one slip to another, as we see daily perform'd in that sweet & beautiful flower.

I have here yet one experience more to set down in this kind, which (because it was the practise of a spiritual Lord, that died of late, and sel out very happily, as I have been credibly informed by one of his especial Officers, who with divers others was an eyewitness of the same) although it vary not much from the former course, I will publish the same unto all posterity, under such credit as I my self did first receive it. And therefore, whereas before you steeped your corn in the water, which had sucked out the strength or salt of the dung, you must now mingle your dung, your water, and your corn together in a great vessel of wood, and you must stir the same well with an apt staffe for the purpose, one whole hour at the least: This work you may begin in the afternoon,

afternoon, and toward evening you must recontinue your first agitation for one half hour, or more; then let these substances repose themselves all the night following, and in the morning, or sometime the next day, you must suffer the waters to passe away by some rampion, according to the manner of the saltpeter men, and when the liquor is sufficiently dreined, then mingle the corn and dung thoroughly well together, and after sow the dung, and corn so mixed in a barren and hungry mould, and you shall have as rich a crop, as if the ground it self had been dunged before. This experience was made in an heartlesse piece of ground, which lacked also one tilth, and which no man durst adventure to sow with any grain and yet my Lord Bishop did by this means attain to a most plentiful wheat harvest.

Now let us proceed to the sweetest, cheapest, and most Philosophical Marl of all other, even that which both *Valetius* and Master *Bernard* have so closely, and Theorically handled, as that (notwithstanding the one telleth us of the exceeding fertility that is found in salt waters, by that infinite generation, and multiplication of fishes, yea of *Venus* her self, that *Primum mobile*, in the procreation of children; and the other of those pleasant grapes growing in the salt Marishes of *Xanteign*) yet neither of them have left us any assured means, how we may purchase any store of this salt, whereby we may make any great use thereof. So as notwithstanding we are now brought to the rivers of life, and to that goodly tree so laden with golden apples, yet here we are left with *Tantalus* to starve and perish for want of food. Yea *M. Bernard* himself, after that he had so sweetly seasoned our ears with his brackish Philosophy, yet in

A practically
discourse upon
salt

one place, (as if he had repented himself of his too much forwardnesse in these his secret discoveries, nay, as if he had the greatest secret of nature in hand) he tells us in plain terms, that it is not the common salt, but the vegetative salt which he so commends. Nay, that which is more, in the examination of the Judges censure, upon the grounds of condemned persons, wherein they would have their lands to be sowed with salt, in token of a perpetual barrennesse, he falters and staggers, and can find no reason to maintain their judgments, unlesse it were as he saith, in respect of the nature of some countreys, where salt was enemy to all seeds. Why how now Mr. *Bernard*? Is it possible, that you who could find out the means how to furnish us in all places, with new springs of sweet and delicate waters, where there was never any before, that could first find a fifth element, which nature had hitherto locked up in her own coffers, which could teach us the reason of all petrifying, vetrifying, and metalizing of earthly bodies, yea, who could so learnedly set down the generative reason of all vegetables, should be ignorant how to reconcile earth and salt together, or how to turn a common salt into a vegetative salt? Yet *Valetius* deals more plainly with us (according to that light which he had received) saying, that if too much or too little do in any one thing make an apparent difference in the effects, then surely of all others the same is most especially to be seen in salt; and so he would have the cursed effects of that sentence, to proceed from the excessive proportion and quantity of salt that is bestowed upon the malefactors grounds. But suppose that *Valetius* hath not onely aimed fair like, a Gentleman, but also hit the mark like a good Arch-

er in this, where is now this vegetative salt become, which Master *Bernard* so highly extols, or how shall we obtain any store thereof for the enriching of so many acres of barren ground, as this Realm of *England* doth present unto us? Me thinks I am now in the midst of a stop galliard, and were it not that I should here offend so great a concourse of people, as I have now gathered together in my own conceit, I could find in my heart to command the *Violands* to cease, and so to break off in the midst of a rough *Cinquépasse*. Neverthelesse craving pardon of all the ancient *Phylosophers* herein, but especially of Mr. *Bernard* (who if he had been disposed could have eased me of this labour, and performed it much better) I will onely request with *Sinon*, *Fas mihi Graiorum sacrata resolvere jura*, and so bestow a new task upon nature, who will be ready to yeeld us great store of the richest *Marl-pits*, and in such as have not hitherto been discovered, but onely in *Philosophical* terms to any nation, or country whatsoever: hoping thereby, that as the secret which I have now in hand, and seemeth almost incredible before it be disclosed, shall procure some further credit and belief unto the rest of my inventions, whereof I have already given a taste, by a publick impression, and yet reserve some few, till I find a better opinion conceived of *English Artists*.

Now then let us first examine, what essential difference wee can find in those four elements, whereof all the inferior bodies do consist? or whether they may be all reduced to one, notwithstanding the manifest opposition that seems to be in their contrary qualities? And for my part I must here acknowledge that the best naturall *Philosophy* that ever I could

could learn in this point, was neither out of Aristotles Physicks, nor Velcuries natural Philolophy, nor Garfceus meteors, nor out of any of the old Philosophical Fathers, that writ so many hundred years past; but that little which I have, I gathered it on the back side of Moor fields, where by undoubted arguments, I did hear it maintained, that all those elements do onely differ in attenuation and condensation: so as earth being attenuated becomes water, and water condensate becomes earth; water attenuated becomes ayr, and ayr condensate becomes water; and so likewise ayr attenuated becomes fire, and fire condensate becomes ayr: and thus all of them spring from one root: which being admitted, is a manifest proof, that there is a great and near affinity between the land and the sea, where we shall find salt water enough for our purpose. And yet further we see that of the earth and water together are made one globe, so as a small matter will make them friends, being so nearly united together.

And now I may say that I am entred into a whole sea of matter, from whence I must fetch the greatest store of my vegetative salt; and if this storehouse fail me, I know not whither to repair for such plenty of salt, as I must be forced to use in this action. And because you shall understand that I am now in a right course, let us consider of a few experiences already performed in the like kind; which because at the first they were found out by meer chance, and not by judgement, the Authors of them could as yet never extend them to any general, or publick use; but have hitherto walked continually like petite Constables within their own precincts. Amongst the which, the first practise than ever I heard

heard of, was of a silly swain who passing over an arm of the sea with his seed corn in a sack, by mischance at his landing fell into the water, and so his corn being left there till the next low water, became somewhat brackish, yet such was the necessity of the man, as that he (notwithstanding he was out of all hope to have any good successe thereby, yet not being able to buy any other) bestowed the same wheat upon his plowed grounds, by the advise of a Gentleman of good worship, from whence I received the report thereof, and in fine when the harvest time came about, he reaped a crop of goodly wheat, such as in that year not any of his neighbours had the like, and yet notwithstanding (for ought that ever I could yet learn) neither he nor any other of his Countrymen would ever adventure to make any further use thereof, belike being perswaded, unlesse that the corn by chance fell into the sea it would never fructifie.

What should I speak here of him, that of his own mother wit sowed a bushel of salt long since upon a small patch of barren ground at *Clapham* which to this day remaines more fresh and green, and full of swarth then all the rest of the field about it? But this man had some more reason than the other, not to prosecute so chargeable a practise any further, for that he knew well that one bushel of salt would countervail two loads of the best dung there, whereas the former practicer, might have had sea water at will for the fetching.

I might here adde the daily, and usual practise in the West parts of this land, where the people to their great charge in carriage, do convey the saltish sands, unto their barren grounds, whereof some of them do lie five miles distant from the Sea. And yet

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they

Salt sowed at
Clapham.Brackish
sands.

they find the same exceeding profitable, for that thereby their inheritance is enriched for many years together, and who seeth not that the whole strength and vertue thereof consists in the saltness, for otherwise we might happily find some other sorts of sand that would also be equivalent unto this. But to set down one experience that may serve for a thousand because it consists of nothing else but salt. So that here is no partnership at all, no ace of hearts nor five fingers to be suspected.

The brine of
the salt-pits,

Before you sow your ground, do but onely mingle two bushels of bay salt, amongst two bushels of winter grain, and so disperse them together upon the ground, and you shall find a good increase of corn, and the land it self much bettered, and cleared of weeds, as I have been very credibly informed. But of all others I wonder most of all at the ordinary experience which hath so long time in the view of many persons, been yearly practised in the fields, near adjoining to the salt pits of *Nantwich*, where upon the fall of any great store of land waters into their pits, being forced to empty and draw out all the fresh water which alwaies floates upon the brine, and to bestow the same in such places as are nearest, and therewith also emptying some of the brine with the fresh water, they find in time this earth so strongly seasoned with these brackish waters, that no soil or dung is comparable unto it, for the manuring of their ground. And is it possible, that so many sharp and choice wits should till this day neglect so rare, so rich, yea so inestimable a trial as this, and not one among a thousand that hath rid from thence to *Westchester*, should have been able to have carried the secret so far, but must so carelessly drop the same by the way.

But

But to come yet nearer to our purpose, what shall we say or think of the surrounded Level at *Erith*? I dare not report that exceeding fertility which I have heard commended in those two breaches, even by the several Farmers thereof: and though we may in some measure excule our grosse capacities, for not applying those visible effects of the brackish waters which had many years together reposed themselves in the greater breach, because the same was but lately inned, yet what shall we say for the lesser breach, which hath been won so long since? Was it not sufficient to have buried so many thousands of our English pounds, in those Dutch and drunken devises about the gaining of the ground (in the time and charge whereof some English wits that I could name, did offer to make a great and gainfull accurtation, and yet could not be heard, but that whereas nature herself presented in those breaches, a full recovery of those expences to such as are studious, that yet we should remain as blind as Beetles, not once examining, from whence this abundant fruitfulness should spring, or grow? Now I find that saying of the Philosopher, as concerning nature, to be most true: that she doth offer and discover her self in the most plain, and usual actions, wherein we do daily busie our selves, and yet scarcely any man doth apprehend her. The silly country wench churns cream into butter with a simple staffe, and in a plain vessel, onely by stirring up the inward fire of nature in his own center, whereby it makes a true and Philosophical division of parts, yet who is the wiser for it.

But to return to our salt again, and to give some colour to this weak contemplation of ours, peradventure some men (and those also not of the meanest

conceit) who having a continual eye upon the salt marishes, where every acre of ground is so little worth, do therefore utterly condemn the use of brackish waters, as the wastfull destroyers of all generative vertue. Indeed I know, and have found it most true in my own experience, that if any vegetable whatsoever, have by mishap taken any salt water, that the same is most unapt to be stirred up to any true or kindly workmanship, but the reason hereof I must conceal for a time, it shall now suffice to answer that other objection, which seems like a forceable Ram to beat down all the foundation and building which we have hitherto made. But this I may sufficiently refel by that *Nimium* of *Valetius*, which is daily to be seen in those marshes, and makes the grasse thereof even brackish to all the cattel that feed thereon, although in the manifestation, and whole discovery of the secret which I have in hand, the same is elsewhere more fully and plentifully answered.

What is then remaining, seeing that the salt of *Clap-ham*, those Western lands, that brine of the *Cheeshire* salt-pits, the residence of those brackish waters at *Erith*, do offer so lively demonstration unto us of the undoubted fertility, which is ready to overflow our banks, if we will but onely give passage unto it: but that we do now and then suffer a voluntary inundation and deluge, by those brackish waters of the sea, upon some parcel of land that is adjacent thereunto? which after they have sufficiently reposed themselves thereon, we may by convenient sluices return the same again; and so leave the earth to her own workmanship, who by her inward heat and transmuting nature will in some reasonable time, by way of putrifaction, convert that which was
before

before a common salt, into a vegetative salt, so as although we had just cause before to fear the extreme drying or burning nature of salt, yet now, when the same is made familiar, and as it were of one nature with the earth, it becomes a most enriching substance. But lest (whilest I go about to benefit the poor and honest Farmers of the land) I happen by these new devises to hurt and hinder them, against my will and honest purpose; I would wish them first to consider advisedly of the whole discourse, and to read it over again and again, before they put the same in practise, lest peradventure they take a sword by the point, and so hurt themselves by the weapon which was given them to defend their persons. And let this be a general caveat unto them, that they begin with small practises, and first upon arable grounds, before they proceed to pasture or meadow: and so being carefull in those former circumstances, which I have at large handled in the title of Marl, they shal no way indanger their estates nor hazard any great losse, before they attain their desires. Neither would I have them perswaded, that my meaning is, that they should overflow any grounds, which either they have sowed already, or mean to sow presently with their grain; but rather some wast ground or other, which after it hath been glutted with salt water divers times, and then reposed it self a sufficient time, might serve instead of Marl, or other dung to spread abroad upon their barren corn grounds; but how often the same should be overflown, and in what time the earth will sufficiently putrifie and transmute the salt, before it will be serviceable in this kind, I will not here determine: Yet since the same is so well performed near the

salt-pits where there is not any artificial observation at all made, I think him to be of a very gross conceit, who after he hath conferr'd with those of *Nantwich* in this behalf, should not be able to effect the like in any parcel of land that borders upon the sea, or any arm thereof; yet it shall not be amiss for them to know the difference, that the brine of some of those salt-pits doth hold one third, or one fourth part of salt, whereas the sea water doth not for the most part contain above one eighteenth or twentieth part of salt, which would make a great difference betwixt them, but that much land water is also laded out of those pits among the brine.

And now by this time I hope you are well furnished with salt at an easie price, as also with the means how to make the same of a vegetative nature. It were but in vain here to intreat of the nature of that salt, wherof the salt-peter men do gather a bushel or two at the most, from 30 tuns of earth; and therefore how excellent soever the same be in his kind, it will not profit us much in this work, because the store thereof is so little. Now I will proceed to some other sorts of soil, which be excellent in their kind, but most of them appropriate onely to particular places, & some of them not to be had in any great quantity, and therefore fitter for gardens, or for the trial of masteries, then for the enriching of arable or pasture grounds, amongst the which, I will allot the first place to the putrifaction of vegetables, because there may some reasonable store be had in some of them, in certain places; and then to the calcination of them, whereby they are first reduced to ashes, and after those ashes may be dispersed on such barren ground, as the proprietors of them shall make best choice of.

And

And for ought that I could yet imagine, I hold the brakes or Fern to be both the cheapest, yea most plentiful, and that which may best be spared of all the unnecessary weeds that grow: and that you may sooner rot and putrifie them, you must mingle good store of earth amongst them, or else make severall bed or lays of earth or fern one upon another, till you have made as it were a large muckheap of them, and so let them rest till they be wholly consumed into a fine earth, or mold. Although I could name a Yorkshire Knight, who onely bestows the fern it self in some good thicknesse, throughout all the allies of his hop garden, whereby both the roots of his plants are kept the moister, and also he doth yearly gather a rich mold out of his allies, to amend and better his hop hills withall.

How to putrifie Fern speedily.

And here I have just cause offered me to commend also the manner of poling of his hops, which he placeth in such sort, as that one plant may not shadow another, but that his whole garden receiveth the fulnesse and strength of the Sunne beams at once, whereby both his Hops are more kindly, and the bells of them much larger then in any other Hop grounds whose poles are erected and stand upright after our ordinary and grosse manner. But because my promise was not to deliver any skill at all in Hop Gardens, I will reserve this conclusion with some other secrets in Hop grounds, not yet discovered or brought in publick use, for some apter occasion, *ut semper novus veniam.*

New manner of poling of Hops.

And that I may not seem to have lost my self in the midst of these brakes, into which I am now so deeply entred, I would have that which is here spoken of the Fern onely to be generally understood of all

The earth in Willow-grounds.

all sort of plants or vegetables whatsoever, where-with the earth seems unprofitably charged.

Hair.

Divers also have found singular profit in the hair that is gotten from the hides of beasts being thinly laid upon the ground, and suffered to putrifie.

Calcination
of vegetables.

Now as we may by the putrefaction of the fern, & other plants, in divers parts of this realm make the same very profitable unto us for such country purposes as are here intended; so likewise by calcination of them, or burning them to ashes, we shall find the like and self-same effects, as divers shires in *England* can already testifie in their own experience, who consume their fern, stubble, straw, heath, furs, sedge, bean stalks, and sometimes the very sword, and swarth of the ground to ashes: and these according to the store of salt which their ashes do contain, do either for a longer, or a shorter time enrich their barren grounds.

Malt dust.

And because that nature may be known to be so cunning an artist, as that she hath not made any thing in vain, the wit of man hath also found out some good use this way, even of the dust and tails of the Malt, which are left in malting, for these being also returned upon the grounds from whence they came, do help in some measure to hearten them again. The proportion of them is about three quarters to an acre of ground, but this secret extends only to malting towns and there also but to a few acres of ground, yet I thought good to insert the same amongst the rest, as a member of that body, which gives unto each subject his generative, and fructifying vertue.

The earth in
willow-trees.

I would greatly commend that fine and delicate mould, that is found in the bodies of old large and hollow willow trees, that are putrified within, if it
were

were as plentiful to be had, as it is rich in substance, yet happily how small the store thereof be, it shall not be lost for the gathering, after the best uses thereof be found out, and known among the studious practicers of our age.

And here because of all other places, I would be loth to leave the most renowned City of *England*, wherein I was born, without some further and sweeter helps for the barren grounds, then she hath been hitherto acquainted withal, and for that I daily do see, a most rich commodity trampled under foot, and contemned of all men, I hold my self even bound in conscience, for my countries good, not to hide the same any longer, but rather to publish all such profitable uses thereof, as I conceive my self or have learned of others, together with a full satisfaction of those objections; which have been grounded upon the long discontinuance thereof with the Low Country men of *Flanders*, who are generally accounted the most skilfull and painfull husbandmen of all *Europe*. The matter which I mean, is the waste sope ashes which our Sope boilers for the most part, will give for the carriage, and some of them also do pay for the carriage, when they are conveyed from their houses: though some few of them make a small benefit of these ashes.

And here it shall be no shame for us to acknowledge those Flemmings to be our first teachers, in the use of them: nay, it is rather a great shame, that we cannot be provoked to our own profit, by the example of others, who have so many years enriched themselves thereby, and have of late years to their great loss, been forced to leave them. As concerning their good opinion, and profitable use of them,

I think we need no further argument to maintain, shen the price which they gave for them to the Sope-boilers, which I have credibly heard, was 3 s. or 4 s. a load, besides the carriage of them into their own country.

And yet if the infinite extension of them, the easie charge in bestowing of them, together with their especial nature in suppressing of weeds, be wel weighed and considered, we shall find them to be much cheaper of that price then any common soil, or stable dung whatsoever. For how cheap soever our other soil be, yet the transposing thereof from place to place (if the land lie at any distance) makes it so chargeable, that the poorer sort of Farmers in many places of this realm, will scarcely afford the carriage thereof to their grounds, though they might have the same freely given them; whereas two load of these ashes or thereabouts, being sufficient for an acre of arable ground, is soon bestowed by the labor of one man, without the help either of cart or horse. For their manner about *Bridges* was, after they had sowed the same with grain, to strow these ashes thereon with their hands till the ground did seem to have gathered a whitish garment upon it, and that was sufficient for that year; and by this practise they might sow the ground yearly without leaving it fallow at any time: Yea, their ground being helped in this manner, would yeeld them a most rich crop of Flax, whole seed of all other doth burn and pill the ground; for so saith the Poet, *Vrit enim lini semen*. It is also with good probability to be conjectured, that these sope ashes do not onely enrich the ground, but do also help to destroy worms, weeds, and rushes, that do spring up in moist and barren grounds;

grounds; then let every wise man imagine what may be saved thereby in that chargeable weeding of woad. *Qre.* If broom or fern may not be destroyed by this means; and I make no doubt of broom, if the ground were first plowed, and after these ashes scattered upon the same.

And because I would not rely wholly upon the outlandish experience of those ashes, (lest otherwise it might happily be objected, that they are not agreeable with our soil or climate) I have thought good to prefix in the front of this Treatise, the portraiture of an Ear of Summer Barley, being drawn truly and sharply, according to the length and breadth thereof; which together with sundry others of the same proportion (as by divers eye-witnesses of good credit, I can prove and justify) did grow this Summer at Bishops-hall, where I dwell, to the great admiration of the beholders: the stalk of which together with the Ear was measured to be an Ell, and 3 inches in length, from the ground to the summit thereof. And this I did in a barren ground, by the help and means of those sope ashes, God blessing my labours therein.

I have also this year found the like success thereof in pasture ground, by the means aforesaid, *Qre.* If that sope ashes will not enrich the ground for woad, as that thereby we may continue our yearly sowing upon the ground, without any intermission thereof. *Qre.* Also, if the same be not very profitable to be laid amongst the Hop-hills, to make the plants to flourish and prosper the better. For in Lombardy, they like so well the use of ashes, as that they esteem it much above other dung, thinking dung not meet to be used, for the unwholsomnesse thereof. This out

of Master *Barnabie Googe*, who also affirmeth in another place of his book of Husbandry, that if we will have the Artichoke to prosper well, we must dung the same continually with ashes, for that kind of fruit delights therein.

And to make the same out of all question, I know a grave and well experienced Citizen of London, who hath made often tryal of them, and hath found very good successe, by applying them in the Winter time to the roots of his own Artichokes. Now if we will also look into the reason hereof, we shall find it to be nothing else but the salt of these ashes, which notwithstanding all that sharp Lee which the Sope-boiles have drawn from them, do yet remain much stronger, and more saltish then our best ashes, that have not as yet been put to any use; and this will easily appear in some of those other uses, that follow hereafter. All which being well considered, I do hold the same better for Winter then Summer corn, and very profitable for all cold and moist pasture, and meadow grounds, so as they be laid upon them about the feast of All Saints, that the great showers in the Winter time may make them of an easie solution; whereby the grasse may have a more speedy attraction of their vegetative salt unto it.

Some be of opinion that these ashes be made for the most part, of that tree which carries a small leaf like unto our Oak, and whereof the Dainick Wain-scot is made. And some others do commend another tree, that somewhat resembles our witcher Elms, of whose boughs and branches, being burned, they gather these ashes. But it is most certain, that they are not the ashes of any one tree, but of divers that are consumed together, as they grow in some great wood,

wood. Now these ashes by a more violent kind of fire, being forced to a fusion, whereby they cake and clod together, are then called by the name of Sope-ashes. But how then commeth it to passe, if there be such salt and strength remaining in these wast ashes, that our Flemmings (who will not lose so much as the parings of their nails, much less the use of so rich a commodity) should wholly abandon them, and for so many years together discontinue all their trafique and bargaining with our Sope-boilers? It should seem by all likelihood that though for a few of the first years, they found some heartening thereby unto the soil and ground whereon they were bestowed, yet in process of years, that these ashes being yearly renewed upon the same land, did in the end leave some hard or barren crust, or *caput mortuum* behind them, whereby the ground became either for a long time, or wholly unprofitable ever after.

These objections being thoroughly answered, and confuted, I hope I shall find an easie sute of it to intreat all our London borderers, who do occupy themselves in the affairs of Husbandry, to step into the Dutch mens rooms, and to neglect no longer so rich and so bountifull an offer. Neither yet will I here rely upon those late troubles and turmoils of the low Countreys, which hath been means to cut off a great part of the intercourse between them and us, and to make them almost unwilling to perform any profitable practise for their own good, least the enemy should like a drone Bee devour their honey: nor yet on any new exaction that hath been demanded of them upon the transporting thereof, whereas in times past they did carry them freely away for ballist; but I will only at this time urge that countermanding priviledg

first granted upon a colour or pretence to have imployed them very profitably upon the making of salt Peter, and brimstone within this realm, whereby all the Sope-boilers were prohibited from the sale of them to any such as would transport them, although the Patentees could never as yet with all their chymical skil, draw out or separate one pound of Peter, or brimstone from them. And for my part I am undoubtedly perswaded that their first purpose was no other (however the same was masked, or disguised in shew) but onely to force the Sope-boilers (after they had procured a general restraint) to grow to composition with them for setting them at large again, which appeared most manifestly to be so, for that in the end they demanded a certain rate upon the tun, which they denied, and thereupon the first discontinuance of them grew betwixt the Flemings and the Sope-boilers. And thus I hope I have removed this stumbling block out of my Country mens way, whereby they may begin a fresh practise of them, and thereby make some use of that Patent, which hath by this time gotten a sound sleep, and is now awaked in a good hour.

And as concerning any bad accident that they should in time leave behind them: their melting and soluble nature, whereby in one years space they are wholly consumed with those showers, & frosts that overtake them, is a sufficient argument to convince all doubts that can possibly be objected this way. But now to some other uses of them: I do find them much better and cheaper then the Masons dust for the scouring of our trenchers, and other wooden vessels, and this can our Dutch liskins, and Kitchen maids well approve, whose dressors, shelves, and molding-boards,

boards are much whiter and cleaner kept, then those which are washed, and scalded after the English manner, upon which reason they must of necessity be very serviceable for washing of all our wooden floors either of Deal, or Elm to cleanse them of all their grease, spots, or soil whatsoever; and I make no question but that we shall find them very excellent for the scouring and cleansing of our glass windows from all the steins, filth, and cloudiness; that makes them in time so darksom unto us. I will pass over the use of them in the paving of the streets, and laying of bowling allies, wherein many hundred loads are yearly consumed in *London*, and the Suburbs round about it. But I may not omit that excellent and ingenious practise, of that skillful and ancient Sope-boiler, who looking advisedly into their binding and knitting nature, hath to his great credit erected a fair, a strong and costly building of brick, in the mortar whereof, he bestowed good store of his own sope ashes, which to this day continues firm and solid without any shew of ill accident happening by these ashes) as any other building, whose stones were laid onely, with lime and sand. By whose good example many other also of latter times, have occupied many hundred loads of them for the same purpose, and would have spent many thousand loads of them ere this day, but that they find this mortar somewhat rough in the laying, and more sharp and trettull to their fingers then their usual mortar which they daily occupy. But if I were able to be a builder my self, I would soon remedy these two slender faults, whereof the latter I hold rather for an excellent quality, and most appropriate for the nature of mortar it self, rather then a fault. And yet for the good wil which I bear to al the
excellent

excellent uniform builders of our time, and because thereby I shall give some increase of labour to the poor and painfull people, that may be imployed therein, I will set down the best advise that I can in this behalf, the same being such as I dare make warrant thereof upon my credit, being carefully handled. As concerning the roughnesse of them, who is so blind that seeth not which way to remedy the same? For it is rather a work of labour then of skill? For they being either ground or stamped into a fine powder, before they be mixed with the sand, will soon be brought into a smooth temper.

And here we have no need to fear the charge that will arise thereby, for I dare undertake that the profit of one days labour will answer the charge of three mens wages, in the difference of price that will be found between one load of these ashes, and one hundred of Lime. The sharpnesse wherewith they offend the Bricklayers fingers, may in some sort be avoided by wearing of gloves, (without the which they seldom lay any brick at all) to avoid the like effects which they find in the lime. But for an assured help therein (if the same be such as cannot be indured of workmen) let these wast ashes be re-imbibed with more water for some reasonable time, till some further part or proportion of their salt be divided from them, and then without all question they shall find them gentle enough, and much of their fretting nature taken from them. See the whole art of making of the mortar set down, *Numb. 92.*

For buck
cloaths.

The last, though not the least use of these ashes, which I purpose to discover at this time, is to make them serviceable instead of common ashes, both for the whitening of linnen, as also for the making of buck
lee,

lee, which are now grown to an excessive price, partly by the great expence of them in salt Peter work, but principally through our lately sparing of wood, and charcole whereby these latter times do not afford the like store, or plenty of them as we were accustomed to have in the days of our predecessors. And I am the rather induced to conceive wel of them in this course, by that ancient and common experience, which the whitsters, and Dutch laundresses have long since begun, and do as yet continue among us, for the speedier whitening of yarn with them, which they do most confidently affirm to become more white by this means by once bucking of it, then by sundry times with our common and ordinary ashes, and if they shall be found over strong, and sharp for our linnen (which is the onely fault that I could ever hear them charged withall) I doubt not but that by the aforesaid manner of imbibition, they may be so weakned, as they shall easily be reduced to the perfect strength of our ordinary ashes: or else for our better satisfaction herein we may use such proportion of our ashes among them, as may best bring them to be of one nature & quality with them. Thus much by way of digression of the several uses of these waste ashes, wherein though I strayed a little without the bounds and limits of husbandry, yet I hope I shall be found sufficiently within my text, for that all these particular uses may seem to maintain and fortifie their fructifying nature the more, because they are wholly drawn from that vegetative salt, wherewith the same above all other ordinary dung whatsoever, is most fruitfull and abounding.

Thus much of vegetables, now a touch of Animals, and so I wil knit up this discourse, leaving those

Salt of Minerals.

Pilchards purified.

Garbage of Fish.

inestimable and hidden treasures of the minerals, and their salts, tending also this way unto the deep Lullists, and true English Paracelsians, who no doubt, if they lived in thankfull times, would begin where I have left, and not onely have published their Philosophical salt, which nature should have been forced to maintain for ever, but would also have laid open a very large vein of golden Marl, whereby they would have so multiplied that radical moisture of sundry plants, as that in some good measure they should have recovered that first perfection wherein they were created, and which they lost by the fall and disobedience of man. I am credibly informed (and the reason thereof is so apparent, as that none but he who will deny the conclusion of a Syllogisme can deny the same) that after such time as the coast-men have by expression, and other apt means, gotten that kind of train oyl, which they call a Pilchard oyl, from the fish of that name, that they also bestow that which remains of the Pilchards upon their lean and hungry grounds, the substance whereof, by putrifaction, becomes a most rich and fruitfull mould, and such as gives heart unto the earth for many yeares together.

And it is no way to be doubted, but that the carcases and garbage of all other fish, would produce the like effects, for that they must of force resemble the nature of the place wherein they breed and live, whereof we should have had a sufficient trial before this, but that there is no such store of any other fish so fitly presented unto us for this purpose as the Pilchard, which serves to no other use, after separation made of the oyl, but onely to ingender this salt dung, which we have in hand.

Now

Now concerning the Bloud, Offall, and Entrails of ^{Bloud, Offal, and Entrails of Beasts.} beasts, every Butcher about *London*, who for the most part hath a garden for that purpose, to bury the same in, to avoid offence, can sufficiently testifie. And I have heard the bloud of beasts commended in high terms, for the forwarding and prospering of all poor and backward Vines, so as withall it be tempered with lime, which is used to no other end, but only to destroy all the worms; as otherwise the bloud would ingender in the earth, which would in time consume all the sap and marrow that lieth in the roots, and in the end destroy both the Root and the Vine. Yet this caution I will give before I conclude, that he which tempereth lime with the bloud, must suffer the first accidental heat, which happens in the slaking thereof to pass over, before he apply the same to the root, either of the Vine or any other plant, lest that unkindly and unnatural heat, (which for the time is stirred up in the composition) do happen to burn and dry up that radical moisture, which will hardly be restored again by any outward art or means whatsoever.

Claudite iam vivos pueri, sat prata biberunt.

105. *The manner of drawing or extracting the Oyles out of Herbs or Spices, with all necessary circumstances.*

A Copper body, or Brasse pot, with a Pewter Limbeck, and a glasse Receiver, are all the necessary instruments for the extracting of these Oyls; and the greater the pot or body is, and the more you distil at once, you make both the lesse wast, and the Oyls will be in lesse danger of adustion.

Let the middle pipe of your Limbeck, through which your oyl and water ascends, be as large again as the ordinary pipes are, and much shorter, and let the bucket, or cooler in the head, contain as much more cold water as our ordinary Limbecks do.

If you have cause to draw much oyl at once of one sort or kind, then use the first water again for the *vehiculum* in your second drawing, because the same hath already received his glut of the oyls, and will not be so hungry to devour your oyl as new and fresh water, that hath not been used to the same purpose before.

The water in the cooler may not boil; but you must change the same so often as it grows scalding hot, and put cold water in the place thereof.

You may begin your distillation with a pretty strong fire until the oyl begins to ascend; but afterward let your fire be so temperate, as that your pipe that runneth into the Receiver do never blow, but onely drop apace, or run trickling down the Receiver.

Some use to macerate, or infuse the spices, the night before they distil, luting the Limbeck to their Brasse pot, or Copper body; the best use thereof is in my conceit, that the paste or lute will be so much the drier before they begin to work, but I think they gain not any more oyl by that practise. And yet a Neopolitan promiseth to double the oyl of Aniseeds, by macerating them ten days before distillation.

The flowers of Sage, Time, Rosemary, Lavender, &c. yeeld more oyl then the leaves, and the seeds more then the flowers.

To every pound of seeds or spice, and a gallon of fair water at the least.

Beat your seeds and spice somewhat grossly, before you put them into your pot or body.

All such herbs whereof you mean to draw any oil, would be laid abroad in the air to dry, five or six days before you draw any oil from them; for so you may distil both more at once, and also you shall have more store of Oil.

Those herbs which are hot either in smell or taste, will give their oil in this manner in more plenty then those which are of a mild or gentle smell or taste: as the sweet Marjoram, Rose, &c.

Most of your Oils wil float on the top of your water, yet the Oil of Cinamon and Cloves wil fall to the bottom, in the manner of a *Balsamum*; and some hold it for one true mark of a natural *Balsamum*, it being poured into another Oil, it sinks to the bottome.

Your paste must consist of Bean flower, or other course flower tempered with water onely, or some whites of eggs well beaten, and during your distillation, you must have some paste ready to stop all such breathing places in the joynt, whereat any wind shall issue.

Let your Receiver, being of Hesson glasse, contain two gallons, or three pottles; and for your Receivers you may chuse those glasses which they call bodies, when they are once cut off with hot irons, and fitted to their helms.

For the most part you shall have all the oyls of your herbs or spices to ascend with the first pottle of water; nevertheless, for the more surety, you may draw off a gallon, and prove what you can gather out of the last pottle.

You may divide your oyls from your water, by putting the water and oyls being temperately warm, either into a large head that hath a short pipe, or for want thereof into a great glasse funnel, staying your finger at the bottom of the pipe, till all the oyl do flore above the water (except in cloves and cinamon) and then letting the water to have a gentle passage by lifting up your finger a little, untill you see the oil ready to run out with the rest, which you shal easily perceive by the difference of their colours, and then stop the hole with your finger again, and receive the oyl into a severall glasse by it self.

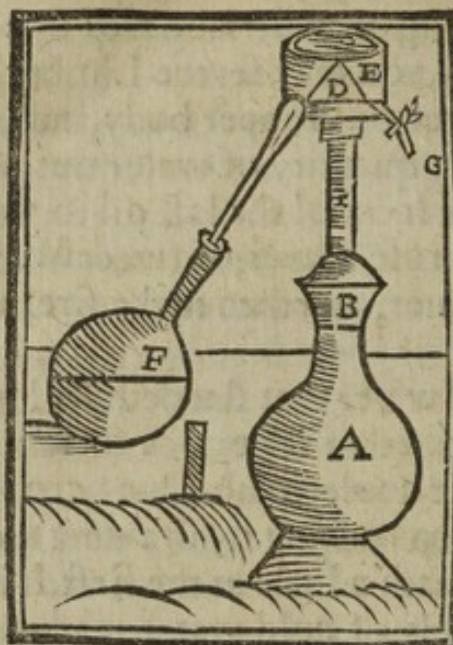
When you have divided the oyls from the waters, then may you rectifie or purifie them in this manner. Put all your Oyl that is of one sort into a glasse body, and hold the same carefully in some hot water, moving the same up and down at the first, lest you break your glasse, untill all the water be evaporated, and that you perceive the oyls to become of a clear and transparent colour, and then keep them in apt glasses. Most of all these oils will last exceeding long, and to say truly, I know not how long, for I have not found any of them to fail, or lose their grace, except the oil of Anniseeds. But some instead of clarifying in the manner aforesaid, do use to redistil them again in smal bodies, and heads of glasse with some of the first water, and some draw them from Rose-water. Note that in this rectifying by ascension you shal lose a great part of their tincture; and if I be not deceived, a great part also of their strength & virtue.

If you have cause to draw many oyls one after another, having but one Limbeck for them all, let the Oil of Anniseeds be one of the last which you draw, because it will season the Limbeck so strongly, that you

you shall hardly get out the scent, but with great labour. And for the sweetning of your Limbeck upon every change of strong oyl, you may set the Limbeck loose upon the pot of water or Copper body, and to urge up with fire, a great quantity of water out of your pot, till you find the scent of the last oil to vanish; or else put some dry rose-leaves, or sweet Marjoram leaves into your water, and then make fire, as before.

Let the passage of your water that standeth still in the cooler, be very large whether it be cock or tam-pion. Some do empty their cooler with a long crooked pipe, and set the same on running by drawing the water down with their breath a little at the first. It is very requisite to have vessels of cold water ready at hand to pour in presently upon the emptying of your cooler, or Bucket; and if the same Vessel be of equal reception with the Bucket, you shall find your labor the easier. I know some that to avoid the continual labour of filling and emptying of their cooler have placed a large vessel full of cold water in such manner, as that the same by turning of a cock may run dropping continually into the cooler: and in like manner the Cock that is fixed to the cooler may deliver as much water into another vessel as it received from the uppermost.

Some



Some hold opinion, that the best drawing of all vegetable Oils, that will congeal in cold weather, is in the Summer, or Spring time, but a workman wil both draw them and divide them at all times of the year.

Let there be always one third of your pot, or copper body empty, that there may be sufficient room for the Spirits to play in.

106. *How to Rectifie the afore-said Oyles.*

VVhen you have gathered some store of oyl together, put the same into a small glasse body, or cucurbite, setting the same in a gentle Balneo, till all the water be evaporated from the Oyl, and that the Oyl become of a most clear and bright colour. This manner of rectifying is used in the extracte Oyls of Spices, Seeds, and Flowers. But if you would rectifie either Oyl of Amber, Jet, Wax or any of thole heavy and fatty Oyls which must be urged up with a strong fire, then your best way is to pour the Oyl upon a good quantity of Rose-water in a glasse body, luting a helm unto it, and so by rectifying the same often from Rose-water, a great part of that offensive and

and adust smell, which they purchase in their distillation, will be taken away.

107. *Divers special uses of the aforesaid Oyls not heretofore published.*

TO commend them either for their medicinable and known vertues, or for their printed qualities were but lost labour, and therefore I refer all such as be desirous to read them at large, to the plentiful discourse concerning that matter, written by Doctor Gesnerus, in a book intituled, *The Jewel of Health*, and Englished by Mr. Baker. But of those other more rare, and conceited uses, which either I have found out by mine own experience, or learned of others; I will here give some taste unto all the true lovers of learning. And those who are desirous to make a trial of these practises, may repair to Master Demish, that ancient and expert Chimist dwelling near the Glas-house, at whose hands they may buy any of the aforesaid Oyls in a most reasonable manner.

108. *Divers sorts of sweet or hand waters made suddenly, or ex tempore with the said Oyls.*

First you shall understand that whensoever you draw any of the aforesaid oils of cinamon, cloves, mace, nutmegs, or such like, that you shall have also a pottle, or a gallon, more or lesse, according to the quantity which you draw, of excellent sweet washing water for your table, yea some do keep the same for their broths wherein otherwise they should use some of the same kind of spice; but if you take

three, or four drops of the same onely of the Oyl of Cloves, Mace or Nutmegs, (for Cinamon Oyl is too costly to spend this way) and mingle the same with a pint of fair water, making agitation of them together a pretty while in a glasse having a narrow mouth till they have in some measure incorporated themselves together: you shall find a very pleasing and delightful water thereof to wash with, and so you may alwaies furnish your self of sweet water of several kinds, before such time as your guests shall be ready to sit down. I speak not here of the oil of Spike which will extend very far this way, both because every man likes not so strong scent, and for that the same is elsewhere already commended by another Author. Yet this I must needs acknowledge to be the cheaper way, for that I assure my self there may be five, or six gallons of sweet water made with one ounce of the Oil which you may buy ordinarily for a groat at the most.

This way you may also make an excellent sweet water for a casting bottle. Take three drams of Oyl of Spike, 1 dram of Oyl of Time, 1 dram of Oil of Lemmons, 1 dram of Oil of Cloves, then take 1 grain of Civet, and 3 grains of the aforesaid composition well wrought together, temper them wel in a silver spoon with your finger, then put the same into a silver bowl, washing it out by little and little, into the bowl with a little rose-water at once, till all the Oyl be washed out of the spoon into the bowl, and then do the like by washing the same out of the bowl with a little rose water at once, till all the scent be gotten out, putting the rose-water still in a glasse when you have tempered the same in the bowl sufficiently. A pint of rose-water will be sufficient to mingle with the
the

the said proportion; and if you find the same not strong enough of the civer, then you may to every pint put 1 grain and a halt, or 2 grains of civer, to the weight of 3 grains of the aforesaid composition of oils. If you distil bruised cloves with fair water onely in an ordinary leaden still, you shall receive very good washing water for your table; and the charge thereof will not exceed 3 pence, or 4 pence the pint. All these several sweet waters I have often proved.

109. *How to make sundry sorts of most dainty Butter with the said Oyls.*

IN the moneth of May it is very usual with us to eat some of the smallest and youngest sage leaves with Butter in a morning; and I think the common use therof doth sufficiently commend the same to be wholsome; instead whereof all those which delight in this herb, may cause a few drops of the oyl of sage to be well wrought or tempered with the Butter when it is new taken out of the churn, until they find the same strong enough in taste to their own liking: and this way I account much more wholsome then the first, whetein you shal find a far more lively and penetrative tast, then can be presently had out of the green herb.

This last Summer I did entertain divers of my friends with this kind of butter amongst other countrey dishes, as also with Cinamon, Mace, and Clove butter (which are all made in one self same manner) and I knew not whether I did more please them with this new found dish, or offend them by denying the secret unto them, who thought it very strange to find the natural tast of herbs and spices conveyed into

butter, without any apparent touch of colour. But I hope I have at this time satisfied their longings. *Qre.* if by some means or other you may not give a tincture to your cream before you chern it, either with rose leaves, cowslip leaves, violet or marigold leaves, &c. and thereby change the colour of your butter. And it may be if you wash your butter thoroughly wel with rose-water before you dish it, and work up some fine sugar in it, that the country people wil go near to rob all Cocknies of their break-fasts, unlesse the dairy be wel looked unto. If you would keep butter sweet and fresh a long time to make sops, broth or caudel, or to butter any kind of fish withal in a better sort then I have seen in the best houses where I have come, then dissolve your butter in a cleane glazed, or silver vessel, and in a Pan or Kettle of water, with a slow and gentle fire, and pour the same so dissolved, into a bason that hath some fair Water therein, and when it is cold, take away the foot, not suffering any of the curds or whey to remain in the bottome: and if you regard not the charge thereof, you may either the first or second time, dissolve your butter in Rose water as before, working them well together, and clarifie it, and this butter so clarified, will be as sweet in taste, as the marrow of any beast, by reason of the great impurity that is removed in this manner of handling: for I think that if you clarifie it thoroughly well, you shall find either a fourth or a fifth part of dross, in the best butter that you can buy in the market, which I think to be more fit for the dung-hill, then for a mans stomack, onely it helps the butter wives to make some weight: as though (simple wenches) they knew not which way to help themselves in their small dishes. *Qre.* What butter

butter the cream of Goats milk will make, because the milk is exceeding sweet and nourishing. You may easily know what countrey man I am, by following this London text so far as I do : neverthelesse, let me teach one thing more to them that know it not already, and so I will conclude with butter. That in the winter time it is very requisit to scald your milk presently as it comes from the Cow, before you put it into your pans, but take heed it seeth not, and you shall have very good butter, curds and cheese, when others shall want the same. And thus I hope, I have given some content to those Gentlewomen, which do not think themselves too old, or too wise to learn ; and if there be any that can say more in the circumstances of Butter, I hope there Dairies be greater then mine, that never kept but two kine in any one Summer.

110. *To make any cheese taste of the aforesaid Oyls.*

AS before in butter, so likewise if you mingle any of the aforesaid Oils in your curds, before you press out the whey, you shall feel the same very sensibly and pleasantly, in the tast of your cheese; in the which you may easily mingle some rose leaves, or give them the tast, smell, and color of any flower, at your pleasure. There is also a trick in the making of a cheese, without putting the same into any press, onely by giving the same a gentle peize, whereby the whey that runs from the curds will be as thin as water, and carry no substance with it, and so your cheese will be much bigger and better then otherwise it would be, being made after the common countrey fashion. I have been as bold as I dare, in discovery

hereof, because I would be loath to offend a Gentlewoman that presumes of a great secret herein, and she is the more dainty of her skill, because she hath found it out by many labours, and losses of her own. But I think I have given a sufficient light to a good Dairy Woman, to find out all the circumstances thereof in time.

111. *Wholsome and comfortable Manus Christi, for such as have weak stomacks.*

Dissolve some of the whitest Barbary sugar you can get, with a little rose-water in a small shallow pipkin that contains 3 or 4 ounces, and glased within, and having a small lip, boil the same upon a soft fire, unto a stiffness, or consistency (as they term it) till a drop thereof being poured out of the lip upon a cold stone, become hard, and not clammy when it is cold. And when you have your sugar boiled to this height, then having a clean marble stone, first sprinkled over with fine flower, pour the same out by peccemeal, making each of them of the bigness of a groat or tester, or thereabouts: and when they are thorow cold, having a few drops of the oyl of Cinnamon, Cloves, Mace, Nutmegs, &c. in a silver spoon, with a small feather give each of the *Manus Christi* a touch onely with a little oyl on the tip of the feather, and so you may prepare a great many together of them with such oyles as the Physitian shal give direction, and in the earing of them you shal find them to warm and comfort your stomack exceedingly. Some put in their oyles in the boyling of the sirrop; but I hold the first to be the better way, both because you may make of several sorts at once; as also for that

these oyls being over heated, do lose a great part of their grace in tast.

112. *Divers kinds of excellent bottle Ale to be made with the aforesaid Oyls.*

I Cannot remember that ever I did drink the like Sage Ale at any time, as that which is made by mingling 2 or 3 drops of good oyl of sage, with a quart of Ale, the same being well brewed out of one pot into another. And this way a whole stand of sage Ale is speedily made. The like is to be done with the oyl of Mace or Nutmegs. But if you wil make a right Gossips cup, that shall far exceed all the Ale that ever mother *Bunch* made in her life time, then in the botling up of your best Ale, run halt a pint of white Ypocras that is newly made after the best receit, and with good spice, with a pottle of ale; stop your bottle close, and drink when it is stale. I fear some Ale wives, if they had known this receit, privately to themselves, would have hung out holli-bushes at their red lettises, and so they might have been mistaken for Taverns, of many Ale Knights. Some commend the hanging of a roasted Orenge prickt full of Cloves, in the vessel of ale, till you find the tast thereof sufficiently mended to your own liking.

113. *Wormwood wine made very speedily and in great quantity.*

TAke smal Rochel, or Conniack wine, put a few drops of the extracted oil of wormwood therein, brew it (as before is set down in the bottle ale) out
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of one pot into another, and you shall have a more neat and wholsom wine for your body, then that wine which is sold at the Stilyard for right Wormwood wine. And as for their Rhenish wine, I have heard them speak it, whom I dare beleeve, that how many fatts soever be found at once in some of their cellars, there is none worth the tasting, but that onely which is abroach, and this is a pretty flight to deceive the Purveyor. It may be the rest of the fatts, have not yet received either the brimstone match, or the compound scent which they pour in with it, or the hearb *Gallitricum*, which I have heard greatly commended that way; but howsoever they sophisticate this wine, I am verily perswaded, by that little acquaintance which I have had with the grapy God, that for the most part, these Dutch Brewers, buy no other wines but *Rochel* or *Coniack*, after 14 or 16 pounds the tun, and with some five or six shillings charge upon a fat, they draw it again for Rhenish wine, after 32 l. the tun. I will not touch here the setting of new Perry instead of Rhenish wine in the must, or both together in equall proportion, because I fear I have already vexed the Vintners, who find more profit in their secret mixtures, then pleasure in these open discoveries.

114. *How to sweeten the Oyl of Almonds with the aforesaid Oils, so as the same may serve the Perfumer instead of the Oil of Benn, which is made of the Italian nuts.*

CHuse the newest and sweetest Almonds, that you can get (you shal know them by their reddish colours, and I hold the Barbary Almond, far better

better then the Jordan Almond for this purpose) express their oil according to the manner hereafter set down, without warming either the Almonds or the brasen box wherein you put them, lest they become rank in a short time. After you have drawn some quantity hereof, let it settle four or five days, till all the *Feces* or grounds fall to the bottome; then by declination pour away the clearest, & take a little thereof, and mingle a few drops of the oil of cloves therewith, stirring them well together in an apt glass, then pour more of the oyl of almonds thereto, working as before, incorporating so much of the oyl of cloves therewith, till the scent thereof like you. With this oyl thus prepared, the perfumer may temper his musk, civet, or amber-greece, as he doth with his oyl of Benn, which serves for no other purpose, but onely to convey such scents & perfumes into the leather as he hath wrought together for the self same purpose, being it self of no scent at all. This I write, not upon bare imagination, but upon some proof which I have seen made with the simple oyl of Almonds in gloves of no small price. Although I know this oyl to be greatly doubted of by the Perfumers, because in a few moneths it wil grow somewhat rank, whereas the fault is in the old Almonds which the Apothecaries do chiefly use, because they are more oily then those which are new and fresh.

And here if a man were disposed (*Seria miscere joci*) were a fit opportunity to discourse of a Philosophical contrition of oyls, thereby to defend them from putrifaction. Also if you labour and beat well together some fresh oyl of Almonds with change of rose water, it will serve instead of sweet oyntment, or *Ematum* to anoint your hands with. So likewise

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of the oyl of Cloves, tempered with the oyl of Almonds to rub a new glove in the inside, to give it a sweet sent in the wearing. Here I could commend the oyl of Beech-mast, if it were in yeeld according to the report of a Neapolitan writer; for that which is expressed from the nut I know to be a most sweet and delicate oyl.

I could here set down an experienced tryal for the alteration of tallow candles, whereby to make them in a manner as sweet in handling, burning, and putting out as the wax candle, yet not altogether so hard; the principal part of which secret consisteth in an artificial composition of some of the aforesaid oyls. But I must reserve the same till another Edition, which I wil hasten according as I find a thankfull acceptance of the first.

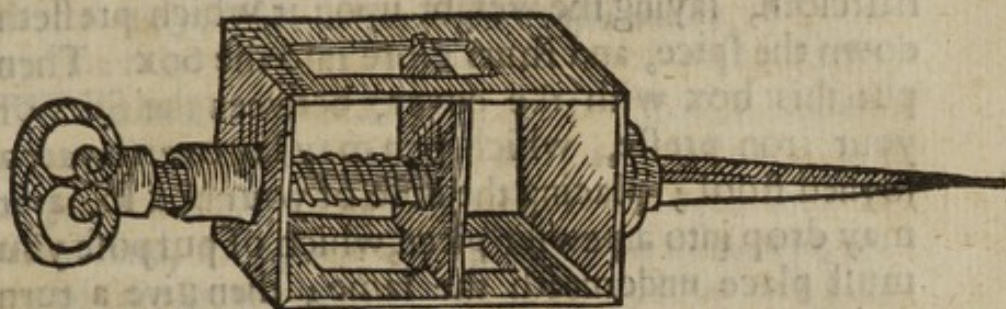
115. *How to draw oyl of Wax, Amber, Jet, Turpentine, &c.*

I Have here advisedly omitted to set down at large the drawing of the oyl of Wax, Amber, Jet, Turpentine, &c. because most of them are offensive in smell. Yet let this in a word or two suffice, that all of them (except the oyl of Turpentine) are to be drawn in sand, and most aptly by way of retort, which some do also use to lute over with lome and flocks well tempered together: and because those unctuous and swelling bodies shall not rise up into the helm, they use to suppress them by the addition of clean washed sand, powder of glasse, tilestones, and such like. And as for the oyl of Turpentine, it wil rise by a gentle Balneo, in a Cucurbite of glasse or stone, having a helm of glasse luted thereunto. Q^{ue}. If it wil

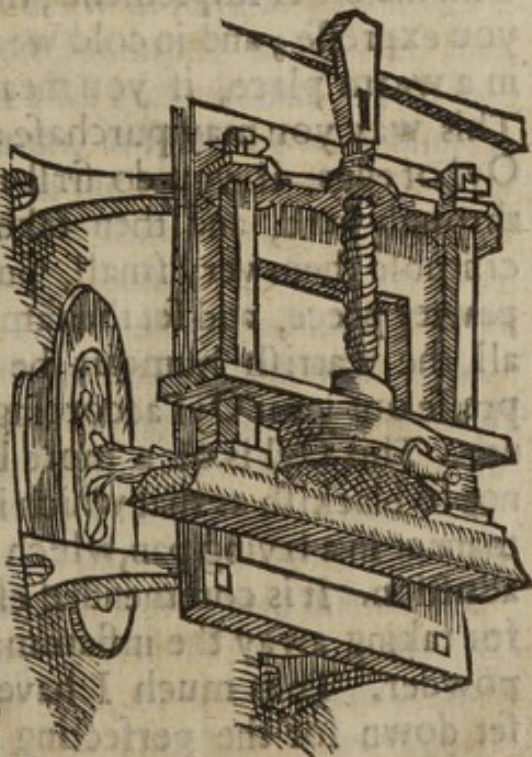
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not rise from water out of a brasse pot, according to the manner of the oyls of herbs and spices, before set down.

116. Of expressed Oyls.



Of all the aforesaid seeds and spices, as there may be an oyl drawn by ascension, so likewise there may be an oyl had by expression; yea, many simples will yeeld their oyl by expression, which will yeeld none at all by ascension; but as you shall have much more quantity of Oyl this way, either from the Nutmegs, Cloves, Mace, &c. so the same is much grosser then the other, and more fit for outward applications then inward medicines; nevertheless they carry a strong and full scent of the aromaticall body, from whence they are drawn, and



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have also their especial uses. The manner whereof is this. Beat your spice or seeds thoroughly well in a stone mortar, and thrust them close into a peece of haircloth, or French boulder, (which before hand you must place in your mettaline box, that hath a little close iron grate in the bottome) then lap up the haircloth, laying the weight upon it, which presseth down the spice, and shuts close into the box. Then put this box with the cover, between the sides of your iron presse, which you may lay overthwart a joyned stool; placing the nose of your box so, as it may drop into a pewter peece, which of purpose you must place underneath the same; then give a turn now and then with an iron pin to the screw, till you see no more Oyl to issue, (some to gain the more Oyl, infuse the spices in the Oyl of sweet Almonds first.) Note that your seeds and spices, and the box with the other implements, must be warmed before you expresse; and in cold weather it is best working in a warm place, if you mean to have store of Oyl. This way you may purchase a most excellent sweet Oyl of eggs, if you do first roast them till they be through hard, and then take the yolks onely, and crumble them very small, putting them into a little pewter peece, and set the same in a hot Balneo, till all the watrish humour be evaporated, and then presse out your Oyl according to the aforesaid manner. This Oyl is of a more beautifull colour, and not so blackish as that which is made after the grosse manner in a frying pan, which smelleth and tasteth of adustion. It is commended especially in a burn, and for taking away the inflammation and heat of Gunpowder. Thus much I have thought convenient to set down for the perfecting of this branch of the Spagi-

Spagirical Art. And now I will proceed to some other necessary knowledge in the art of distillation, concerning such matters as I am assured that every Gentlewoman that delights in chymical practises, will be willing to learn.

117. *How to make Cinamon water.*

THe best way is first in a brass pot with a pewter Limbeck, to distill from 2 or 3 gallons of sack, or muscadel, so much spirit of *Aqua vite* as will ascend, then pour that spirit upon as many gallons of fair water, putting to every gallon of water and spirit, a pound of choice Cinamon first bruised; lute the joints of your pot and Limbeck, as before in the extraction of the Aromatical oyls, keeping the bucket in the head of the Limbeck cold, with change of water, and so draw as long as you find any reasonable taste of the Cinamon. This of all the ordinary ways is the best that I know. But if you infuse your bruised Cinamon, in spirit of wine onely, or in the spirit drawn from sack lees, or strong ale, untill you have gotten out by imbibition, all the tincture, tast, and strength of the Cinamon, which will be in seven or eight days, and then if you adde a new proportion of fair water, or rather of damask rose-water unto it, and so distil in a glass body and head in Balneo, well luted in the joints, I think you will find this the most profitable, and most artificial way of all others. And lest you happen to be deceived in the strength of your cinamon water, you must tast every stick of cinamon by it self, before you buy it, yea and the same at either end, or else you may happen to be deceived. If when you have drawn your

Cynamon water, you like not to have it of a thick or cloudy colour, as commonly it falls out in this manner of distillation: some hold opinion, that it will become clear, onely by sunning it in an hot sunny day or two; and some use to circulate the same in Balneo till it clarifie. But I have found it an intallible way, to have the same clear at the first drawing, by distilling the same in a Copper Balneo, with a Lamp onely, or so gentle a heat as may not be idle, and yet procure but a soft and easie distillation. And I think this was Doctor *Burcots* way, who thought himself very cunning in the distilling thereof, because there was not much clear Cinamon water to be had in his days.

118. *How to make the extraction of all Herbs.*

SOME are so curious in this work, as that no other water, but the distilled water of the herb onely, wil satisfie their fancy herein, although I see no great difference between the same, and an ordinary water first distilled and divided from his impurities: but let the Chymist, now he knoweth them both, take which he list, for I do rest indifferent, saving that I find it an infinite matter to distil so much water as will be requisite for the gathering of any quantity of this substance, or tincture as some term it. But with whether of them soever you begin, you must proceed in this manner. After you have macerated great store of the Herb in several waters, until such time as you find each water deeply died, or tinged with the colour of the Herb; then having a large Balneo, wherein you may place divers bodies of glasse at once, you must evaporate all the water until in the
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end you leave nothing else but a stiff and dry substance, which our Chymists call the extraction of the Herb. Some chuse rather to work upon the dry herb then the moist, & *alij è contra*. But if you work upon the distilled water of the herb, as upon the Rose, Balm, Bugloss, *Carduus Benedictus*, or any such other Water of good use or account, then it is not amiss to lute or set your heads of glals also upon the bodies, with receivers, thereby to receive the water that ascends, so as there may be no losse of your distilled waters, and yet also you may attain to that second water which you expect. This extraction I have heard highly commended by many Artists, and it may be it hath some better uses in Physick then I know or can imagine. But if I shall deliver my opinion thereof, I think it to be the fine and subtile earth of the herb or flower, out of the which some curious Limner may draw some excellent colour for his work, if he make choise of the flower de Luce, white Rose, blew Bottle, Marigold, or some such other Flower as is of any deep tincture: but I perswade my self, that no Philosophical Vulcanist, or perfect Paracelsian, will ever find any true magistery, tincture, quintessence, or *Arcanum* therein.

119. *How to make Salt of Herbs.*

BVrn whole bundles of dried Rosemary, Sage, Hyssop, &c. in a clean oven, and when you have gathered good store of the ashes of the herb, intuse warm water upon them; and make a strong & sharp Lee of those ashes; then evaporate that Lee, and the residue or settling which you find in the bottome thereof, is the salt you seek for. This salt, according

to the nature of the herb, hath his operation or use in Physick, and in my conceit doth work greater effects in the stomack then any of the aforesaid extractions. Some use to filter this Lee divers times, that their salt may be the clearer, and more transparent. But because the word *Filter* is a word of Art, and not understood by all, let me tell so many as know not already, that it signifies, The making up of a brown paper in the nature of a funnel, then pour in your Liquor and let it run through at its leisure.

120. *How to draw and rectifie a Spirit of wine in divers manners, as well wth fire as without fire.*

IF you would dispatch any great quantity thereof, you must have a large Balneo, which is no more then to place your glasse body, which holds the matter to be distilled, in a convenient vessel of water, when the water is cold (for fear of breaking) and put a wisp of straw or Hay in the bottome under it, and make the water boil in a vessel wherein you may place six or eight glasse bodies at once, with their helms and receivers, each of them fastned to a leaden triver, that they may stand steady in the water, wherein you may put some Hay if you please, pour into each of them a reasonable quantity of the oldest and mightiest Sack, Malmsey, or Muscadell, because these wines are strongest, and yeeld most spirit. Your fire must be soft and gentle, so as you may tell eight or ten between every drop that falls. Draw no longer then till you may perceive long veins in the helms, for if they once grow dewy, or stand full of drops, then you may assure your self, that all the spirit is gone, and the flegmatick part of the wine ascends :
yet

yet there be divers, and those of good judgement, who do most constantly affirm, that before the veins appear in the helm, the subtillest spirit of all doth arise in a dry and insensible fume, which condensating by the coldness of the air, doth resolve into drops in the receiver. Some do use at the first pint always to change the receiver, and so divide that which comes first by it self from the rest, putting all the faint spirit together, and then rectifie them severally in the like bodies and helms by a second distillation, in the aforesaid Balneo; and they never leave to reiterate their distillations, until by making tryal of a little thereof in a spoon, they find the same being kindled to burn all away. Some fasten a sponge in the mouth of the glass body, and some cover the mouth of the glass with an oiled paper, and so perswade themselves, that nothing but perfect spirit will penetrate either the sponge or paper, and some put the crum of a white loaf in the bottom of the glass, thinking thereby to suck and drink up all the faint part of the spirit. But I have found by my own experience, that after there is once drawn a pint, or a pint and a half of spirit, from a gallon of good wine, if the same be put into a large bolt receiver as they term it (which



is a glass having a long sharp steale of the bignesse of a musket, or double musket bore, with a great round hollow ball in the bottom containing some pottle, or gallon, or two or three, if you can get them so large (for the greater in content the better for this purpose) this bolt glass must be well fastened to a leaden trivet in Balneo, and then if the spirit that is so grossely drawn, be put therein, setting a small helm of glass that

that may fit the steal, with a receiver at it, then the pure spirit onely will ascend, and the flegmatick part not being able to mount so high, falls down again to the bottome as fast as it riseth, and so at once rectifying, you shal have your spirit perfect enough. Others thinking to attain to a quintessence, or at least to an oyl of wine, that will fleet and swim upon any other wine; they begin with a long circulation of the wine, first either in a Pellican, or other large circling glasse, placing the same either in horse-dung, or in a Balneo, or some other such like digesting heat, by the space either of a moneth, or two or three, every one according to his fancy, and then they fall to their division or distillation by a soft fire, keeping that by it self which comes first, as a most rare and excellent Spirit. And all this while, if I be not deceived, we have gotten nothing else but the fiery part of the wine, or rather the burning *Aqua vita* both of the Wine and Tartar together, that are urged up by fire to knit themselves both spiritually and inseparably together. Then let us see if any truer division may be made without this Balneo, or any other outward heat what soever: nay, let us consider what may be done in a frosty furnace, where the Northern winds must stir up nature instead of glowing coals. Here I am afraid either my Wit or my Wil wil soon be frozen up; nevertheless, since I am entred so far, I wil either break the Ice, or venture a fall; and if I slip, you shall see how I will frostnail my self the next time that I ride abroad in such hard weather. I dare not here commend that new conceived way of rowling up and down a large vessel of wine many hours together, or after the same hath wrought upon the seas, so soon as it commeth to shore, presently to clap on a glasse helm

helm upon the bung-hole being open, and luting the same close to the Cask, to receive that spirit which nature in her heat will suddenly breath out : and yet I will not altogether condemn the invention, if such a workman have it in hand as is able to bring the stomack of wine into a kindly sweat. But suppose this to be a right and natural distillation, though it be temperately performed, and without any forreign fire, it is not that extream cold and congealed work that was promised. But what if I should send you into Frizeland, or Russia, or Muscovia, or into some other place near unto the Northern pole, and there wil you after *Paracelsus* his manner, to lay abroad into the open air, either a But of Sack or Muscadel, til the same were congealed into a hard masse or lump of Ice, and then piercing the vessel even to the center, with some apt instrument of Iron, to pour out that inward life or spirit which had retired or withdrawn it self from the outward cold, into the warm fort or castle of nature ? I am afraid you would rather forswear the trial, then take so long a journey in hand. Then let us see what may be done in this kind in our own Countrey, though not in so great a quantity. I have found by those few trials which I have made in London, that if in an extream and sharp weather in the winter time, a glasse of wine containing a pint, or half a pint in measure, and being well stopped with Cork and Brimstone, or some other strong lute, be exposed to the air on the top of some high leads, that the same will oftentimes congeal and freeze in one night within the glasse, so as there will not remain above a moyety, yea many times a third part onely of the wine unfrozen, which you shall find so deep of hue and colour, and so mighty in strength and tast, as

that the best Gascoign wine that comes from Burdeaux wil seem but Rochel wine in comparison thereof. Here we have an entrance made into nature, and since we have gotten such hold, let us gather in more upon her. Peradventure if the glassees were as thin as any vial, smal in content, round, and of an orbicular form, rising up with small long necks, and the same were placed Northerly either in snow, or water, or rather in water wherein some store of Salt-peter hath been first dissolved, to make the water more inwardly cold; or peradventure if before the stopping of your glasse you did dissolve some reasonable proportion of snow water into your wine, that either some one of these helps, or all together might work a perfect congelation of the faint and flegmatick part of the wine, and so you might attain to your desire. But without all peradventure, there may be (by some means that are known but to a few) such an outward continued cold maintained round about the glasse, as that in any reasonable cold weather the spirit may be forced to fly inwardly for succour into his own bosome, and being once driven into this streight, I account him but a simple Chymist that cannot fetch him out, and divide him from the rest of his grosse body. Prove the freezing of Ale or Beer, or of the smallest kind of wine, for they are likeliest to freeze, because they contain but smal store of spirit in them. Although I have seen even Sack it self gather a thin icie crust in one nights freezing.

121. *To make Claret Wine to mount up in a red Cloude in a Glasse of Conduit.*
Water,

Cause

CAuse a glafs to be made of the fafhion of thofe which are commonly ufed in hour glaffes, but of fome greater content, and with a leffe lip, fill the fame full of fair water, and whelm it upon the mouth (which becaufe it is fmall, and wants air, no drop will iffue thereat) then put it into a Beer glafs of the form here defcribed, being almoft full of Claret Wine; and if you hold the fame wifely, and that the Glaffes fit one another, you fhall fee the Claret wine afcend in the form of a Cloud, and that which remaineth in the neather Glafs to be exceeding faint both in tafte and colour. If either the tincture alone, or the fpirit of Wine did here afcend, & fo incorporate it felf with the water, I would hold it for a rare fecret, and a light into fome further matter; but I fear you will find nothing elfe therein; but that when two bodies touch each other, that the wine being the lighter feeks the upper place. And yet I muft needs commend the invention of that honeft and learned Gentleman from whom I had it, and no doubt before the difcovery thereof, it would have been thought an admirable conceit, to have made two feveral glaffes to have exchanged their liquors, without any other means.



123. *To extract the Spirit of any Vegetable, or Herb.*

First dry your Herb, then put it into Balneo, and let it infuse eight hours, or one whole night; Then take the liquor and the substance that was infused in

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Balneo,

Balneo, and distil it in *Alembico*, and when you perceive a gum to remain, and hath a full tincture of the herb, take the top of that gum, and infuse it in the liquor you have distilled in Balneo, then filter it through a paper, then distil it again in Balneo, and you shall have the true spirit of the herb or vegetable. This was delivered me by the son and heir of a Nobleman, who received it of one of the greatest practisers of my time; and if it answer the title, I am glad that it was my good hap to light upon it.

124. *How to give a pretty grace both in tast and property to the spirit of wine.*

IF you infuse the same upon the rind of a civil sour Orange or Limon, you shall find a pleasant and comfortable taste thereby: or if you would not have the same descried by his colour, you may redistil the spirit so tinted in Balneo. Some give a touch unto the spirit of wine with Rosemary, some with Anni-seeds, some with sweet Fennel-seeds, some with one seed or herb, and some with another, by infusing the same a day or two upon them.

125. *How to draw the Spirit of Honey.*

AFTER you have dissolved sufficient store of honey in fair water, to make a good Metheglin, and that the same hath wrought a reasonable time, by the addition of yeast, according to the manner of Beer and Ale; then when the same is grown unto a strong and mighty drink by lying, you may draw a spirit from it by distillation, as you do either from Wine, Ale, or Beer.

126. *How*

126. *How to distil Rose-water, both good cheap, and at Michaelmasse, and to have as good yeeld as at any other time of the year.*

IN the pulling of your Roses, first divide al the blasted leaves, then take the other fresh leaves, and lay them all abroad upon your Table or Windows, with some clean linnen under them. Let them lie three or four hours, or half a day ; but if they be gathered in dew, then lay them abroad as before, till all the dew be vanished and gone from them : put these Rose-leaves into great stone pots that be leaded within, and well dryed, (such as the Gold-finers call their Hoonkers, and serve to receive their *Aqua fortis*, be the best of all others that I know.) and when they are well filled, stop their mouths with good corks all covered over with melted Brimstone, and then set your pots in some cool place, and they will keep a long time good, and you may distil them at your best leisure. This way you may distil Rose water good cheap, if buying store of Roses when you find a glut of them in the market, whereby they are sold for seven pence or eight pence the bushel, you put them up as before. And some hold opinion, that if in the midst of these leaves you put some leaven, and after fill up the pot with Rose-leaves to the top, that so you shall have a Rose-vinegar from the Rose in your distillation, without the addition of any vinegar at all. You may also keep them in glasses, and I have known them kept in little rundlets, that have been first well seasoned with some hot liquor and Rose-leaves boiled together, and the same pitched all over on the outside, so as no air might penetrate the vessel. *Qre.* If
any

any spirit will ascend, if you make separation of that which riseth from the Rose-leaves kept as before,

Some for the more expedition in Rose-water, do first expresse their juyce, and then distil it; and afterward they do also distil the expresseed leaves, and so they dispatch more with one Still then others do with three or four. I have seen very good Rose-water drawn this way, but yet I take the ordinary way to be more kindly, especially if the head of your still be made like a Limbeck, with a large bucket to hold store of cold water. And some commend the distillation of the Rose, Violet, Couflip, &c. that is performed by the deicensory, having also a cooler of cold water about it, which at a certain cock you may empty as it heats from time to time, and fill with fresh water again.

127. How to dry rose-leaves, or any other single flowers in such shape as they grow, without any wrinkles, so as a bushel of moist leaves shall become a bushel in measure when they be dry; and how to keep Rose cakes and and Rose leaves all the year without worms.

IF you would perform the same in rose-leaves, you must in Rose time make choice of such Roses as are neither in the bud, nor full blown, (for these have the smoothest leaves of all other,) which you must especially cull and chuse from the rest. Then take of right Callis sand, and wash the same in some change of waters, and dry it thoroughly well either in an oven, or in the sun; and having shallow, square, or long boxes, of four, or five, or six inches deep, make first an even lay of sand in the bottome, upon the which lay your rose-leaves one by one (so as no one
of

of them touch another) till you have covered all the sand: then with a spoon, or with your hand, strew sand upon these leaves till you have thinly covered them all, and then make another lay of rose-leaves upon the sand, and so make *stratum super stratum* for four or five lays one upon another. Set this box abroad in some warm place, in a hot sunny day (and commonly in two hot days they will be thoroughly dry) then with your hand or a spoon, you must strive gently to get underneath them, and so to lift them up without breaking. Keep these leaves in jar glasses bound about with paper, or parchment, in some cupboard that is near a chimney, or stove, lest otherwise by the damp of the air they relent again, and so you lose your labour. I find the red rose-leaf best for this purpose, by reason of his deep colour. You may also dry Paunfies, Stock-gilliflowers, and other single flowers, such as will hold their colour best, in this manner, by taking away the stalks, and pricking them one by one into the sand, and so pressing their leaves smooth with the other sand, which you must lay upon them. And so you may have rose-leaves and other flowers to lay about your basons, windows, and court cupboards all the winter long. Also this skil is very requisite for a good simplifier, because he may dry the leaf of any hearb, in this manner, and lay it being dry in his herball, with the simple which it representeth, whereby he may easily learn to know the names of all simples which he desireth. The ordinary drying of Rose-leaves, is to lay them upon hot leads, in a hot sunny day, and the sooner you dispatch, the better they will keep their colour, and scent. And when you have dried them thoroughly, you may fill a Rose-water glasse there-

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with

with, stopping it close, and so they will last good a long time.

The powder of Rose-leaves, and so also of all other hearbs and flowers, may be kept from all outward accidents for one years space, if there be any reasonable care used therein.

If you would keep your Rose-cakes without worms, you must now and then, when you have drawn your bread out of the oven, set them in, in sieves, or upon papers, and so of your rose-leaves; and if you hang them up in paper bags, near some chimney where fire is sometimes made, you shall be sure to keep them sweet and good, for any use for which they will serve, although I know divers that keep their rose-leaves onely according to the manner before set down.

128. Rose-water, and Rose-vinegar, of the colour of the Rose, and so of the Cowslip, and Violet-vinegar.

SOME infuse rose-water upon moist red rose-leaves, and so set it abroad on sunning for a few days, but this colour cannot last long, but if you would make your rose-water, and rose-vinegar of a perfect ruby colour, then make choise of the crimson velvet coloured leaves, clipping away the whites with a pair of sheers, and being through dry put a good large handfull of them into a pint of damask, or red rose-water, stop your glasse well, and set it in the sun till you see that the leaves have lost their colour; or for more expedition you may perform this work in balneo in a few hours, and when you take out the old leaves put in fresh, till you find the colour to please you; keep this rose-water in glasses
very

very wel stoppt, and the fuller the better. What I have said of rose-water the same may be intended of rose-vinegar, violet, marigold, and cowslip vinegar, but the whiter the vinegar you chuse for this purpose, you shal have it the better colored, & therefore the distilled vinegar is the best of all other, so as the same be warily distill'd with a true division of the parts made according as hereafter is set down, but some do highly commend such vinegar as is made of elder flowers, choicely pickt, and wel dryed before imbibition.

129. How to distil wine vinegar, or good Aliger, that it may be both clear, and sharp for sauce, or other uses.

I Know it is a usual manner among the novices of our time, to put a quart or two of good vinegar, into an ordinary leaden still, and so distil it as they do all other waters. But this way I do utterly dislike, both for that here is no separation made at all, & also because I fear the vinegar dosh carry an ill touch with it either from the leaden bottome, or pewter head, or both. And therefore I could wish rather the same were distilled in a large body of glass, with a head or receiver, the same being placed in sand or ashes. And note, that the best part of the vinegar is the middle part that ariseth, for the first is faint and flegmatick, and the last will tast of adustion, because it grows heavy towards the latter end, and must be urged up with a good fire, and therefore you must now and then tast of that which comes both in the beginning, and towards the latter end, that you may reserve the best by it self. Here I could also advise, or wish all Ladies and Gentlewomen, to have all their vinegar served in at their tables in sawcers of glasse,

or Purslain, because if it be strong, and continue long in a pewter sawcer, it hath an intention towards ceruse, which I could never hear commended, either for wholsome meat, or sawce for a mans stomack. But it may be this is but one Doctors opinion, and that of such a one as never deserved his degree in schools, and therefore I will leave the same at large until some better Clark do hereafter confirm this green conceit. Here I cannot omit the profitable observation of one of our London Chimists, who after he had drawn good spirit of wine from muskadel, did by sunning of the same also make good vinegar, of the facical part thereof.

130. How to keep the juyce of Orenge and Limons all the year, for sawce, Iuleps, and other purposes.

I Know no reason why the juyce of the Limon, or Orenge should not keep as well in small wooden vessels, as either verjuyce, Cider or Perry, and it may be the want of trial hath only proceeded of the charge that would arise in filling of a smal vessel only with such liquor. But how then have we forgotten to provide our store in glasses, which we may fill with a small charge, when Orenge are to be had for 12 d. or 16 pence the hundred? Let us then express their juyce, and pass it through an Ypocras bag, to the end it may be the better clarified from all his impurities: with this juyce fill up a rose-water glasse (of what content you please) within an inch of tul, cover the same with a loose cap of leather, till it have done his boiling, which I have seen continue many days together, and when it becomes still and quiet in the top, then fill up your glasse with good Sallet Oyle, and

and then set it in a cool cloſet, or buttery, wherein no ſun commeth, But the apteſt glaſſes which I can imagine for this purpoſe, were ſtraight upright ones, like to our long beer glaſſes, which I would have to be made of purpoſe at the Glaſſe-houſe, with ſmall round holes within two inches of the bottome, in which holes I would place fit faucets to draw the juyce thereat, as I ſhould have cauſe to ſpend it; and ſo the grounds or lees would ſettle to the bottome, and the Oyl would ſink down with the juyce ſo cloſely, as that no air could enter to begin any putrifaction therein; or inſtead of holes, if there were glaſs-pipes, it were the better, and the readier way, becauſe you ſhall hardly taſten a faucet well in the hole. You may alſo in this manner preſerve many juyces of herbs, that carry ſome ſtore of heat & fire in them, by covering them a reaſonable thicknes with ſallet oil. But there is a better way then this by many degrees (although this be ſufficient for any ordinary uſe) for the long and true preſervation of all juyces, and liquors whatſoever, that have had no digeſtion, or decoction already, wherein neither oil, nor any outward help is required, but onely a true, and Philoſophical rotation, whereby the inward fire of nature may be ſtirred up in every vegetable, to defend it ſelf ſufficiently againſt all putrifying whatſoever. And ſo I have kept both the juice of cowſlips, which (if I be not deceived) will not laſt long by any ordinary courſe of preſerving, and the juyce of Orengeſ ſimply of themſelves without any addition, as ſound and perfect at the years end, as they were the firſt day, or rather (to ſpeak truly) ſomewhat exalted in kind. But becauſe ſuch ſecrets are fitter for a Philoſophers laboratory, then a gentlewomans cloſet, I wil

not here offer that disgrace unto nature; to discover any magistery upon so base an occasion. And as concerning the keeping of Orenge and Limons in the same state, bigness, color, & tast, as they are brought us out of Spain, or Portugal, it may be that in my next labours I will write at large thereof, and in plain terms, according to those undoubted and approved trials, which I have often made in mine own house for many years together.

131. *How to purifie and give an excellent smell and tast unto Sallet Oyl.*

I Have laboured the more to attain unto this secret, because I know that Oyl is a most excellent and wholesome food, and yet my stomach hath alwaies abhorred the same, till of late, that I found the means to take away the fulsom taste thereof. But first of all let us see what Mr. *Bartholomæus Scappius*, the Master Cook of Pope *Pius Quintus*, his privy Kitchin, hath written in this behalf. He willeth to heat the Oil in a clean pipkin, and when it is through hot, to put therein a piece of bread or dough, suffering the same to remain in the oil, by the space of one fifth part of an hour: And this bread or dough will draw unto it self all the musty and bad tast or scent of the Oil, and so the Oyl will remain pure and clean. And in another place he willeth, to take such Oyl as is not rank, or over strong in scent (and if the same Oyl be made of chosen Olives, it is by so much the better then the common sort) and to put the same in a vessel of Earth or Copper, that hath a little hole in the bottome thereof, which you may stop with wax to open at pleasure. In this vessel for every quart of Oyl,

Oyl, add four quarts of fair water, and with a wooden spattle or spoon, beat them well together for a quarter of an hours space, and when you have so done, open the whole in the bottome, and let out the water; for the Oyl doth naturally fleet above, as being the lighter body: and as soon as the water is passed away, stop the hole, and put in other cold water, and begin a new agitation as before, and work in the like manner divers times as you did at the first, till in the end the oyl be wel cleansed and clarified. In the same manner you may also purifie all other sorts of Oyl, as also Capons grease being first melted, but then it should seem you must use warm water instead of cold. Al this is borrowed of the Popes cook. *Qre.* If the Oyl had been beaten the last time in rose-water wherein cloves or nutmegs had been infused before, And for the speedier clarifying thereof (after your aforesaid agitations are past) you may set your Oyl either in a stove, or in the sun till it become clear. A Grocet of good skill did assure me, that by setting of salet Oyl in the sun in the summer time, he had seen the same to settle great store of foul and gross lees, from the which by declination he poured out the clear oyl, and kept it till the next winter, and after the same had been congealed with some frosty weather, he found it the most sweet and delectable oyl that ever he tasted in his life. But an oil-man of some experience told me that if some bruised Nutmegs were hung in a course bag in the midst of the oyl, that in time the same would overcome any bad & lothsome taste that by some accident had infected the Oyl, and give it also a pleasant scent withal; or if you set a jar in Balneo, full of washed oil as before, with some store of bruised cloves, and rinds of civil Oranges

renges or Limons, and so continue your fire, for two or three hours, and then letting the cloves and rinds remain in oil, til both the tast & scent do please you; I think that many men which at this day do loath oil (as I my self did within these few months) will be drawn to a sufficient liking thereof. I do know a means how to make a dejection of the lee or faeces of the best sallet oil, that comes over, whereby the same will become most pure and clear; but I fear that *Saturn* would frown upon me if (without his leave) I should so boldly intermeddle with his charge.

132. *How to dissolve both Coral and Pearl.*

INfuse the juyce of Limons that is clear, and hath settled his residence upon the powder of pearl, & it will dissolve the same, by the experience of a learned Phisitian who hath made proof thereof, and given the same with very good successe in hot burning Feavers. The spirit of Vitriol also, which rises presently after the flegm, and before the oyl, will dissolve both Coral and Pearl, if you set your glasse in warm sand or ashes. *Qre.* Whether the same may be safely taken inwardly, being thus dissolved, or rather fretted in sunder, and without any further ablution: but if you take two ounces of whole seed Pearl, and infuse thereon a quart of distilled vinegar in a parting glafs, or in any other strong glafs of an apt form, you shall in seven or eight days, dissolve them into a soft or slimie substance, which you may after cleanse by ablution, if you think good. And this is done without any fire or outward heat, during which
work,

work, you shall see the pearl rising and falling in the glasse in the manner of a continual hail.

133. *How to clarify without any distillation, as well the white wine, as the Claret wine vinegar, wherewith you may make either gallies or other sauces.*

CHule of the strongest wine vinegar that you can get, and to every six pints, put the whites of two new laid eggs, beat them well together with a wooden spoon, untill the whites be turned into a froth or foam, then put the same into a new leaded or glazed pipkin, and cause the same to boil a little over a fire of coals, but not a flaming fire. Then let the same run through a course white kersey gelly bag, as they use to do gelly: and when it hath run through the same twice or thrice at the most, it will be very clear, and serve for the foresaid purposes, and it will keep good one whole year. And in the same manner, you may fine or clarify any matter whatsoever. But that which you shall gain in the clearness, you shall lose in the strength of your wine.

134. *How to make any decoction whether it be of diet drink or other, in the summer-time, to last longer then otherwise it would without any help.*

IKnow this secret will be very profitable to all the Apothecaries, who in summer time sustain great losse by the sowing, and putrifying of their decoctions, whereof some be also very chargeable unto them, and yet I fear, though I know the conclusion to be true, easie, and not chargeable, that it will scarcely satisfie som of them, which are of a curious humor,

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because

because it is so plain and sleight, and therefore derogatory to their great skills that they should so long time be ignorant in so simple a conclusion. Nevertheless because I know that divers others (if they should dislike) will make use thereof, I think the same very necessary to be published. One day, or two, before you fear the decay of your decoction, let the same on the fire, and give it a walm or two, and so now and then reboil the same a little; and if you doubt the same will become either too thick or too strong by many new decoctions, you may alwaies add so much liquor thereunto, made according to the first receipt, as you think will waft away at every boiling, and then keep the same close, and in a cool place. This may be also performed in another manner without fire, or any other addition, and to last as many moneths, as it will days the other way. But here I must keep *decoram*, and sute grosse matters, with grosse conclusions. It may suffice that I have set down any way for that, which no way was made common before.

135. *How to draw the true spirit of roses, and so of all other herbs and flowers whatsoever.*

Macerate the rose either in water, or in his own juyce, adding thereunto (being temperately warm) a convenient proportion either of yest or ferment, leave them so a few days in fermentation, till they have gotten a strong and heady smel, and beginning to incline towards vinegar. Then distill them in Balneo, in glasse bodies luted to their helms, and draw so long as you find any sent of the rose to come; then redistill, or rectifie the same so often till you have purchased

purchased a perfect spirit. Also if you ferment the juyce of Roses onely, without any leaves mixed therein, you may draw an excellent spirit from the same; or if you keep the juyce of damask roses onely in close vessels wel seasoned with the rose, it wil yeeld a delicate spirit, after it hath wrought it self to a sufficient head, by the inward rotation or circulation of nature: but this work asks a longer time before you can proceed to distillation. The last way, and best way of all other that I know, is, by an outward fire to stir up the moist and inward fire of nature, till the same be grown to the subtilnesse of a rose wine; and when you have once brought it to a wine, then every Apothecary, and ordinary practitioner in this art will easily divide his spirit from him; but they all will stagger in the first digestion; and though they should either reel or fall, I may not lend them my helping hand, otherwise then I have done already, unless I were assured that they were of the number of *Hermes* sons, and not begotten by some base *Alchymist*.

136. *How to draw the true and simple Oyl of Roses.*

DRy 20 or 40 bushels of damask roses according to Art, put them with a sufficient proportion of water (some commend rose-water, others rather the juyce of roses) into a large Copper body, whose head must have a cooler of large content; lute the joynts well, and after a little maceration give a proportional heat unto the body, and with the water the oyl will also ascend, and fall into the receiver. Prove the same manner also with the moist leaf, and if you see any apparent difference either in colour or

thickness between the oyl and the water, then you know how to divide the same easily; but if you can no way discern the oyl, then pour that which you have in your receiver, in a bolt glasse, having a long steale, or into some other glasse that riseth up in a spirring manner, lesse and lesse toward the top: but fill the glasse full, and so peradventure you shall find the oyl, after a little repose, fleeing upon the top like cream, which you must separate with a feather, and keep by it self. This is either a certain, or a very probable way of proceeding. But if I could sell the secret but for ten years purchase, I would pass it with a general warrantize against all objections: In the mean time, let it suffice thee, that I have in this little exceeded my commission.

137. Ypocras made speedily.

TAke of Cinamon half an ounce, white Ginger 3 drams, Cloves & Nutmegs of each half a dram, of the greins of Paradise two scruples, of Pepper one scruple; let them be beaten somewhat grossely, and then macerated in half a pound of spirit of Wine, stopping the vessel close with flowre and water. Let all these ingredients remain six days in infusion, in a cold Wine cellar, stirring them twice a day at the least. a few drops of this composition wil transmute a bowl of Wine into Ypocras. This receipt may be seem the Doctor that first devised it; yet by his favour, I think it requisite, after you have made the Wine thus Aromatical, that you also adde a due proportion of sugar, without the which in these days there is nothing accounted either dainty or delicate, and then you must also pass the same through
an

an Ypocras bag, till it be fine. I think you may also perform the same with Spirit of beer, ale, or wine lees much cheaper.

138. *A touch at Borax Christalinus.*

There is a certain proportion of Borax to be mixed with the *Regulus* of Antimony, which must be chymically calcined together, or burnt in a crucible, or such thing that may endure the fire, until the Borax have glutted himself with the spirits of Antimony. And this is thought to be a safer vomit then either the crude or calcined Antimony, or the *vitram Antimonij*, that is brought to the colour of the Jacinth, because in all these preparations, the body it self of Antimony is retained; but in this preparation you take hold of the spirits onely. This may safely be given in powder, in the pap of an apple, to the quantity of ten, twelve, or fourteen grains: or else the same may be finely ground upon a Marble, and then imbibed with the small proportion of wine, which being drained from the powder, must be taken fasting in the morning, according to the order of other vomits. I cannot here omit that, which I will neither warrant, nor condemn, (although I know to which side I would rather encline before tryal) that infinite extention of the glasse of Antimony, upon which there may be so many several infusions, and all of them of sufficient efficacy to give a vomit; as that by some men of note, and good reputation, it hath been supposed to be a necessary part or member of the Philosophers stone.

139. *How to make Camphire remain liquid in the form of an Oyl.*

First heat a brasse mortar, then beat the Camphire as thin as you can, put thereto by little and little at once, one equal proportion of the oyl of almonds, newly drawn, and incorporate them well together, and it will remain in the form of a clear Oyl, without any congelation. I think the spirit of Wine will dissolve the same, but when you divide the spirit by distillation, the Oyl is likely to congeal in the bottome of your glass.

140. *An artificial extraction of that sweet sirrup of Raisins, Currans, and Pruiues.*

TO every gallon of fair water, put three pound of Maligo raisins, or raisins of the sun, either stamped or unstamped; leave them seven or eight days in infusion, in some little halt tub, having a faucet in the bottome thereof, at the which you may drein out gently all that sweet sirrup which lieth in the bottome, drawing so long as you see any deep colour in the water: then stop the faucet, and put in some more fruit, and divide as before: And having purchased a sufficient quantity of this sweet liquor, boil the same away in an ordinany chafer, or kettle, until it grow unto some thickness, and then for fear of adustion, you may finish the same in Balneo. Expose this in divers apt vessels, and in small quantities to the heat of the sun, against a brick wal upon plates of lead, when the sun is of some reasonable heighth, as in June, July, or August. And if you be carefull

in my direction, you shall have a most rare and delicate Marmelade (if I may so term it) and the same also candied and hardned in a very stiff substance, most naturally tasting of the fruit from whence it is drawn. You may work after the same manner, both in figs and currans, which for more cleanliness, I could wish also to be washed in some change of waters. *Qre.* What an Artist may do in this practise, both in Cherries, Grapes, Damsons, Goose-berries, Barberries, and generally in all English and outlandish fruits and flowers. But then it is requisite to dry some of those fruits sufficiently in the sun, before you make your imbibition, and to roast or parch others with some further heat, dividing the skins, cores and other refuse, before you make your extraction.

141. How to preserve Damsons, Cherries, Pear-plums, Goose berries, &c. in their own juyce or sirrup, without the addition of rose-water.

Lay a convenient number of Plums, Cherries, Gooseberries, &c. in a deep sallet dish, or silver bason one by one, cover the same close with some other dish, and set it upon a chafing dish of coals, beginning with a gentle heat, until the fruit have gathered a great dew or moisture unto themselves; then take of the sweetest Barbary Sugar, and strew the same upon the fruit, being first brought into a most fine powder, (twelve ounces of Sugar is a sufficient proportion for one pound of fruit, but if you please you may allow weight for weight) continue your fire until such time as you shall find that the sirrop hath pierced the stone even to the kernel, for then they are boiled sufficiently; but if the kernel do
winkle

wrinkle or run together, then they are somewhat over-boiled. Also you must not forget to turn them now and then, & to observe all other circumstances as you do use in the ordinary manner of preserving.

142. *The Art of Molding and Casting.*

HAVING finished the Art of Distillation, I come now to shew you the Art of Molding and Casting. First you must labour common loam, a little moistened to a stiffnesse, working the same smooth with a roling pin, as they use to do paste, then make thereof a coffin like unto a pie, saving that you shall need no other bottom but the board or table whereon you work, and that you must fashion your coffin according to the pattern which you mean to cast, for sparing of your pap hereafter mentioned. Fasten well this coffin or sides of loam to your table with your fingers, so as the thin part of your pap may not run out at the bottom, then take a branch of rosemary, time, or hylop; &c. and at the end of the steal fasten a little lump of loam made taper wise, with the small end thereof towards the stalk, and the greater end fasten likewise to the midst of some part of the sides of your coffin in the inside, so as the same may stick fast overthwart wise, and that no part of your branch either touch your table in the bottome, or reach to the uppermost part of the sides, for which cause you must alwaies make your coffin deeper then your branch or flower which you mean to cast, then make your pap in a wooden dish, or stone pan, presently stirring the composition well together, either with your finger for a shift, or some other apt brush or pencil, that there may be a solution or mixture of the

the liquor or powder together. Then pour the same speedily about the sides of your branch; having care that you do not losen the same from the coffin, and be sure that you make pap enough to cover all your branch at once, whereat, by often practise you shall easily guesse. Let the same stand a pretty while. s. about the fourth part of an hour, and the whole composition will harden into a masse or lump, then take away your lome sides from it; which will serve oftentimes, and you have your branches included therein; then with a little stick dig out the piece of lome, which you fastned to the stalk of your branch, but so as you impair not the mold; then lay your branch abroad for a time in some airy or windy place, but not in the sun, and after neal it in a little earthen furnace, making first a foundation of Charcoles, and afterward laying your mold upon them, and then covering your mold with more charcole, and kindling your fire at the uppermost coals, and so continue your fire by adding of fresh charcoles, till you see that the mold be well nealed. s. that it be red hot both within, and without, which you shall perceive by a little hole which the lome made at the end of the stalk, which they call their gitty, if inclining your body you look therein carefully. Then let the fire go out of it self, and suffer the mold to cool; then hath the branch or flower left the impression thereof in the mold, into the which when you have cast your gold or silver, you must dip your mold in cold water, whereby it will fall in pieces, and you shall find your branch of gold and silver in al points according to the pattern. All other necessary circumstances for this art doth presently insue.

You must first roast or burn the plaister of Paris,
C c before

Preparation
of the plaister

before you mix the same with the rest of the powders, which some men do in this manner. They break the stones in great gobbets, and then laying some coals in a little stone furnace, such as are sold at More-gate, they lay these pieces together upon the coals, and then cover them over with coals, and after kindle the fire at the top, and so let the same burn downwards, and with one fire so made they will be sufficiently burnt; then beat them into powder, and searce them as before, but if they break not easily, then they burn them longer. Others think it a better way (though more long and troublesome) to beat the plaister in a great iron Mortar to a fine powder, and then to set the same on the fire in a large strong earthen pot or pipkin, making a good fire under it, and stirring it continually with a wooden spattle, for an hour, or thereabouts, and untill you see the spattle leave as it were a visible line or tract behind it, after you have stirred the powder round about therewith.

Composition
of the pap.

Let your powder whereof you make your pap consist of burnt Alabaſter, & plaister of Paris, both of them finely powdred and searced, and of the like fine powder of new earthen pots, some use the powder of brick instead thereof. To 3 parts of the powders of Alabaſter and plaister first mixed in equal proportion, mingle one part of the powder of earthen pots or brick, but many do cast off in wax, onely in molds consisting in alabaſter alone, or plaister alone, or both together without any other composition.

There be some that think one shall cast more sharply if he do likewise grind the aforesaid powders upon a Marble stone after they be searced, but if you searce onely, the searce must be exceeding fine.

fine. *Qre.* If *Gypsum*, *alumen plumosum*, or spawd be not good to mingle with the rest of the powders. I have seen oftentimes many good patterns of mettall, cast off very sharply in spawd alone, but you must heat the flasks well, before you pour in the mettals, and you must sprinkle the spawd with some moisture, wherein there is some *Sal Armoniack*, before you do imprint your patterns; some do comend the light and downy substance, finely gathered from the uppermost part of the ashes of old coals.

Of the aforesaid powders you must take a reasonable quantity at once, putting the same into a stone porrenger, or wooden dish, and put thereunto some clean water, wherein some dissolve an ounce of *Sal Armoniack* to every pottle of water, and presently stir it well together, as before, to make a perfect solution and mixture of the matters aforesaid; this pap must not be made too stiff, when you cast branches of herbs or flowers, for then it would press the leaves together. Sometimes temper with warm water, and sometimes with cold, to make the pap dry the faster, for some kind of works.

Making of
the pap.

If you would attain to a perfection of this pap, you may weigh your powders before you put them into the water, and measure the water which you mingle with your powders, and trying several proportions of water and powder together, you may observe which of them proves best in the molds, and ever after continue the same.

Preparation
of the pap.

Some do mingle *Aqua vite*, some urine, and some put a smal quantity of *Sal Armoniack* to a great proportion of water, and therewith temper their pap.

Waters for
the pap.

As you pour in your pap, knock upon the Table with your fist, hard by the coffin, to make the pap

To settle the
pap.

settle the better to the bottom, and more close to the pattern.

Molds of two
parts,

If you would save your patterns, as being of Plaister, Wax, Metall, Alabaſter, &c. then take ſome clay that is well tempered, and not over ſtiff, and make the baſis thereof in diſcretion, according to the thickneſs of your pattern, and hollow or dimple the ſame a little, according as the faſhion of your pattern ſhall require: then preſs your pattern gently into that hollowneſſe, and with your fingers and knife together, work up your baſis with more loam, till by as near a gueſs as you may, the juſt one half of your pattern be even wrought up round about; then ſet up your loam ſides as before in your branches or flowers, and pour in of the pap likewise as before, till you have covered all the uppermoſt part of the pattern that lieth bare, with ſome reaſonable thickneſſe: then let it reſt a pretty while, till it be grown to ſome ſtiffneſs, and after take away your ſides, and you ſhall find the one half of your pattern truly imprinted upon the dry pap. Then lay that half upon your table, with the hollow part upwards, wherein the impreſſion remains, and clap on your loam ſides again, leaving your pattern ſtill within the pap, and pour more pap upon the pattern, till you have alſo covered the other part of the pattern with ſome reaſonable thickneſs as before; then let it dry, and take away the ſides, and dip the whole mold a little in water, and you may with your hands very eaſily divide the one ſide from the other. Take out your pattern, and keep it to caſt again withal, as often as you pleaſe. Note here, that you muſt print ſome little gutters or hollows in the loam, whereon your pattern lies after you have fitted it, with the juſt half

of

of your pattern, and this is because the pap which is poured on the second half shall fill up the gutters, or hollows, whereby you may, after you have taken out your pattern, know how to shut your molds very close together, which otherwise you should never be able to do.

You may neal many molds together, by laying one by one in a Chimney, with a small distance asunder, but first making a good lay of dead charcoal under them, and after cover them all over with charcoals, making sides about the coals of loose bricks; and remember to lay the ends of your mold, where the gitties or entrances into them are made, towards you, that as you shall see cause, you may now and then stoop and look into the molds, to see when they are thoroughly nealed, that you may surcease the making of any more fires.

How to neal
many mo'ds
at once.

It is also very requisite to have deep pans, very full of sand, or ashes that be warm, wherein to set your molds, when they are made ready to cast in, and then to fill up the molds even to the necks or gitties of them, for by that means you shall keep your gold or silver from passing through the molds.

Mold many branches of Time, Hyfop, Rosemary, &c. at once, that if some of them should fail, yet one or other might prove wel; for the charg is not great, neither of your molds, nor yet in the melting of your mettall.

Molding of
many branch-
es together.

When you mean to cast any gold or silver, you must neal the molds red hot again, and cast presently. But if in pewter or lead, a lesse heat will serve; And some use no heat at all, but cast the said mettals in the molds being cold.

What heat
to the molds.

You must make a vent with a straw from the bot-

Vents for the
molds.

some of the mold unto the top, whereby the metal (finding air) may run the better, or rather make a double vent from each side of the mold, this straw must be laid in the coffin, before you pour in the pap, and when the mold is nealed, the straw consumeth to ashes, and the vent appeareth; yet I have seen many patterns cast, without giving any vent at all.

Cleansing of
the molds.

Before you cast off, clear your molds from the ashes which are left behind, upon the consuming or burning out of the branches, flowers, wax patterns, &c. in this manner: presently after the mold is cold enough to hold in your hand, take it by the great end, and put the mouth or gitty which is at the other end, in the palm of your hand, till you perceive no more ashes to issue out of your molds, and after by applying the nose or pipe of a pair of bellows against the gitty, and so blowing out the ashes. Some pour in quick-silver at the gitty, moving the same up and down a pretty while, and so cleanse their molds.

Wetting of
the molds.

You may cast off in wax, in the powders aforesaid, but then you must hold your molds in hot water for a time, and so the work may the easier be taken out; and in the same molds you may cast off in wax divers times, one after another. Note also, that you must dip the said molds a pretty while in hot water before you cast off in wax, and presently after you have taken the molds out of the water, and before you cast, you must dry them with a sponge.

Times to
mold in.

Some are so precise in this art, as that they will never mold any fine patterns, but in fair weather, or in summer time, and perswade themselves that then their

their molds do receive the impression most lively, and also do dry most kindly.

Let your gitty wherein you pour your mettall be wide and large, according to the greatnesse of your pattern, for that the weight of your mettall being therein, will by the peiz thereof thrust down the rest that runneth first, into the farthest parts, or corners of the molds. Gitty large,

When your molds consist of two parts, before you neal them, you must with a knife, hollow, or take away some part of the gittie, in the inside of either part of your mold, making the same like a gutter, thereby to convey the mettall the better into the whole mold. Hollowing of the Gitty.

But if you will cast any imbossed patterns, of wax, or any other slender or curious patterns, that be under cut as they term it. s. such as stand antick wise, and whereof you may see some parts behind, which will not suffer them to come out of the molds without breaking either the patterns or the molds, then must you use this devise following. Take one pound of common glew, put thereto one ounce of yellow wax, (some put two or three ounces) but first dissolve the glew by a gentle fire, with a little water into a thick body, and after this solution, put in your Wax, into which Wax some do use to put a little quantity of the fine powder of charcoal searced, and some mingle the blacking onely that comes of the smoak of wax or rosen therewith. Then lay an even piece of loam according to the fashion of your pattern, but an inch broader then the patern, and in the midst thereof place your patern first oyled, then set up the loam sides of your coffin, and pour your glew thereon, being of a temperate heat and Casting in glue and wax.

and when it is throughly cold, take away the sides of lome, and take out your pattern gently. Note also that when you have molded any gentle pattern in glue, you may open the molds by flitting of them, or bowing them backwards thereby the easier to get the pattern without danger of breaking it, and yet the mold will return to his first shape.

Glew serveth
often,

Note that you may dissolve your molds of glue again, and cast often in them according to the manner before set down.

Whole pat-
terns cast with
out defacing
the pattern or
mold,

Qre. Of hanging patterns by a thread, in the glue aforesaid being first oiled over, untill the glue be cold, and somewhat stiff, and then carefully cutting out the patterns without impairing the molds. Here a good wit may find a great variety of matter whereon to meditate, but I hold it not convenient for the great hinderance to all the Jewellers, and workmen in gold and silver, to discover all the secrets either of this discourse, or of the rest that are contained in this discourse, and that for sufficient reasons best known unto my self, and such others as have spent their time, and thereby attained to any exquisite skill in this art of casting. Although I must needs confess that I have given sufficient light, even to the purblind workman to perform any excellent conceit by this discourse. And as I look for thanks of many that are ignorant herein, so I am sure to receive blame of those who with long travel and expence, have scarcely attained so much skill as they may find in this work with a few hours study. Neither may I safely set down the infinite use of this, for fear of the infinite abuse which would follow by the lewd, and sinister practises of idle, and ill disposed persons, that are ready with the Spider, to turn every thing which they touch into poison. Note

Note that your molds of glue must be thoroughly cold before you cast your compounded wax there. The true heat of your molds and wax, in, and the wax must be taken in a temperate heat, lest it happen to dissolve the mold.

Note also that the molds of glue, the longer they stand before you cast in them, the lesser they wax by To lessen your patterns reason of the water that vanishes away; and therefore it is an excellent devise, not onely to cast strange and hard patterns in, but also to cast of your pattern into a lesse compasse. So that if the graving of the workmanship of your pattern be grosse and wide a-funder, by this means it will become lesse, and shew much smaller and finer to the eye. And if at the first casting in glue, when your molds have stood three or four days to dry, your pattern come not little enough to your mind, then cast that little pattern again in glue, and let that mold lie as long a drying before you put in your wax, and so with often casting in this fashion you shall bring your new pattern to be of a great deal lesse compasse, and finer workmanship then the first pattern. Note also that it is very requisite to make your molds of glue very thick, for fear of warping, or casting awry. It is also thought very requisite to anoint your molds within very delicately with a fine calaber pensil, and with some of the thinnest of the aforesaid oils, before you put in your wax.

You may also cast all your metalline parts in brimstone, and from thence in wax, and after in alabaster, and so into metall. Casting in brimstone.

Some will mold great, and curious patterns in the crum of fine mancher well tempered into a past, Molding in crummes of bread, and pressed hard upon the pattern, and some commend flower, and the fat of Bacon dissolved, and strained.

Artificial wax
as cast in.

Note also that you must first cast all your curious patterns in yellow wax, tempered with the fine powder of small coal, and wrung through a cloath, and some think it best to put in the small coal powder when the wax begins to cool, and then to stir it well that they may incorporate together. But if you will cast off in red wax, then must you put in some red oker instead of small coal, to colour your wax withall. Some commend this composition of wax best *sc.* 2 parts of old yellow wax, one part rosen, and a little blacking dissolved and mingled together, and then streined through a fine cloth: and when you have once gotten your patterns in wax, then mold those waxen patterns in the aforesaid plaisters, alabaster, and brick powder, and then burn out the wax as before in flowers, and clear the molds, and so cast them into what mettall you please. Also when you have molded any pattern in glue, you may cast it of in Alabaster if you please.

Powders to
cast in.

Some do greatly commend the fine powder of Flanders melting pots that be new, and Bole Armoniack mingled together in equal parts, you must put this powder in water, and make agitation of them together, and then pour away the same water suddenly into some clean vessel, and put in more water, reiterate your agitation as before, and so continue this work untill your water which you pour away from the powders become clear; then let all this thick water so gathered together, settle wel, and then drein away the water by declination, and after dry this powder, and keep it to make pap thereof at your pleasure. And this was commended to me by excellent men for an excellent receipt.

In this manner following you may cast off in
wax,

wax, and also in waxen molds, which is a delicate and necessary secret for them that can tell how to use the same to the best purpose. You must take three quarters of a pound of rosen (yet some use no rosen at all) and a pound of yellow wax, and a handfull of sifted ashes, melt them all together, and put in the ashes when the rest is molten, (instead of ashes some use spawd, or plaister burnt as before) and presently after the putting in of the ashes, you must hold an iron that is red hot, or a great glowing coal to the dissolved substances, changing your iron or coal, as often as you shall see cause, for by this means you shall keep your materials from boiling over. In this substance you may mold any pattern that you please, then take out the pattern, and you may cast therein infinitely with a mixture consisting of two parts wax, and one part rosen; but let the same be but of a temperate heat when you pour it in, lest you melt your molds, and after it hath taken the impression, you may forthwith lay your molds in water to cool your infused substances the more speedily: wet those moulds onely with a fine cloth, or pen-sil, using no oil but in the gitty onely.

To cast in
molds of wax.

If you would have a strong composition, or earth wherein to cast great and grosse patterns of copper, latten, &c. Then take one part clay, tempering the same thoroughly well upon a marble, with flocks, adding thereto two parts of brick, and half a part of plaister well burned (as before) work all the said substances well and painfully together, and cast your mettall therein: after you have molded off your patterns, you must set your molds in a vessel full of sand and presse the same as hard as you can about the mold, even from the bottom to the top thereof. And

Strong molds
for grosse pat-
terns.

some use to cast copper, & latten works in high-gate sand, some in lome onely, some in cuttle bone, and divers other substances, which because they are more common then the rest, I passe them over in silence.

Matters to im-
bosse in.

The Potters white clay is very good substance to imbosse in, if you dry the same thoroughly, and after beat it into fine powder, and then searce it, and temper it with warm water. In the working, and alwaies when you leave work, keep your clay moist in a wet cloth, till you have cause to use it again.

The lasting of
the powders.

Some hold opinion that it is best to spend your aforelaid powders while they are fresh, and before they have lain long, for that the plaister of Paris being of an attractive nature, and desirous to gain the moisture which it hath lost in the burning, will lose his binding force if it be not quickly spent, but after your molds be once nealed, you may keep them a long time, so as you stop the gitties of them, that no dust may enter into the molds.

Oiling of the
patterns:

Oil all your patterns of mettals, plaister, or wax with a fine pensil, and with the oil of sweet almonds, but others esteem the oyl of Turpentine or Spike, to be the best, by reason of their thinnesse, whereby they will not fill up any part of the work. Then you must pat the patterns gently over with a little clean bumbast, that you may leave the oyl very thin upon the pattern, some use *aqua vite* onely. And some oil their wooden patterns with oil of wex, butter, or lard melted, to keep them from blistering in the molds.

The heats and
roughning of
Sol and Luna:

Learn of the Goldsmiths how to take your gold and silver in their true heats, as also with what additions to make the mettall run the better and sharper, and how to toughen them both, that your work prove not brittle. If you find this work either too trouble-

some

some or too curious, then make your molds ready, and carry them to some Ooldsmiths, which have their apt furnaces for the purpose, and let them heat and roughen your mettals, and then cast them in your molds so made ready as before.

How to colour your patterns in gold, and how to boil those that are cast in silver, I must refer you to the Goldsmiths, although I could easily set down both the matter and the manner thereof, but because therein I should discover a secret, that Concerneth their whole Trade, I have thought good to suppress it for this time.

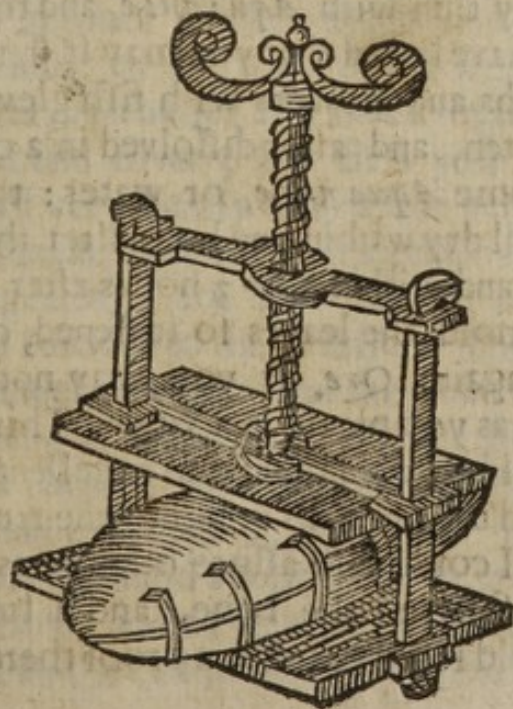
The first time that you cast off your pattern, it will come most sharply, if the work be performed as it ought, and ever after more bluntly, but yet the self-same pattern will serve oftentimes, and deliver his impression truly, though not so perfectly in the eye of a workman as at first.

Note, that you must have a little presse of Cop-

Colouring
and boiling of
Sol and Lu-
na.

Which part
tern commeth
sharpest.

A Copper
presse



Cramping
wires.

per or Iron to hold fast your molds after they are made ready to cast in, especially when your mold consists of two parts, and the outsides of these party molds you must cramp together, when the molds are cold, with many little Iron wires made for that purpose; and then with a knife close the joynts all over with some of the said pap, which closing or luting you must also reiterate if you see cause, after the molds be nealed, placed in your press, and ready to receive the metalls, at which time it shall not be amiss in like manner to close up and stop all the cracks or chinks of your molds which you shall find in them after they be made ready to cast in, for otherwise your metal will oftentimes run through your molds, and then is all your labour lost.

Preparing the
herb or flower.

But in the casting of branches of herbs, or flowers, some commend the sprinkling of the branch or flower first over with good *Aqua vite* well rectified, and some wet the branch first with a little pap that is made very thin with *Aqua vite*, and the aforesaid powders. I have heard that you may stiffen the leaves of your herbs and flowers with fish glew, finely sliced and beaten, and after dissolved in a clean leaden pan with some *Aqua vite*, or water: the leaves so stiffened will dry within one hour after they are dipped therein, and within 2 or 3 hours after at the most you must mold the leaves so stiffened, or else they will relent again. *Qre.* If you may not keep them stiff as long as you please in a stove. This I have not proved, but I had the same of an excellent workman, who assured me upon his credit of the truth thereof, whereof if I could also assure others (as hitherto I have not disproved the same, and a smal time or charge would serve to make a proof thereof) I know

not

not how to commend the same sufficiently for the infinite uses whereto it might be applied.

Some do make a composition of 4 parts of new Tyn, to one part of Latten, and cast divers patterns therein. A composition of Tyn.

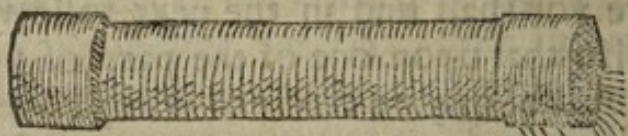
If you would cast an egg, or any other pattern hollow, thereby both to have your work the lighter, as also to spare gold and silver, which grows to be costly in sad works; then must you line both the insides of the party mold with thin paste, made of tough flower, and water onely, and wrought into an equal thickness by means of a rowling pin, whose portraiture you shall find in the next following page. Note also that upon one of the parts of your mold there must be made a crosse of wire, fastned into the mold by turning the ends of your wire into the same; then lay both the sides of the mold together, each of them having their thin past fitted within, just with the circle thereof: Then at the gittee of your mold pour in some plaister made into pap, if you cast but in lead, or else some of the first compositions. Plaister, Alabaster and Brick together, if you cast in gold and silver; but first you must anoint all your past very neatly with a fine pencil, and with the fat of Bacon, melted with a gentle fire, and before it congealeth; for this maketh your work to come very smooth to the outside. Then take your mold in sunder, and take out the paste out of either part, and hang in the core again in the first holes, set your mold together again, cramping, and luting it on the sides, and then Neal it, and pour in the metal, which running round about the core, must of necessity be hollow, and of an equal thicknesse; then at some hole in the end or side of your work, you may pick

pick out all the plaister, or other composition, and so you may cast any pattern both light and hollow: you must also remember to make your gitty, and to use the other means before set down, to make the one side of your mold meet with the other.

You may cast hollow and light either in lead, pewter or wax, if after you have cast your work solid, you pour out again at the bottome thereof so much as will run, but the exact time when to pour out, must be gotten by often practice, and cannot well be expressed in words.

You must have a rowling pin of a foot long, made

The rowling
pin.



of six or eight inches compasse, and the same taken down the thickness of a shilling all the length thereof saving half an inch at either end, wherby you cannot fail to make your paste all of one just thickness.

To mold the
hand or face
of a man.

In the aforesaid glew you may mold ones hand or face, if the party be first laid on his back, with his eys plastered over, his nose and ears stopt with wool, and his mouth closed up, saving that in the midst he may draw breath at a little hole at a pipe or quill, and then set your sides of loam, as before, about his face, which some anoint over with oil (as before) and pour on the aforesaid glew, being but temperately warm. This is an excellent device to have the lively counterfeit of the true favour and countenance of every man.

The placing
of your branches.

Some hold it best to set your flowers and branches upright, and not overthwart wise, with their tops upwards, before you mold them, for so they are perswaded

swaded, that the leaves will spread abroad the better, and divide themselves in sunder, whereby the metall may run into every leaf severally.

Some kill Toads and Frogs, which they mean to cast, by leaving them in oyle till they die, and some put strong water into their mouths. As for flies, spiders, grasshoppers, and such like, you may keep in close boxes, and let them die for lack of air, and then mold them whilest they are stiff.

Killing of the
beasts.

If you would take but the print of any work, graven either in brass, wood, or other body; First, with a sponge lightly wet over your paper with fair water (some commend Allom water) then make a sable colour with the fume of searing wax candle, in a spoon, porrenger, &c. to the which put a few drops of sallet oyl, or of the extracted oyl of Cloves, temper the same well together, and put it lightly upon the engraved pattern with a quilted leather, such as Printers use; then clap the print upon your paper, lightly wet as before, and take off the paper, and you shall find the impression very fair, if you do it carefully. Note, that if your patern be of wood, you must lay the same first a pretty while to soke in water, before you lay on your sable upon it, because the wood will dry up the colour exceedingly. Note also, that the smoke of tallow makes a good sable, the smoke of rosen a better, but the smoke of wax gives the best of all other, and thereof is made that excellent velvet black, used in the art of Limning.

To print graven
patterns
upon paper.

It is a pleasing and commendable practise by this art to mold off those excellent counterfeits, of carv'd or imbossed Faces, Dogs, Lions, Borders, Arms, &c. from Tombs, or out of Noble mens Galleries: as also of Pillars, Balls, Leaves, Frutages, &c. therewith

Special uses
of this Art.

Ee

to

to garnish beds, tables, court-cupboards, the jawms and mantle trees of chimneys, and other stately furnitures of chambers or galleries. But I may not disclose the whole Art with every circumstance, whereby to make the same contemptible with the vulgar sort: onely I will give a tast thereof unto the sharper wits, who with some study and practise may reach unto the full perfection thereof. And therefore, whosoever can first dissolve I singlals or fish glew, as it ought to be, and after harden the same by such means, as that no sudden moisture can make it to relent or give again, the workman and Artist, whatsoever he be (and I am sure there be some such, though but very few that I know in England) may cast many rare and excellent patterns, in the fine filed or rased dust of Brasil, Box, Jet, Amber, Alabaster, Ebony, Elephants tooth, and such like, being first well tempered with the glew, so dissolved, or with the pap of common paper, being well wrought and labour'd with the hand of a workman. And he may also make his molds of the finest and whitest Potters clay, when they have wrought and tempered it first in their manner. Or else if some excellent Carver in wood or stone did carve some excellent piece of a border, of a half yard long, & a foot in breadth, with antick faces and personages, or other frutages thereon, and with the coat-armours of Gentlemen, and other pleasing devices to garnish the same; the aforesaid Artist might thereby easily, and with smal cost, cast off whole borders for chambers or galleries, in the aforesaid substances or composition, which would seem to be of infinite charge. And for the better encouragement herein of those that shall be doubtful and suspicious of this skill, let this satisfie them,

them that I have seen, not far from London-bridge, divers excellent and carved patterns cast off in sand, and common glew, but they would endure no weather, yet they will serve sufficiently within dores, so as they be kept dry.

143. *A new kind of Fire, of lesse charge then ordinary with Sea-coals.*



THis fire is of much less charge then the ordinary sea coal fire. It is much sweeter in the burning, and more beautifull in shape, being made in the form of balls, with a little artificial Salamander. It is very durable and lasting; it is not so offensive either in smoak or cinder, as the Sea-coal fire.

It will be an especial means to preserve Timber for the building of ships, and other necessary uses: It will bring charcoal and billets to a more reasonable price, for that by the use of such a Furnace or Iron as this, there will be great store of Coals and other fuel preserved.

144. *A Vessel of Wood to brew or boil in.*

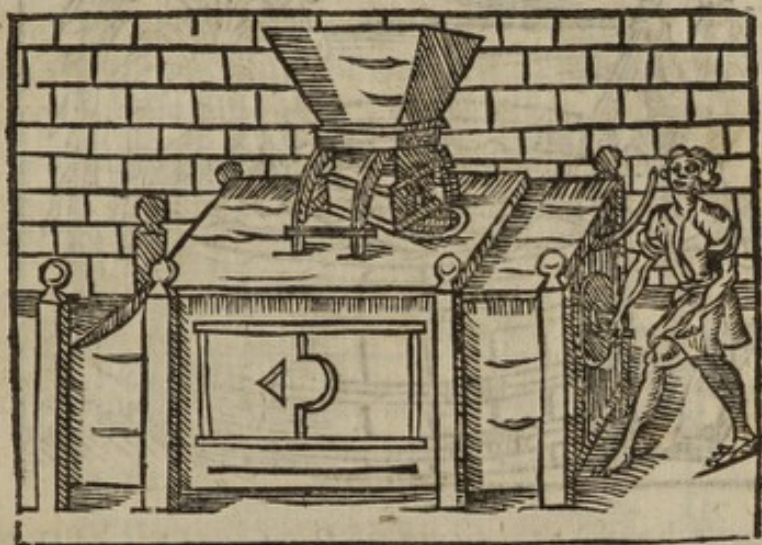
THat the same is truly and really performed, I appeal to the proofs in my *Apologie* published *An. 1593*. And if there be yet any manner of person that shall (notwithstanding my testimonies therein produced) either perversly hold the same to be impossible, or maliciously and slanderously reprove the invention of untruth; then let him wage such a competent sum of money, as may make an experiment thereof, and he will find the conveniency that ensues.

But admitting the same to be true (and that my artificial Salamander will not burn in the fire) then I say, that these brewing vessels will be much cheaper then Copper Kettles, yea, almost according to such difference as is between copper and clapboard, either in matter or workmanship.

These wooden vessels, in respect of the fire, will last twenty years at the least; and if the element of water had not more power over them then the element of fire, I think we should not need any new vessels, but for new ages.

And that which I do more esteem and commend in them then their lasting, is, the saving of fuel, which cannot be lesse then a moyety of that which is now usually spent in the houses of all the Gentlemen and Farmers of this land.

These vessels being once prepared by the Author, may afterwards from time to time, with little labour and less cost, be repaired by the owners themselves, with such art as shall be manifested to them upon their first handsel.

145. *A Boulting Hutch.*

THe price hereof is easie in respect of those good uses for which it serves. This Engine avoids all waste of meal and flour, and yet it divides the bran sufficiently from the flour. It will be a means to save boulders, which is a matter of great charge unto the Baker.

But the especial use thereof, is, to avoid that gross and uncleanly manner of boulding which the Bakers for want of this Engine are forced to use. All objections that were made against this invention, by the Bakers of the City of London, upon the view thereof, were sufficiently refuted, in the presence of divers Citizens of good worship and account, and therefore what inconveniencies soever shal hereafter either by them, or by any other be pretended against the same, I would have them held for false and malicious. This boulding Hutch is very durable, neither will it be chargeable in reparation to the owner.

146. *A Portable Pump.*

IT will be in price one of the cheapest Pumps of all that I know or ever heard of, and will require but small reparations.

It is light in carriage, and may be transported from place to place, by one single man without any further help.

With the easie labour of one man, it will deliver four, five, or six tun of water, every hour, according as it is in bigness; neither can a man possibly be weary, though he should work five or six hours together without intermission.

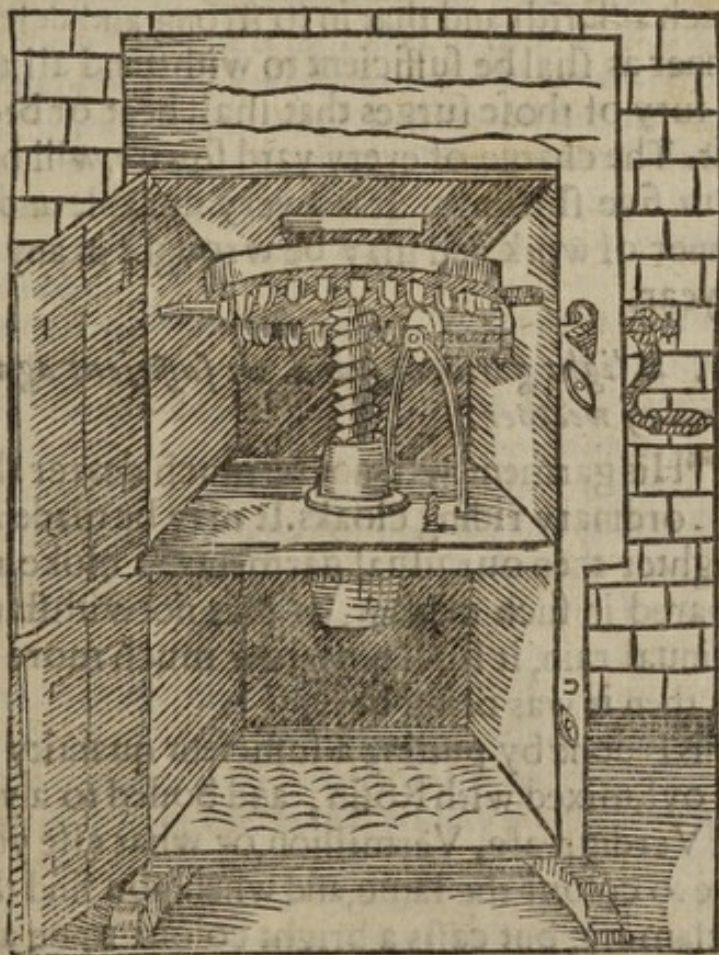
Being placed in a fir tub that is bored full of holes, or fastened in the water to a piece of Timber; it is a very apt instrument for the dreining of the fen countries, or any other surrounded level, or standing water, pool or pond, because it is so portable, and needs no fastening at all on the ground, as other Pumps do.

It is also a very convenient Pump for all such as dwell near the river of Thames, to force up water
for

for the service of their Kitchens, which may be performed in a most reasonable manner.

It is not amiss, to have two or three of them in store, for the necessary service of every ship in her fight, if any occasion be offered to use them upon any great or sudden leak: they are but little, and require small stowage.

147. *A wholesome, lasting, and fresh victual for the Navy.*



An Engine for
the making of
this victual.

When Corn is sold for twenty shillings the quarter, then eight ounces thereof may be afforded for a penny, which is a competent meal for any

any reasonable stomach, and serveth both for bread and meat. It is in shape like wafers, light of carriage, and will last two or three years sound and sweet if it be kept dry. It may be used now and then for change of diet. Being carefully handled in the dressing, it will be pleasing enough to the Mariner.

148. *A speedy way for the inning of any breach.*

Think it possible by this device, having prepared so many artificial stones as shall be requisite in this work (in one months space to shut up the great breach at Erith, and that in so strong and defensible a manner as shall be sufficient to withstand all the rage and fury of those surges that shall beat or break upon it. The charge of every yard square, will be much about five shillings. It is a very durable and lasting manner of work, and may be wrought in any time of the year.

149. *A light garment, and yet sufficient against all rainy weather.*

This garment will not be much dearer then our ordinary riding cloaks. It may be made as light or lighter then our usual garments. A cloke may be prepared in such manner, as that notwithstanding a continual rain, it shall not grow much more ponderous then it was being dry.

This is done by putting a sufficient quantity of Linseed oyl, mixed with Rosin, and boiled to a vernish, with Verdigrease, Vermillion, or what else you will chuse to colour the same, and when you find that it is not clammy, but casts a bright colour upon a rag of cloath dipt in it, then dip therein your cloth, whereof you would make your garment, and spread it abroad and let it dry leisurely.

An



An Additional Discourse of several sorts of Stones, Minerals, with Gums, and the rare vertues and uses thereof.

ALthough the word *Mineral* signifies mettall, or any thing digged out of the earth, yet I shall not need to discourse of some of those sorts, as Iron, Tinn, Copper, and others that are within every ones knowledge, but my drift is to speak of those things that are most rare, and the use least known; beginning first with *Quicksilver*, which some Philosophers call the *mother of all mettals*, and doubtless is of most secret nature, and is as excellent in operation, as it is of variety in use and practise.

Quicksilver ingenders in the earth, yet seems to be of such a subtil body, that the earth cannot hold it, secretly making its passage through the same, and working it self through several veins thereof, which some take to be the cause of those damps, which at certain times do come in Coal-pits, and such like places, and an Apothecary did affirm unto me, that not long since he found in a Cellar a great quantity thereof, and by fortifying his spirits with strong water; he got plenty of the same for his use. It is in it self no lesse then a cold poison, yet being prepared according to Art, it is of Sovereign use in Physick, and sometimes it is given in its natural body, an ounce and a half or 2 ounces at a time, inwardly, for a stoppage in the guts, and some take it in milk to kill worms, but let them be sure that the quantity given be ponderous enough to make its way clean through the body. This mineral is also of singular use for dividing and parting of mettals, its own body being afterwards evaporated with the fire according to the art of the Refiner. Lastly, *Quicksilver* hath its denomination from *Mercurius*; for the ancient and best Philosophers contract all mettals into seven, according to the number of Planets by whom they write that they are governed.

F f

Lead,

Lead.

Lead is another sort of Mineral, and of this there be several sorts, viz. white Lead, black Lead, and red Lead, the uses of all these sorts are several, and being well known I need not to speak any more thereof.

Bole-armoniack.

Bolearmoniack, is a reddish mine, or stone; the goodnesse whereof is discerned by touching it with your tongue, and if it cleave fast to the same, it is the best *Bolearmoniack*; it is of a very binding nature, and much used in the making up of divers plaisters, and is also of great vertue against the Plague.

Vermillion.

Cinoper is a soft red stone found in Mines (very admirable for its colour) commonly called *Vermillion*.

Abeston.

There is brought out of Arabia a stone called *Abeston*, of the colour of Iron, which hath so rare a vertue, that being once set on fire, it burns like a torch, and can very hardly be quenched. I wonder some ingenious Engineer, or Fire-Master, doth not make some trial hereof, for doubtless he would find out some rare experiment thereby, very worthy, and richly answering his expectation.

Diamonds.

We have in England a stone or mineral called a *Bristol stone* (because many are found thereabouts) which much resembles the *Adamant* or *Diamond*, which is brought out of Arabia and Cyprus; but as it is wanting of the same hardnesse, so falls it short of the like vertues; and though the *Adamant* be the hardest of all stones, yet is it softened with *Goats blood*, and there is a special Antipathy between that and the *Loadstone*, which is of the colour of rusty iron, and hath an admirable vertue not onely to draw Iron to it self, but also to make any Iron upon which it is rubbed to draw iron also, it is written notwithstanding, that being rubbed with the juyce of *Garlick*, it loseth that vertue, and cannot then draw iron, as likewise if a *Diamond* be layed close unto it.

Loadstone.

This stone is found in the *Indian sea*, and also in the Country of *Trachonitis*. It is of greatest use in navigation, for by it Sailers find out the certain course of their voyage, the *Needle* (in their *Compass*) tempered herewith, still standing directly towards the North and South.

Berill.

The *Beril*, is a precious stone, brought out of *India*, cut most commonly with six corners, and set in *Rings*. It is of a greenish colour like unto the sea.

There

There is a stone brought out of *Æthiopia* and *Arabia*, of a **Bloud-stone** dark colour like unto congealed blood. This stone is of nature very astringent, stopping issues of blood, and is sometimes made use of for the eating of proud flesh out of wounds, it being of far greater efficacy then burnt Allom.

There is another stone, which although I cannot properly call it **Bezar-stone** a mineral, yet for the rare vertues it hath I cannot pass it by without some observations thereon. It is of excellent vertue against poyson, very costly, and of great account in Physick, being compounded of certain thin scales one upon another, like an Onion, and if it continue long in water it melteth: The middle part is somewhat hollow, and full of powder, of the same nature the stone is of, which is a sure mark to know whether the stone be fine and true.

This stone is taken out of a beast in *India* much like a Hart, save that his horns are like Goats horns. The occasion of this stones growing, some write to be this: This beast going to the den of Serpents, doth with his breath compel them to come forth, and then eats them; then he goes and plungeth himself into water till he perceiveth the fury of the venome to be past, and till then they will not drink a drop; after this, they feed upon many healthy herbs, known to them upon natural instinct, to be of vertue against poyson, and by the mixture of these herbs with the Serpents eaten before, these **Bezar stones** are very strangely engendered within them. It is often given in high Fevers, and to defend and support the heart, and drive any evil matter from it, 3, 5, or 7 grains at a time, according to the nature of the disease, and the strength of the patient.

There is a precious stone (rather for its lustre then any other vertue I find of it) called a **Chrysolite**. It is of the colour of Gold, and shineth brightest in the morning, and is apt to receive damage if it be held too near the fire.

An **Emerald** is a precious stone, the greenest of all other, for which cause it is very comfortable to the sight; the best of these stones are brought out of *Scythia*, and *Albertus* writeth, that if the Emerald be good, it inclineth the bearer thereof to Chastity, and cannot endure the action of Lust; but I do not know whether it retaineth this quality in so cold a Clymate as *England* is.

- Jacinth.** In *Æthiopia* is found a precious stone, called a *Jacinth*, whereof we find two kinds, the one of a pale yellow colour, and the other of a clear bright yellow, which is accounted the best. It is cold of nature, very comfortable to the body, and provoketh sleep.
- Jasper stone.** The *Jasper* stone is of divers colours, but the best is green, transparent with red veins, and sheweth fairest being set in silver, and is good to stop any issue of blood.
- Jasponyx.** The *Jasponyx* is a precious stone, of a white colour, with red streaks; and the *Iazule* is of a blew azure colour. They are both very costly, and therefore are best for the eye-sight, if a man hath them of his own. The *Iazule* is a kind of Marble, and in some cases may be used in Physick; it is hot and dry, and being well prepared is good against melancholy, and by cleansing the blood, it hath a secret vertue to preserve one from Leprosie.
- Jazule.**
- Lyncuris.** The *Lyncuris* is a bright shining stone, and sometimes of a dark yellow colour like Saffron. This stone groweth of the urine of the beast *Lynx*, being congealed; which urine the *Lynx* hideth (as *Pliny* writeth) because men should not find it. It is good against the pain in the stomach, yellow Jaundies, and loosenesse of the body.
- Onyx.** The *Onyx* is a precious stone found in the mountains of Arabia, of the colour of a mans nail. Some write that it is congealed of a juyce, dropping from a tree called *Onicha*, which is the cause that it smelleth sweet being cast into the fire, as also that it is often found with divers pictures in it, being easily therein fashioned, before the stone be throughly hardned.
- Opal.** *Opal* is a precious stone of divers colours, wherein appeareth the fiery shining of the Carbuncle, the purple colour of the Amethyst, and the green shew of the Emerald, very strangely mixed together.
- Topase.** The *Topase* is a precious stone, whereof there are two kinds, one of the colour of Gold, and the other of a Saffron colour not so good as the first: It is written, that this stone being put into seething water, doth so cool it, that one may presently take it out with his hand.
- Orchal.** *Orchal* is a stone resembling Allom, and many do make use thereof to make them have a red and perfect colour.

Margarites are little Pearls found in shell fish, especially in Margarites. Oysters, whereof some have holes in them, and some have none; the best are brought out of India, yet they are also found in our English seas, as also in the Flemmish and Almain, and the fairest Margarites grow in young shels. Some write, that in Thunder the Oysters do cast them up as it were in way of abortion, which is the cause they are often found in the sands. They are sometimes used by Physicians in Cordial confections, for they comfort the spirits, and are therefore good against sounding, having vertue also to stop issues of bloud, or any loosenesse of the body.

I have seen very fair Margarites also taken out of a shell-fish called a Horse-Mussel, and on the inside of the said shell remains the true mother of Pearl. I knew an honourable Lady, which by the imploying three or four men to catch these fish out of the waters, took with a little charge so many ripe Oriental Margarites, as made a very rich double Necklace. Also I knew one Mr. *Primas Davis* (a very ingenious Gentleman) who by making use of some vacant hours in taking up these shels, in a short time got so many Margarites of an even size and good colour, as made him a very choice Hatband. The shels of these fish are on the outside very black, and not so great as other Horse Mussels. I have seen some in Buckinghamshire, and other Countreys; and they are so plentiful in some parts of the river of *Clun* (which cometh out of Montgomeryshire through some part of Shropshire) that they do more then cover the bottome of that river, and were it not for the deepnesse of the water, there would be no difficulty in taking of them. I have some few of the said Margarites, which I took out of the shel my self to see the experiment, and I further gained this knowledge thereby, That all such that have Margarites in them, are rough and craggy on the outside, the rest are all plain; by which observation I soon avoided fruitlesse labour, in opening of such as had nothing in them. I found also many fair ones which were not fully ripe, and so came short of that bright Oriental colour which others have.

This I have been the larger in discoursing of, because it is a rarity that our own country affords, and is lesse known and spoken of, then some things that are of lesse worth, and great note here, which come as far as Asia.

Iron-stone;
&c.

White Ore.

And although some parts of Wales are very barren by reason of the rockiness thereof, yet I have observed that even where the earth is least fruitfull for corn or grass, there it is most rich in Minerals, as for example, I have seen digged out of one and the same mountain, Free-stone, Iron-stone, Lime-stone, Pit-coal, and fine Potters clay, such as we make Tobacco pipes of.

I have also digged out of a mine, a bright sort of Ore, much like unto lead, and very ponderous, the use or vertue thereof is not known, and yet there seems to be great quantities thereof, and is certainly worthy the trial and experiment of the skilfull Artist. I have also seen a rock of pure white stone, and in glittering and brightness far exceeding the Alabaster, onely it is something softer, and not altogether so ponderous; it is at least very delightful to the eye, and doubtless would be found of singular use were there any plenty thereof brought up to London.

I could enlarge my self very far in discoursing of several other minerals, which our own land affords, but for that I shall refer you to the foregoing part of this book touching Marls; and shall wind up all in this.

A Jeweller of my acquaintance riding into Suffolke, took up in the high way, about four miles from Sudbury, a small stone of a reddish colour (like unto a dull or course Ruby) and upon trial thereof in the cutting, he found it to be of profitable use. In somuch that shortly after he made a journey down on purpose, and found such a quantity of those stones amongst the pibbles and gravel, that he was wel paid for his journey, and hath to this day wherewith to pleasure his friend. And now a word or two of the Carbuncle, and so according to my promise I proceed to Gums.

The word
Carbuncle,

Carbuncle hath two significations, namely, a precious stone, and a dangerous sore. A Carbuncle stone is of the colour of fire: It hath many vertues, but chiefly prevails against infectious air; the best of these stones will shine in the darkness like a burning coal. These stones are found in *Affrica*. Secondly, a Carbuncle is a disease, botch, or ulcer, in Greek *Anthrax*, caused of gross hot blood which raises blisters, and burns the skin; and this disease is ever accompanied with a Fever.

Camphire,

Camphire is a little kind of Gum, as *Avicen* writes; but *Plantarius* saith, it is the juyce of an herb; it is of a white colour, and cold and dry in operation, and more frequently applied outwardly, then taken inwardly.

Amber

Amber is a kind of yellow Gum, and becommeth very hard *Amber* in drying. *Messie* saith, that it groweth upon a tree, called *Ibex Romana*; but *Dioscorides* saith, that it falleth in manner of Liquor from the Poplar tree in the River *Po* in *Italy*, where it congealeth, and becommeth hard. It comforteth the brain, and is very good against consumptions. This Gum hath also an attractive virtue like the Loadstone, for if it be right *Amber*, it will draw a thread of Linnen unto it in the same manner as the Loadstone draws Iron. This is not that which is called *Amber-greece*, for that is not any Gum.

Assafetida is a dried Gum or Liquor brought out of *Media* *Assafetida* and *Syria*, of a strong loathsome savour, and is sometimes applied outwardly to the body, but it is most commonly used to allay the fits of the Mother by smelling to it; they write that inwardly taken, it hath the like operation of *Cantarides*, to provoke lust &c. But let him that taketh it have regard to the quantity, as well as how it is to be mollified, lest he find as bad an inconvenience, as many have done by taking *Cantarides*, which hath caused them to piss blood many days after.

Ammonick is a kind of Gum like Frankincense; it grows in *Ammonick* *Lybia* where *Ammons* Temple was. There is a kind of salt so called, which is found in *Africa* under the sands, and is like *Al-lom*. This being applied to the side, helps the hardness and pain of the Spleen.

Anime is a white Gum, brought out of the West Indies which *Anime* is very pleasant in smell, and of little other virtue.

Bdelium is a Gum brought out of *Arabia*, or the Holy Land, *Bdelium* of a sweet smell and bitter taste, (which in part makes good the old Proverb, *That all things that taste well, smell well; but all things that smell well do not taste well.*) It hath virtue to mollifie hard swellings, and is good against stiffness of sinews, and other parts, and against the biting of some venomous beasts.

Benswine is a sweet smelling Gum, and is good against hoarseness and the Cough, being dissolved into water, and drunk. It hath many other excellent virtues in Physick, but the tree whereon it groweth is not certainly known.

Carranna is a Gum brought out of the West Indies, of great *Carranna* virtue against Aches proceeding of cold.

Tragacanth is a kind of Gum, the best whereof is clear, and *Tragacanth* some.

somewhat sweet in tast; it is often used against coughs, and rough hoarseness of the throat, and if it be made into a confection with other simples, it is good against hot diseases of the breast, Plurifies, inflammations of the Lungs, and distillations from the Head, &c. This confection is called at the Apothecaries *Dia Tragacanthum*; but I would rather commend to my friends *Dia Triosantalon*, which is good against the aforesaid griefs, and against burning Agues, and to refresh the inward parts, inflamed with too much heat.

Euphorbium

Euphorbium is a Gum, or the tears of a strange plant growing on the mount *Atlas* in *Lybia*; it is yellowish, clear, and brittle, and may be used in Palsies (made into an ointment) as also for the cramp and sinews that are strunk; but to be taken inwardly it is very dangerous, unless the malice thereof be well corrected, for it scaldeth, and is exceeding hot, even to the fourth degree.

Galbanum

Galbanum is a Gum or liquor drawn out of a plant in *Syria* called *Mercopion*; it is of a strong savour, and very pure, close, and firm, neither too moist nor too dry; it is good against an old cough, and for such as cannot easily fetch breath, and the perfume thereof drives away Serpents from the place where it is burnt. It being applied to the womb of a woman, hastens both birth, and after birth, and being applied to the navil, it slaieth the strangling of the womb, commonly called the fits of the mother; it helpeth pains in the sides being applied thereto, and the smell thereof helps the vertigo or dizziness in the head, as *Galen* hath it.

Gum Arabick

Gum *Arabick* grows in *Egypt*, upon a little Thorn tree, called *Acaeia*. The Ladies now a days make use thereof to fasten on their black patches, but it is of better use for making of ink, as also with the confectioner, and is of several other common uses, of which it is not my intent to treat here, as holding it too vulgar a subject.

Hypoquistidos

Hypoquistidos, is a gum or substance that grows at the roots of a plant called *Cistus*, which being bruised yeelds a liquor called by the Apothecaries as aforesaid; it is cold of operation, and hath a special vertue to stop all bleedings: Lasks, and Fluxes of the belly: We have also a certain kind of plums sold by the Apothecary, called *Injubes*, which is in fashion much like an Olive, but in tast sweeter, having a hard long stone, and being kept long the

they are dry and full of wrinckles, they are temperate in heat and cold. They are good against all exulcerations of the bladder and inflammations of the kidneys and the liver; for when once these parts come to be defective, the cure thereof oftentimes proves like *Hydra* (the beast with whom *Hercules* fought) that having one head cut off, there presently sprung forth two heads in the same place.

Lacca, is a kind of a red Gum brought out of *Arabia*, good against diseases of the breast, and comfortable for the Liver, but it must be compounded with such things as have a secret faculty to convey the vertue thither. Lacca.

Laudanum, is a yellowish Gum, as some write; notwithstanding others affirm it to be made of a dew, which falleth upon a certain hearb in *Greece*. *Avicen* saith, it is taken hanging on the hair of a Goats beard that hath fed upon that plant. It is hot and dry, and sweet of smell, if it be pure. It is often used in Pomanders, and being anointed on the head with oyl of Mirtles, it doth strengthen the skin, and keep hair from falling off. It opens the mouth of the veins helps pains in the ears, and hardnesse of the womb, but is not at any time taken inwardly, as many other gums are, being put into ointments, it is very strengthening, and comfortable for the sinews. Laudanum.

Larch Turpentine, is a Turpentine or Rosin, growing upon the Larch Tree in *Italy*, used often in ointments and implasters, to cleanse and heat wounds, it may be also taken inwardly with honey, and then it cleanseth the breast, looseth the belly, and expelleth the stone and gravell; it is also good against the spleen: but that which is most proper and efficacious against that grief is *Tamarisk*, which is a little tree bearing leaves not much unlike to heath. The decoction whereof taken with wine and a little vinegar, is of great vertue against the stopping or hardnesse of the spleen or melt. For this tree by nature doth so wast the melt, that Swine which have been daily fed out of a vessel made thereof, have been found to have no Melt at all. Larch Turpentine.

Turpentine, being washed and refined is called *Venis Turpentine*, which being incorporated with Cinamon, Nutmeg and the blood of Dragons, or Gum Dragagant, and made into Pills, is good for a pain in the back by reason of weaknesse, and for the running of the Reins.

Mastick

Lentisk, is a tree growing in divers hot Countreys, which beareth the notable Gum called *Mastick*. The leaves and bark of this tree stop all Loosness and Issues of blood whatsoever, We have in *England* also a kind of fruit or grain, called Lentils, round a little flat, and of colour something black, or brown, which being boiled but once, they loosen the belly, but at the second boiling in another water, they are of a binding nature, being then good to stop the Bloody flux, or any looseness of the body.

Mastick strengthens the stomach, and helpeth such as vomit or spit blood: It fastens the teeth, and strengtheneth the Gums being chewed in the mouth, and is of great use in Salves and Plaisters.

Amber

Liquid Amber, is a sweet Rosin, brought from the West-Indies, comfortable to the brain, or any grief proceeding from cold causes. This is not that which is called Amber-greece, which *Misue* calleth, The Spawn of the Whale Fish: *Avicen* affirmeth that it groweth in the sea; others write, that it is a foam cast up on the shore, and found cleaving to the stones, which I rather incline unto, because I have heard of some quantity thereof found near the sea shore in *England*. The same thereof is good against the Falling sickness, and comfortable for the brain.

We have also a thing called *Litargie*, which is a foam that riseth from Lead, when it is tried; It is cold of operation, and often used by Chyrurgians in Oynments and Plaisters, being of a gentle drying, and cleansing, binding nature.

Manna

In holy Scripture we read of *Manna*, to be a delicate food which God sent from heaven to the Israelites in manner of a dew, white, and somewhat like Coriander seeds, with which the Israelites lived forty years in the wilderness, till they came to the borders of the land of *Canaan*: At the first sending hereof, the people were in such admiration, that they said *Manhu* (*id est*) What is this? which seemeth to be the cause, why it was afterwards called *Manna*. Some Physicians say it is a kind of Gum, but others take it to be a kind of Dew which falleth in hot countries upon trees, and there congeals, almost like Crums of white bread, and is gathered, and choicely kept, as a gentle purger of Choler. It is also comfortable and strengthening, and may be given to children, and is very good for elder persons which are in any

any consumption, or any weaknes, being dissolved in Goats milk, Asses milk, or the milk of a red Cow.

Whilest I am speaking of things that are of nature cold, if it might not be thought too far a digression from my former discourse, I would speak a word or two concerning the Mandrake. Mandrakel

A Mandrake, according to the common sence in Physick, is an herb bearing yellow round apples. The root of this herb is great and white, like a Radish root, and is divided into two or more parts, growing often like unto the legs of a man. This root, but especially the bars thereof, is extremely cold and dry, even to the fourth degree. It is therefore very dangerous to receive inwardly, for that the least quantity too much will kill any man. Chyurgians use to steep this root in wine, and give it to such as they cut, saw, burn, or take off a limb; for the cold operation thereof causeth a dead sleep, and maketh the body insensible for a time. I dare not prescribe the quantity to be taken at a time; for onely such as are skillfull in the work, must meddle with such edged-tools.

I shall not need to meddle with such Mandrakes as are spoken of in the Scripture, for that I am sure we know not where to find them; but I have read of another sort of Mandrake which is said to have the perfect resemblance of a man or woman, and as some write, have life before they are found, (but he must be a better Philosopher then my self that believes it.)

The *Merchasite* is a stone, participating with the nature of Merchasite. some mettals, yet in so small a quantity, that the mettals cannot be melted from it, but will vapour away in smoak, the stone turning to ashes. These Merchasites are commonly in colour like the metal mixed with them, whether it be Gold, Silver, or other metal mixed with them; some affirm a Merchasite to be any stone out of which fire may be struck.

Mummi is more like unto Pitch then Rosin, and is sold by the Apothecaries, (I would not bring any in dislike thereof, for that it is approved to be good and wholesome.) Some do affirm that it is taken out of old Tombs, being a corrupted humour that droppeth therefrom embalmed bodies; others say it is now made of mans flesh boiled in pitch: but this I am sure of, that it is hot in the second degree, and good against all bruises, spitting of blood, and many other inward diseases. Mummial

Myrobalans.

Myrobalans is a fruit growing in Ægypt and Syria, like Plumbs or Damsons. There are five kinds thereof, distinguished by their names, *Citrina*, *Inda*, *Cepula*, *Emblica*, and *Bellerica*. They are cold in operation, and comfortable to nature; the first of these purgeth Choler, the second Melancholy, and the three last Phlegm. Some write of a Gum proceeding from the tree; but in regard I find no vertue in it, I may as well pass it by, as I shall the Gum that cometh out of our English Plumb-trees.

Myrrh.

Myrrh is a Gum brought out of Arabia and Affrica, of colour between white and red: it is hot and dry in the second degree, or as some write in the third, and is often used in Physick, being of an opening, clensing, and dissolving nature. Poets feign that Myrrh first came by reason of a Kings daughter, named *Myrrha*, who for a grievous crime committed, was by the Gods turned into a little tree, and out of the branches thereof this Gum still droppeth in the manner of tears, as a token of her repentant sorrow.

Niter.

Niter is a substance which commeth near to a Mineral; it is distilled out of the earth, and is a substance like salt, but sometimes of a lighter red colour. It is hot and dry, of a strong fretting nature, very near unto salt-peter. There is an excellent fruit of this name, very hot and strong: A drop or two thereof is very excellent against some diseases, taken in a proportion of Beer, or some other liquid substance.

Olibanum.

Olibanum is the right Frankincense, and is a Gum growing in Arabia, whereof there are two kinds; the female and smaller Frankincense, and the male or greater Frankincense, whiter and stronger; of which *Virgil* speaketh, *Eclog. 8. Burne Vervine, fat and strong Frankincense, &c.* It is hot and dry, and good for perfumes to correct infection, and to put in plaisters for green wounds. The weight of two or three wheat corns swallowed down doth help digestion, and maketh the breath sweet; where note that the right Olibanum or Frankincense will burn like a candle, and that which is counterfeit consume away in smoak.

Opopanax.

Opopanax is a Gum, sap, or liquor, flowing in some hot countreys out of a plant called Panax, it is brought hither dry, being of a yellow colour on the out side, and white within; if it be not over stale, it is good against cold shiverings of Agues, and to be drunk with Mead of such as are squat or bruised, but in other griefs, I rather

ther comend the taking inwardly of *Mithridate*, which is a great confection somewhat like *Treacle*, invented by King *Mithridates* from whom it taketh the name; it is of singular vertue against poyson, and hath so many and strong simples in it, that it ought not to be taken inwardly before it be six moneths old, and then it will expel any evil thing from the heart; yet if one be weak and in a Consumption, I shall rather commend that which is strengthening and healing for the lungs, for which I find *Oringoes* very profitable; and these *Oringoes* are certain roots growing in some places near the Sea-side: The plant is called *Sea Holly*, bearing prickley broad leaves, and round sharp prickley heads, set about with small sky coloured flowers. These roots are very long and deep in the ground, of an ashy colour on the outside, and full of joynts; you must scrape off the outward rind, and pick out the pith, and preserve them with sugar or honey, a little Cinamon and Ginger, and it is very good for aged people, and such as be consumed in their bodies to nourish them again.

Pimpinchi is a milkie Gum or juyce, drawn out of certain *Pimpinchi* trees in India; it is thick and clammy, and purgeth Choler with great vehemency; but that which is more commonly used to purge this humour, is called *Diagridium*: For there is a plant called Scamony, growing in far hot countreys, the juyce whereof being dryed, is a very strong and purgative medicine, called also Scamony, which before it can be used in Physick, must be boyled in Quinces, to abate the malice of it, and the Scamony boyled and prepared in this sort, is called by the Apothecary *Diagridium*.

Sagapernum is the sap or Gum of a plant growing in Media, of a yellowish colour without, and white within: It is hot and dry, of a strong smell like Garlick, and is used in Physick against divers cold diseases, but hath some malignant faculties, therefore I rather commend unto you *Dialacca*, which is a confection made of Gum *Lacca*, which is also good against all cold diseases, and the stopping of the Liver, and all other causes that may bring a man into a Dropsie. And whilest I am speaking of Medicines good against cold distempers, I cannot omit the mentioning of *Diagalanga*, which is a confection made of Gallinal and hot spices good against the wind-Collick, and other such like distempers in the inward parts.

Sercocolla. *Sercocolla* is a Gum brought out of Persia, which is red and bitter in taste; it is of a healing nature, and therefore often used to close up wounds, and fill corrupt Ulcers with new flesh; for which cause it is named in Greek *Sarcocolla*, which signifieth a glewer, or healer up of the flesh, therefore it is better to be applied to a cut presently done, before it wrangleth, then to a bruise or old grief.

Stechadoes. *Stechadoes* is a beautifull herb, bearing fair knobs or ears, which being boiled and drunken, doth open the stoppage of all inward parts, and is good against the pain of the head, and diseases of the breast. There is a Gum naturally congealed hereof, but it is more rare then usefull.

Tacamahaca. *Tacamahaca* is a Rosin brought out of the West Indies, of great vertue against any cold humour, rising of the Mother, tooth-ach, and divers other griefs.

Camphire. *Camphire* is a kind of Gum or Rosin which is cold, and therefore easeth pains of the head, proceeding of heat. A little quantity thereof is often used in oynments, as in *Flos unguentorum* and others; it being dissolved, some make use thereof (especially women) against the redness of the face, Morpheus and spots. But as to the latter, I do commend Oyl of Torter, which may safely be used in Smal. pox, after they shool off; for with good effect I have seen the experience thereof, both in taking away the spots, and closing up the places pitted.

lemi. Gum *Elemi* is exceeding good for fractures of the scull, as also in wounds, and therefore is used in plaisters for that end, in Aesculus his linament, which is well known to the learned, and if the scull be broken it ought not to be handled by them that are unskilfull.

Perrosin. *Perrosin* is the purest of the Rosin before spoken of, and sweetest in smell; both the *Rosins*, *Frankincense*, and *Storax* are commonly used together in salves or oynments. The fir tree affordeth plenty hereof, if you take him in his natural soil. In Herefordshire near unto Lempster, I have seen many trees, which are vulgarly called firr trees; but they are of another nature, coming nearer to the Pine, out of which, if you cut but off a branch near the stock, there issueth forth plenty of juyce, which some of the people there call Rosin, others call it Turpentine, and in tryal I have found it in operation betwixt both, though in effect weaker.

Styrax

Styrax Calamintis, is good against coughs and distillations *Styrax*, upon the Lungs; it is the like in operation as *Diacodium*, and sometimes one it used for the other, which the Apothecaries call *Quid pro quo*; but in some cases it may not be profitable for the patient.

Castoreum, is good against poison, and the biting of venomous beasts; it expels wind, eases aches and convulsions, the smell of it allays the fits of the mother; taken inwardly, it helps tremblings, falling sicknesse, and other such effects of the brain and nerves. a scruple is enough to take at a time, and the spirit is best of all. Had I leisure, I would write a larger treatise of roots, herbs, plants and fruits, which are but little known except among skilfull practitioners. The thing would be of excellent use, I can now onely give you a hint of what in time may be enlarged, by my self, or a more able pen.

There is a root brought out of the West Indies called *Carolo Sancto*, of a pleasant smell and bitter tast. The rind whereof being chewed in the mouth, draweth down flegm and humors from the head, and being taken in powder in wine, is good against divers inward diseases.

Casia is commonly taken for *Cinamon*; Poets understand of ten by it some sweet herb, as in *Virgil*.

Tam Casia atque alijs intexens suanibus herbis,

Also *Ovid*, *Quod limus ad Casias & marde lenis aristas,*

Quassaque cum sulva substravit Cinama myrrha.

Lactantius also: de *Phenice*.

Cinamomum de hinc, auramque proculspirantis amomi,

Congerit & munda Balsama cum folio.

Non Casia mitis, nec olentis vimen acanthi.

Nec thuris Lacryma, guttaque pinguis abest.

Where we see that it signifies two things, *Casia* and *Cinamon*. Some think it to be *Lavender*; for my own part I know not what English name to give it, but I am sure that *Casia signea*, is a sweet wood, much like *Cinamon*, and of the same nature.

Coca, is an herb growing in *India*, the leaves whereof being bruised or mixed with the powder of Cockles, or Oysters in their shells burnt, the Indians make it up into little bals, and carry them in their mouths, to preserve them from famine, or great drought.

There be two sorts of *Coral*, the one white, and the other red, but

Coral.

but the red is best, it grows like a tree in the bottom of the sea, from whence being taken, is by the air hardned in the form of a stone as we see it; it is cold and dry in operation; good to be hanged about childrens necks, as well to rub their gums, as to preserve them from the falling sicknels; it hath also some special sympathy with nature, for the best Coral being worn about the neck will turn pale and wan if the party that wears it be sick, and comes to its former colour again, as they recover health.

Cerach.

We have growing in England upon rocks on the sea coast, and upon the decayed wals of some old Castles, an herb called *Cerach* or *Fingerfern*, which hath neither stalk, flower, nor seed (no more hath *Liverwort*) it is much used in Physick against the black Jaundies, quartane agues, and stopping of the spleen.

Senai.

Sena, is a little plant growing in Italy and other hot countries, but the best is brought from *Alexandria*; it is hot and dry, and the leaves often boiled in Physick to purge the body of melancholly, grosse humours, and to cleanse the blood; but there must be *Aniseeds*, *Cinamon*, or *Ginger* added to it, for that otherwise it will provoke windiness or griping in the guts.

Sebestens.

Sebestens are little plums brought out of *Italy*, of a blewish colour and sweet tast; they are cold and moist in operation, and are often used by the best Physicians in hot agues, and inward inflammations of the body.

Mechoacan.

Mechoacan is a whitish root brought out of *India*, called by some, *Indian* or *white Rubarb*; it is hot in the first, and dry in the second degree, and purges all humours of what kind soever with much ease; it cleanseth and comforteth the liver, and all the inward parts.

FINIS

